2020 Annual Operations Review

Turlock Irrigation District
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Introduction

Purpose

In May 1986, the Turlock Irrigation District (the District or TID) issued $53,320,000 in Revenue Refunding Bonds, 1986 Series A. These bonds were issued pursuant to Resolution No. 86-164 adopted by the District’s Board of Directors on May 20, 1986. Under Section 714.4 of Resolution No. 86-164, the District agrees to file with the Fiscal Agent annually “…a report prepared by the Consulting Engineer discussing and commenting on the operations of the System by the District for the preceding Fiscal Year and containing such recommendations for the future operations of the System by the District as may be deemed necessary or appropriate.” Section 101.1 of Resolution No. 86-164 defines the System as all facilities, works, properties, and structures of the District for the generation, transmission, and distribution of electric power; for the collection, control, storage, treatment and delivery, and distribution of water; and for any lawful purpose of the District, except for any separate, non-competing utility (improvement districts) that the District elects to finance. We have prepared this report for the District to accomplish the purposes of Section 714.4 of Resolution No. 86-164.

The District

The District is an irrigation district organized in 1887 under the provisions of the Wright Act (California Water Code §20,500 et seq.). The District supplies water for irrigation use in a 307.5-square-mile irrigation service area lying within portions of Stanislaus and Merced counties, California. Irrigation service began in March 1900 and the District has provided continuous service ever since.

The District provides electric service in a 662-square-mile service area that includes portions of Stanislaus, Merced, and Tuolumne counties, California. The District also has the right to serve an additional twelve-square-mile area of undeveloped land in Tuolumne and Mariposa counties (Don Pedro South Shore Zone). To provide electric service, the District owns and operates an electric system that includes generation, transmission, and distribution facilities. The District also purchases power and transmission service from others and participates in other utility power supply and transmission arrangements. The District employs approximately 443 people to conduct its irrigation and electric business from its general offices located in Turlock, California.

Management

The District is governed by a Board of Directors; its five members represent separate divisions of the District for staggered four-year terms. The following table shows the names, occupations, and terms of the current Directors.
The Board appoints a General Manager and CEO who is responsible for the operations and administration of TID.

- Michelle Reimers, General Manager and CEO

Michelle Reimers was appointed General Manager by the TID Board of Directors in January 2020. Under the policy-setting guidance of the District's elected Board, she directs the day-to-day operations of the District's extensive irrigation water storage and delivery system, as well as the generation, transmission and distribution of electricity within a 662 square-mile service area in central California.

Reporting to Mrs. Reimers are the Chief Operating Officer, Director of Human Resources, Director of Water Resources and Regulatory Affairs, Customer Service Department Manager and the External Affairs Department Manager.

Michelle Reimers joined the District in August 2006. Prior to her current position, Mrs. Reimers served as the District's Assistant General Manager of External Affairs. In those capacities, Mrs. Reimers was responsible for managing the strategic planning and development for the District's communications, outreach, education and government affairs programs and initiatives. Mrs. Reimers regularly advised the General Manager on matters of public policy and provided counsel regarding the District’s opportunities and threats. Mrs. Reimers was also responsible for the scoping, planning and implementation of high-profile projects such as: full redesigns of TID’s external and internal websites, the District’s first ever power online outage notification system for customers and the District’s 125th Anniversary Celebration and award-winning commemorative documentary film *The Irrigationist*. Mrs. Reimers holds a Bachelor of Arts degree in Organizational Communications from California State University Stanislaus and graduated Magna Cum Laude. Mrs. Reimers was appointed General Manager and CEO in January 2020.

- Brad Koehn, Chief Operating Officer

Brad Koehn was appointed Chief Operating Officer in January 2020. He is responsible for overseeing the District’s day to day operations. Reporting to Mr. Koehn are four Assistant General Managers. Each Assistant General Manager has business unit responsibility in civil engineering and water resources, power supply, financial services, as well as electrical engineering and operations.

Mr. Koehn is responsible for the long-term development and management of strategic solutions to the District’s day to day operations. Under general direction from the General Manager, Mr. Koehn is responsible for establishing the vision and strategy to
lead the District in the execution of critical and transformative operational strategic initiatives, while maintaining engineering and operational excellence, and managing the overall operation to ensure financial strength, operating safety and efficiency.

Mr. Koehn has over 20 years of experience in the engineering field. Prior to working at the District, Brad spent 16 years in private practice engineering, most recently co-owning a local civil engineering firm. In 2011, Mr. Koehn joined TID as the Civil Engineering Department Manager where he was responsible for the planning, design, and project management of many capital improvement, water-use efficiency, and irrigation automation projects.

Mr. Koehn is a licensed professional engineer and land surveyor in the State of California. He has a long heritage in the local area and has deep ties to Turlock and the surrounding agricultural community. He is active in the community and volunteers his time as a director on two local boards. Mr. Koehn was appointed Chief Operating Officer in January 2020.

- **Manjot Gill, Assistant General Manager, Electrical Engineering and Operations**

  Manjot Gill joined the District in September of 2006 and was appointed to his present position of Assistant General Manager, Electrical Engineering and Operations in June 2017.

  Mr. Gill directs the planning, design and operation of the District’s transmission lines, distribution lines, substations, and communications systems. He also manages various technical studies and oversees coordination with the District’s large industrial and commercial customers in the design of new electric service facilities.

  Prior to his current position, Mr. Gill held the position of Electrical Engineering Department Manager of Smart Grid and Standards and was responsible for District Metering, Electrical Standards, Solar Applications, Joint Pole, Electrical GIS, and large capital projects. During his career with TID he has also worked on several transmission line projects and designed distribution facilities for large industrial and commercial customers.

  Mr. Gill is a graduate of California State University, Sacramento with a Bachelor of Science degree in Electrical and Electronic Engineering. He is also a Licensed Professional Electrical Engineer in the State of California.

- **Dan Severson, Assistant General Manager, Power Supply**

  Dan Severson was appointed Assistant General Manager, Power Supply in 2020. He is responsible for managing the District’s internal and external power generation and supply resources, day-ahead/hour-ahead energy trading and scheduling, energy settlements and various interactions with the California Independent System Operator (CAISO), the California Energy Commission (CEC) and the Federal Energy Regulatory Commission (FERC). Mr. Severson also oversees the permitting, licensing, design, construction, operation, and maintenance of power generation and related facilities.

  Mr. Severson is responsible for the long-term development and management of strategic solutions to the District’s power supply. This includes renewable energy and greenhouse
gas emission mandates, wholesale electric and gas transactions, wholesale transmission agreements, risk management in economic modeling, load forecasting.

Mr. Severson holds a Bachelor’s degree in Energy Management from Bismarck State College, and has served in a variety of capacities for the District including Government and Regulatory Affairs, Resource Planning, Portfolio Optimization, Contracts, and Environmental Compliance.

- Brian Stubbert, Assistant General Manager, Financial Services and CFO

  Mr. Stubbert joined TID in December 2017. Mr. Stubbert is responsible for planning and directing all of TID’s financial, information technology, risk and insurance, fleet and plant services, risks and rates, security and emergency preparedness, and materials management activities. He performs critical analysis on both internal and external events, providing recommendations to the General Manager and Board of Directors. His tasks include developing and improving cost controls and maintaining good credit standing for the District.

  Mr. Stubbert has more than 25 years of financial experience in accounting, budgeting, working with auditors and with Boards of Directors. Most of his financial expertise was developed during his tenure within the San Joaquin Valley and its diverse agriculture industry.

  Mr. Stubbert is a graduate of California State University, Stanislaus, a member of the American Institute of Certified Public Accountants, and most recently served at Merced Irrigation District where he was the Chief Financial Officer.

- Tou B. Her, Assistant General Manager, Water Resources

  Tou Her joined TID in May 1997 and was appointed to his present position of Assistant General Manager, Water Resources in January 2013. He is responsible for the Civil Engineering, Water Distribution, Construction and Maintenance, and Hydrology departments, in addition to overseeing the Don Pedro Recreation Agency.

  Prior to his current position, Mr. Her served as the Civil Engineering Department Manager, and was responsible for irrigation capital planning, engineering, and project management, irrigation geographic information system and Supervisory Control and Data Acquisition (SCADA), inspection of dams and other irrigation infrastructure, and survey/right-of-way. He has also managed many complex projects during his tenure at TID, including the Canal Office parking structure expansion and solar energy generation system, Walnut Energy Center’s (WEC) water treatment plan microfiltration, and the civil design of many electrical substations.

  Mr. Her holds a Bachelor of Science degree in Civil Engineering from California Polytechnic State University, San Luis Obispo. He is a licensed professional civil engineer in the state of California, and an alumnus of the California Agricultural Leadership Program (Class 45).
Irrigation System

The District’s irrigation system begins at La Grange Dam on the Tuolumne River. The District and the Modesto Irrigation District (Modesto) jointly own La Grange Dam. At the time of its completion in 1893, La Grange Dam was the highest rock-filled masonry dam in the United States. La Grange Dam diverts Tuolumne River water into the District’s Upper Main Canal for conveyance to Turlock Lake, which acts as a regulating reservoir, and hence to the canal distribution system near Hickman on the eastern edge of the District’s irrigation service area. Located 3.5 miles upstream of La Grange Dam is the Don Pedro Dam.

The Don Pedro Project was built and is jointly owned and licensed by the District (68.46 percent) and Modesto (31.54 percent). The District is the managing partner and operator. Don Pedro Reservoir contains 2,030,000 acre-feet (ac-ft) of storage at its normal maximum elevation of 830 feet, approximately 1,720,000 ac-ft of which is usable storage. Construction of Don Pedro Dam began in 1967 and commercial operation of the powerhouse began in 1971, when the first of the three units was complete; a fourth unit was completed in 1989.

Federal Energy Regulatory Commission Licensing for Don Pedro and LaGrange

The Don Pedro Project operates under a 50-year license granted in 1966 by the Federal Energy Regulatory Commission (FERC) to the Turlock and Modesto Irrigation Districts (Districts). The original license extended through April 30, 2016, but FERC has been issuing an annual license to the Districts to continue operating until the new license is finalized. The Districts initiated the process to relicense the Project using FERC’s Integrated Licensing Process in 2010 and are using a consultant to manage the process. Relicensing is an intricate, lengthy undertaking, which will stretch over several years and is open to public participation.

A Final License Application (FLA) for the Don Pedro Project was filed with FERC in April of 2014; however, in 2015, it was ruled that the La Grange Dam was also under FERC jurisdiction. On October 11, 2017, an Amended FLA (AFLA) was filed for Don Pedro and a FLA was filed for La Grange. Costs for the Tuolumne River Management Plan for Don Pedro are estimated at $77.5 million for capital, $57.5 million for operations and maintenance, and $22.9 million for environmental monitoring for a total of $158 million. La Grange costs include $710,000 for capital, and $60,500 for operations and maintenance for a total projected cost of $770,500.

FERC issued their Ready for Environmental Analysis (REA) on November 30, 2017, after they reviewed the approximately 6,000 pages of filings. Interventions, comments, recommendations, and terms and conditions were due by January 29, 2018, with reply comments to those filings due by March 15, 2018. FERC issued the Draft Environmental Impact Statement (DEIS) to jointly address the Don Pedro and La Grange projects on February 11, 2019.

On July 7, 2020, FERC issued the Final Environmental Impact Statement (FEIS). Two issues are still pending before a new License can be issued. First, the California State Water Resources Control Board (SWRCB) has to issue a 401 Water Quality
Certification (WQC). The SWRCB is also the agency that issued a Substitute Environmental Document (SED) in 2018, as part of the Bay Delta Plan Update (BDP); this SED is discussed in greater detail below under Water Resource Management. In summary, the BDP requires additional unimpaired flows be released, primarily in the spring runoff period; many agencies are working toward developing a Voluntary Settlement Agreement (VSA) that would include a number of flow and non-flow measures that act as an alternative to the flow-centric provisions of the BDP. Second, the National Marine Fisheries Service (NMFS) still has to finish its consultation on the AFLA under the Endangered Species Act; they have stated that they cannot do this until the SWRCB issues its WQC. Throughout 2020, District staff continued to communicate with these Agencies to resolve these outstanding issues.

Dams and Associated Facilities

The scope of TID’s dam safety program is summarized in the Owners Dam Safety Program (ODSP), which was originally created in 2012. The purpose of the ODSP is to highlight the importance of dam safety within the organization, establish communication protocols, and clearly define the roles and responsibilities of those parties who are accountable for dam safety. FERC developed an Owners Self-Assessment Evaluation in 2007. It states that the scope of the ODSP “should be commensurate with the size, type and complexity of the owner’s dam(s). There is no ‘one size fits all’ dam safety program.” The primary responsibility for dam safety lies with the Chief Dam Safety Engineer (CDSE). The ODSP was filed with the FERC on October 20, 2014, and there have been only minor revisions.

On August 7, 2020, a Virtual Functional Exercise was performed, with staff from the District as well as local, state and federal regulatory agencies in attendance. It was led by the District’s head of security and is a 5-year FERC requirement. District staff stated that they were given positive feedback by the various governmental agencies on its implementation.

On December 15, 2020, the CDSE made a presentation to the Board of Directors reviewing the ODSP, which covers 28 dams and dikes, and stated that “All TID dams remain in acceptable condition for continued operation.” The Board of Directors unanimously adopted Resolution 2020-57 stating “that TID reaffirms its ongoing commitment to dam safety and the expectations for those parties responsible for dam safety as described in the Owner’s Dam Safety Program for the Don Pedro, La Grange, Turlock Lake, Upper and Lower Dawson, and Hickman dams.”

In 2020, the budget for Don Pedro and La Grange dam safety Operations and Maintenance (O&M) was $1,166,857 for 2020 and is $957,920 for 2021; these costs are split between the District and the Modesto Irrigation District. The 2020 budget for O&M at Dawson, Turlock Lake and Hickman was $215,497 and is $331,434 for 2021. Dam safety O&M projects include routine maintenance such as vegetation and rodent control and other minor repairs, dam safety engineering staff labor, instrumentation readings, DSOD fees, and consultant/outside services (mainly studies, inspections and assessments).
In 2020, the budget for dam safety Capital Projects totaled $1,453,000. The completed projects include the Instrumentation Prisms and Level at Don Pedro and the Headgate Trail Relocation at La Grange. Projects still in progress include the La Grange Tailrace and Sluice Project, the Don Pedro Phase 2 Spillway Buoy Modifications, and the Turlock Lake Dam Rehabilitation Design.

The 2021 Capital budget totals $1,107,750 and includes the following: $117,750 for fencing at Lake; $15,000 for concrete repairs at the Hickman spillway; $200,000 for Upper Dawson Dam Spillway Gate Improvements; $25,000 for Lower Dawson Dam 2 Access Improvements; $750,000 for design of the Turlock Lake dam rehabilitation project (some of which is carryover from 2020). $230,000 was budgeted again for the La Grange Tailrace and Sluice Project that had been delayed.

For the period 2022-2026, the anticipated budget for dam safety O&M will be between $1,000,000 and $1,500,000 annually, and the anticipated budget for Capital Projects will be between $50,000 and $1,000,000 annually.

SB 92 was enacted in 2017 and required inundation maps and Emergency Action Plans (EAPs) for all dams designated by the Department of Water Resources’ (DWR) as anything but a low hazard; this information then needed to be submitted to the Office of Emergency Services (Cal-OES). The inundation maps for the Don Pedro dam, dikes and spillway structure were approved by the DWR Division of Safety of Dams (DSOD) on December 14, 2018; the maps and EAPs were submitted to the Cal-OES on December 20, 2018. There have been several rounds of comments and the EAP is still under review. The inundation maps for all of Turlock Lake’s dams were submitted to the DSOD on September 28, 2018, and were approved on September 29, 2020. Cal-OES reviewed the 2016 Turlock Lake EAP and submitted their comments to the District on November 25, 2020. A response to those comments is in progress. DSOD changed their designation of the La Grange dam to “low hazard” on June 10, 2019. Dawson is designated as “low hazard”. No EAP is required for low hazard dams. FERC only requires an EAP for Don Pedro dam and there are currently no outstanding comments on the EAP.

DSOD and FERC have joint jurisdiction over and inspect four of the District’s dams (Don Pedro, La Grange, Turlock Lake, and Dawson) as well as auxiliary features on a periodic basis. FERC also has jurisdiction over and inspects the Hickman project. The District’s CDSE performs dam safety inspections for the dam facilities on a quarterly basis.

The CDSE also performs an internal ODSP audit on an annual basis. External consultants perform FERC Part-12 inspections of Don Pedro and La Grange dams on a 5-year basis, and as needed. The audit of the ODSP was last performed in 2016 by GEI Consultants, Inc. and filed with FERC in March of 2016.

The CDSE inspects the dams and appurtenant facilities on a quarterly basis and utilizes Inspection Checklists, wherein recommendations are defined and then tracked at the next quarterly review. The CDSE issues internal assignments to District staff defining the specific tasks to be performed and deadlines for completion (prioritized based on risk). Many of the recommendations pertain to vegetation removal, repairs, monitoring, and maintenance tasks as well considerations of improvements. The tables below
summarize the dates, agencies, comments, recommendations and conclusions taken from the various agencies’ inspection reports.

**Don Pedro**

In addition to the quarterly District CDSE dam safety inspections noted above, the Don Pedro dam and appurtenant structures were inspected by DSOD staff in 2020. FERC did not perform an inspection in 2020.

### Summary of Don Pedro Inspections

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<th>Staff(s)</th>
<th>Focus</th>
<th>Comments</th>
<th>Statements</th>
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<tr>
<td>2/19/20</td>
<td>TID</td>
<td>Main Dam, Dikes A, B, C, Gasburg Dike, Powerhouse, Fixed Wheel Gatehouse, Spillway, Diversion Tunnel Outlet Works</td>
<td>Zero action items related to potential failure modes</td>
<td>“Based on the visual inspections performed, the dam and appurtenant structures remain in acceptable condition for continued operation.”</td>
</tr>
<tr>
<td>3/20/20</td>
<td>CDSE</td>
<td></td>
<td>Thirteen Maintenance related action items (three from 2019 and one from 2018, as taken from 12/14/20 report)</td>
<td></td>
</tr>
<tr>
<td>6/16/20</td>
<td>DSOD</td>
<td>Observations and Comments on the Dams, Spillway, Outlet, Seepage, and Instrumentation</td>
<td>Thirteen Monitor Items Seven Items to Consider</td>
<td>“From the known information and visual inspection, the dam, reservoir, and all appurtenances are judged safe for continued use.”</td>
</tr>
<tr>
<td>9/8/20</td>
<td></td>
<td></td>
<td></td>
<td>“The Division is currently reviewing the spillway assessment comment responses provided by TID in a transmittal dated November 7, 2019.”</td>
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<tr>
<td>12/14/20</td>
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<tr>
<td>6/16/20</td>
<td></td>
<td></td>
<td>Inspector notes include (1) remove vegetation growth 5 feet beyond the left and right downstream groins and toe of the dams, (2) increase rodent control efforts on Dikes B, C and Gasburg Dike, and (3) request a 10-year long-term plots in future instrumentation reports for the seepage weir data.</td>
<td></td>
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<tr>
<td>6/24/20</td>
<td>Dam Personnel</td>
<td>5.8 Earthquake in Lone Pine was felt at TID’s upper yard at 10:40 am. Inspections completed at Top of Dam (11:15 am), Bottom of Dam (11:12 am) and Powerhouse (11:30 am). Email sent to CDSE stating “All is stable and normal.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8/10/20</td>
<td>DSOD</td>
<td>Spillway Gates</td>
<td>Gate 1 was cycles 13.5 feet Gate 2 was fully cycled Gate 3 was cycled 4.5 feet</td>
<td>“No problems were encountered during the gate operations.”</td>
</tr>
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</table>

**La Grange**

As the District is proceeding with the licensing of the La Grange dam, specific analyses and inspections have been required. On June 23, 2015, FERC granted an exemption from filing an Emergency Action Plan (EAP). However, FERC also concluded there is a significant hazard potential classification due to water supply. The District filed
additional information with FERC to support the District’s position that this dam has a low hazard potential classification. FERC submitted a letter to the District on February 3, 2021 that made the determination of Significant hazard potential based on potential economic and environmental consequences even though no life loss would be expected.

The second Part 12 Independent Consultant 5-year safety inspection of the project was initiated in 2019 and completed in 2020; the final report was submitted to FERC on July 7, 2020. The report included 21 recommendations, most of which were related to documentation updates, inspection procedures, and minor maintenance. A dam stability analysis was recommended to be performed, which is planned for the year 2022.

The diversion tunnel was dewatered and inspected in 2017 and 2019 and staff stated that there were no issues of concern. District staff indicated that there are plans to perform an inspection in 2021.

In addition to the quarterly District CDSE dam safety inspections noted above, the La Grange dam and appurtenant structures were inspected by DSOD staff in 2020. FERC did not perform an inspection in 2020.

### Summary of La Grange Inspections

<table>
<thead>
<tr>
<th>Date</th>
<th>Staff(s)</th>
<th>Focus</th>
<th>Comments</th>
<th>Statements</th>
</tr>
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<tbody>
<tr>
<td>2/5/20</td>
<td>TID</td>
<td>Dam, Diversion, Intake Structures, Forebay, Powerhouse, Low Level Outlet, Access Road, EAP Exemption Condition</td>
<td>Zero action items related to potential failure modes Eight Maintenance related action items (two from 2019 and one from 2018, as taken from 12/9/20 report) Seven Monitor Items One Item to Consider</td>
<td>&quot;Based on the visual inspection, the dam and appurtenant structures remain in acceptable condition for continued operation.&quot;</td>
</tr>
<tr>
<td>6/29/20</td>
<td>DSOD</td>
<td>Observations and Comments on the Dam, Spillway, Outlet, Seepage, and Instrumentation</td>
<td>A safety anchoring system was installed on the dam crest, and TID &quot;needs to perform a crest inspection within the next 3 years or before December 31, 2023.&quot; The sluice gate was cycled and &quot;it operated satisfactorily.&quot; &quot;Minor amounts of vegetation were present along the concrete crest and right abutment of the dam&quot; and were requested to be removed.</td>
<td>&quot;From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.&quot;</td>
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</table>
Dawson

FERC regulates this project’s powerhouse and appurtenant structures, whereas the DSOD regulates the two embankments. This project has a low hazard potential classification based on visual inspection. FERC’s last inspection was in April of 2014, at which time their report concluded, “Based on observations made and discussion held during the inspection, the project was being operated according to the Order Issuing Exemption dated November 10, 1980 and no major safety concerns were noted.” DSOD staff performed an inspection in 2020.

In the Spring of 2020, it was noted that an issue could arise when the power generator trips and the height of the water rises behind the earthen embankment. This potential risk was identified and mitigations were enacted; the Power Control Center is directed reduce flows upstream and a small automated sluice gate was installed to allow flows to occur around the powerhouse.

Summary of Dawson Inspections

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<thead>
<tr>
<th>Date</th>
<th>Staff(s)</th>
<th>Focus</th>
<th>Comments</th>
<th>Statements</th>
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<tbody>
<tr>
<td>2/5/20</td>
<td>TID</td>
<td>Upper Dam, Spillway, Powerhouse, Lower Dams</td>
<td>Four action items related to potential failure</td>
<td>&quot;Based on the visual inspections, the embankments and</td>
</tr>
<tr>
<td>6/29/20</td>
<td>CDSE</td>
<td>#1 &amp; #2, EAP Exemption Condition</td>
<td>modes</td>
<td>appurtenant structures remain in acceptable condition for</td>
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<tr>
<td>9/23/20</td>
<td></td>
<td></td>
<td>Nine Maintenance related action items</td>
<td>continued operation.&quot;</td>
</tr>
<tr>
<td>12/9/20</td>
<td></td>
<td></td>
<td>(two from 2019, as taken from 12/9/20 report)</td>
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<td>Fourteen Monitor Items</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>One Item to Consider</td>
<td></td>
</tr>
<tr>
<td>6/29/20</td>
<td>DSOD</td>
<td>Observations and Comments on the Dams,</td>
<td>Inspector noted that “aggressive rodent</td>
<td>&quot;From the known information and visual inspection, the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spillway, Outlet, Seepage, and</td>
<td>control measures at both dams are … keeping</td>
<td>dam, reservoir, and the appurtenances are judged safe for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instrumentation</td>
<td>the rodent population under control.”</td>
<td>continued use.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dam 2: Inspector requested TID “monitor this</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>band of wetness (near the sump pump) and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>contact the DSOD immediately if any change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in condition occurs to this wet spot.”</td>
<td></td>
</tr>
</tbody>
</table>
**Turlock Lake**

FERC regulates the powerhouse and the DSOD regulates the control structure and 18 small earth fill dams filling topographic lows around the lake’s perimeter. DSOD staff performed an annual inspection in 2020. FERC regulates the powerhouse but does not inspect this project.

**Summary of Turlock Lake Inspections**

<table>
<thead>
<tr>
<th>Date</th>
<th>Staff(s)</th>
<th>Focus</th>
<th>Comments</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/22/20</td>
<td>TID</td>
<td>powerhouse, outlet works, dams A thru S</td>
<td>Three action items related to potential failure modes</td>
<td>&quot;Based on the visual inspection, the dams and appurtenant structures remain in acceptable condition for continued operation.&quot;</td>
</tr>
<tr>
<td>6/15/20</td>
<td>CDSE</td>
<td></td>
<td>Twenty-two Maintenance related action items (five from 2019 and one from 2018, as taken from 12/7/20 report)</td>
<td></td>
</tr>
<tr>
<td>9/16/20</td>
<td></td>
<td></td>
<td>Ten Monitor Items</td>
<td></td>
</tr>
<tr>
<td>12/7/20</td>
<td></td>
<td></td>
<td>One Item to Consider</td>
<td></td>
</tr>
<tr>
<td>6/15/20</td>
<td>DSOD</td>
<td>Observations and Comments on the Dams, Spillway, Outlet, Seepage, and Instrumentation</td>
<td>Continue to remove undesirable vegetation during routine maintenance work.</td>
<td>&quot;From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.&quot;</td>
</tr>
</tbody>
</table>

**Hickman**

FERC staff did not inspect this project in 2020. DSOD does not regulate or inspect this project.

**Summary of Hickman Inspections**

<table>
<thead>
<tr>
<th>Date</th>
<th>Staff(s)</th>
<th>Focus</th>
<th>Comments</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/21/20</td>
<td>CDSE</td>
<td>Embankments, powerhouse, spillway, EAP Exemption Conditions, public Safety Plan (PSP) Signage</td>
<td>One action item related to potential failure modes</td>
<td>&quot;Based on the visual inspection, the embankments and appurtenant structures remain in acceptable condition for continued operation.&quot;</td>
</tr>
<tr>
<td>6/29/20</td>
<td></td>
<td></td>
<td>Two Maintenance related action items</td>
<td></td>
</tr>
<tr>
<td>9/16/20</td>
<td></td>
<td></td>
<td>Four Monitor Items</td>
<td></td>
</tr>
<tr>
<td>12/9/20</td>
<td></td>
<td></td>
<td>No Items to Consider</td>
<td></td>
</tr>
</tbody>
</table>
Irrigation Facilities

The District owns and maintains over 250 miles of canals, laterals and drains, approximately 90 percent of which are concrete-lined.

In 2020, the budget for Irrigation Capital improvements was $2.2 million for all projects below LaGrange. These categories of projects include safety/handrails, drain pump rehabilitation, earth resources, upper main canal, drop rehabilitation, gunite resurfacing, canal rehabilitation, flow measurement/SCADA and property/easement acquisition. Gunite resurfacing and drop rehabilitation were prioritized, and $740,000 was spent on gunite and $760,000 was spent on drop rehabilitation in 2020. Actual irrigation capital expenditures for 2020 totaled $2.3 million, due to the inclusion of several important investigations on the canal system including a flow test on the Upper Main Canal and site investigations for a new regulating reservoir on the Ceres Main.

For all projects below LaGrange, the budget for Irrigation Capital improvements is $2.5 million in 2021. For the period 2022-2026, the anticipated Irrigation Capital improvements budget will be between $2.2 and $2.5 million annually.

Significant Capital budget items for other projects within the Water Resources Division of the District in 2021 include $1.4 million for the Domestic Water Project, $750,000 million for the rehabilitation of the Turlock Lake dams, and $550,000 for work to the Harding and Nielson Drain Fish Barrier Projects.

Upper Main Canal to Turlock Lake

The Upper Main Canal (UMC) is the main artery of the entire irrigation system, as it conveys water approximately 8.7 miles from La Grange Dam to Turlock Lake, and thence to the irrigation distribution system. The UMC was constructed at the same time as the La Grange Dam and although it is an aging facility, District staff believes that the modified operation, yearly maintenance and continuous monitoring of its condition keeps it functional and reliable for the District’s purposes. District staff weighs the potential risks versus the estimated costs when assessing changes associated with the system.

In 2020, the District initiated a comprehensive review of the UMC to guide the District’s short- and long- term plans for the UMC. The short-term timeframe (0-5 years) is related to maintaining the UMC for near term safe and reliable operations. The long-term timeframe (5-20 years) is looking at the potential rebuild of parts of the system for long-term safe and reliable operations. This comprehensive review included two parts, a physical UMC facilities assessment and a hydraulic study of the canal, which included operational flow tests and hydraulic modeling.

The District hired Gannett Fleming (an engineering consultant firm) to perform the assessment of the UMC facilities with staff in February 2020 and concluded that the system was safe for continue operations and also safe for the flow test. The flow test was performed on the UMC over three days in September of 2020 to examine various flow conditions and water levels. The UMC was operated incrementally up to 3,000 cfs and there were several issues that arose.
• The culvert at the base of the Morgan Fill exhibited increased leakage during the test. The flume had been reconstructed in 2000, but the inlet/outlet to the flume had cracks and staff assessed that water was leaking through those locations. Patching and guniting of these cracks was performed in the spring of 2021.

• There has been a historical slump in the canal embankment next to the lining at the Snake Ravine, which is just upstream of where the UMC crosses Highway 132. Gannett Fleming staff, who was participating in the observations during the flow test, noted that this section of the canal should be more closely monitored, and District staff did so throughout 2020. In January of 2021, District staff identified a sagging section of the canal’s retaining wall, and upon further investigation discovered that the top nine feet of wall had failed and required immediate replacement. The District worked with a consultant to create an emergency repair plan involving bracing the canal walls to either side of the failure area, removing approximately fifty feet of failed wall, and building a wire fabric, mechanically stabilized earth wall behind the failed wall section prior to constructing a new reinforced gunite wall in the failure area. Staff considers the repaired section to be structurally superior to the adjacent sections of wall. Survey markers have been installed and the wall will be monitored on a yearly basis.

• On the third day of the tests, notable freeboard issues were observed below Lower Dawson Lake.

The District is continuing to examine the results of the flow test to identify areas for improvement in the system. Future flow tests may also be run in 2021.

The District is also in the process of updating its topographical survey of the UMC system as another component of the hydraulic study of the canal system with the intent of creating a modern hydrologic computer model of the system to assist in operations and design improvements related to long term planning for the system. In late 2020, controls were set so that a LiDAR scan can be performed 2021.

District staff inspects the UMC at the end of each irrigation season starting just downstream of the tunnel forebay gates at the La Grange powerhouse and ending at the intake to Turlock Lake. The UMC inspection was done on November 9, 2020. Staff indicated that this effort is for internal information and is not a requirement of any Agency. The majority of the inspection report showed “no apparent deficiencies”.

Beyond the issues discussed above, District staff did note areas needing repairs in the canal lining as well as locations where rocks and dirt need to be removed, and completion dates were also noted. There was a small lining failure adjacent to French Pit that was noted and repaired. A small rockfall was discovered at the portal to Tunnel 1 and was removed. This is the tunnel where an outside contractor had performed scaling in November 2019. District staff provided photos to their consultant who said that it appeared to be a negligible amount of rock, that it is reasonable for additional rockfall after a scaling event, and that the District should plan to perform this task again in another five to ten years.
Operational maintenance staff drive the road adjacent to the UMC two times per day and in any abnormal condition to make observations of its integrity. No reports were issued by these staff after the Lone Pine earthquake that would indicate anything out of the ordinary.

Emergency Procedures for the District’s Canal System were developed in 2009. The purpose was to assist District staff in maintaining the integrity of the system during unusual events such as heavy rainfall or a moderate or major earthquake. Responsible staff and their expected actions are outlined in this document.

In August 2008, a consultant performed a Condition Assessment Study of the Entire Upper Main Canal (UMC). This study stated that the following goals were provided by the District related to the UMC system: no unscheduled repair outages lasting longer than 17 days during the irrigation season under extreme loading such that the canal will remain in service after a major earthquake, and no maintenance outages during the irrigation season. These continue to be the goals of the District. The 17-day period was developed because that is the amount of water that can be contained in Turlock Lake. The consultant of this 2008 study also recommended additional engineering studies be performed to analyze the stability and reliability of the Peasley and Delaney Fills and the upper 7,500 feet of the UMC system as well as some inspection and repair work be performed on the tunnels. Staff considers that this document must be read within the context of how the UMC had operated until 2003, when the flows would typically be pulsed for electricity needs and sometimes reach a maximum of 3,200 cubic feet per second (cfs) without any ramping rate criteria. During that time, cracking, buckling and leaking periodically occurred that then required repairs beyond normal maintenance work. In 2003, the District looked at options to completely reconstruct the UMC; however, due to high costs, the District decided to implement operational criteria to limit the maximum flow in the UMC to 2,500 cfs with ramping rates of 500 cfs/hour. Since the implementation of those operational criteria, District staff have stated that there has been no significant cracking, buckling, or leaking that has been observed nor have extraordinary repairs been required.

There are three major Fills in this section of the UMC: the Morgan Fill, the Delaney Fill, and the Peasley Fill. Staff is directed, for all three fills, to inspect the upstream and downstream entrances and channel after each major storm event or monthly if there are no storms, and to report any adverse information to the Civil Engineering Department. The Morgan Fill was reconstructed in 2000, the Delaney Fill had some crack repairs performed in 2009 and in 2019, and the Peasley Fill had rehabilitation work performed on the flume floor in 2007-08. Since these repairs, the UMC Inspection Reports indicate no significant adverse findings. New crack gauges were installed in 2019 and have shown no movement in 2020.

A sensor that can remotely monitor both high and low water levels in the UMC near the Peasley Fill was installed after the irrigation season of 2014. This sensor functioned throughout 2020 with no adverse findings. This sensor is set to alarm if there is a difference in water elevation of one foot in one hour; various staff are on the call list and it is monitored 24 hours per day. Were this sensor to alarm, staff would access the site within fifteen minutes and could inform the system operator to remotely close the
forebay gates at LaGrange. Staff could then determine the cause of that water level change and then plan whatever action would be necessary. An additional SonTek flow meter was installed at Delaney Fill after the 2018 irrigation season; it functioned throughout the 2020 irrigation season and provided additional data for flow and water levels to the canal tender. An additional water level sensor was installed at Lower Dawson Dam #1 near the outlet into the UMC prior to the September flow test and continues to provide water level readings to the canal tender. Remote cameras were also installed at all telemetry sites as well as the first Lake Road bridge crossing and are accessible to the canal tender.

System below Turlock Lake

The entire irrigation system below Turlock Lake is inspected on an annual basis by at least three individuals with at least one inspector from Water Distribution, one from Construction & Maintenance, and one from Civil Engineering. The entire system is reviewed with particular attention being paid to those areas that have had ongoing issues. This effort takes approximately fifteen days during the non-irrigation season, with one section of canal inspected per day. During these staff inspections, all facets of the irrigation system are rated on their conditions. These inspection ratings are one element that staff uses to prioritize the projects that get placed in the five-year irrigation capital budget. District staff said there have been no significant, unexpected adverse findings.

In October 2020, the District purchased 39.01 acres near the intersection of the Ceres Main Canal and Lateral 3. The intention is to build a regulating reservoir similar to the one built in 2016 at Lateral 8, as it was found to be able to reduce operational spills from the system while adding operational flexibility.

Plans for the Harding and Nielson Fish Barrier Projects were developed in 2019, with the intent of preventing fall run Chinook Salmon from entering the District’s canal system from the San Joaquin River. The Initial Study/Mitigated Negative Declaration was approved on October 22, 2019. Throughout 2020, the District worked with the various regulatory agencies to finalize the necessary permits; the District also received a $517,000 grant from the Department of Water Resources (DWR) to fund the improvements. The Nielson Drain permits have been obtained but the Harding Drain permits are still pending.

Improvement Districts

Growers, in cooperation with the District, have formed more than 1,400 improvement districts to install facilities for the distribution of irrigation water, for pumping, and for drainage purposes. In 2020, 149,269 acres were irrigated within the District, of which approximately 124,000 acres were within improvement districts. At this time, approximately 1,046 of the improvement districts are active. The average improvement district contains 223 acres and includes 12 parcels of land. Any parcel may lie in more than one improvement district. The District loans funds, repayable over a 10-year period, to the improvement districts for construction of their facilities and provides
annual maintenance on a cost-reimbursable basis. There has been an increase in the number of canal sidegates being added; District staff thinks this is attributable to a desired flexibility in where the water is delivered rather than an increase in the number of growers.

Farmers are allowed to transfer, on paper, some of their water between parcels, which they own or rent, within the irrigation season. This allows one field to be fallow and the water that would have been available to that parcel to be diverted to another parcel; for example, from one area that might historically have been planted in row crops to another area that has permanent crops such as orchards. This is particularly important during drought years.

Approximately half of the irrigated acres are for tree crops and the other half are for growing forage crops (alfalfa and corn) for dairies. For tree crops, some farmers have switched their method of irrigation from flood to micro/drip, which has affected how water is taken from the District’s facilities but not in the overall amount of water that is used according to District staff.

Drainage Facilities

The District also operates drainage wells in an effort to influence groundwater levels, particularly on the west side of the District. Where possible, drainage is discharged into the canal system so that it can be utilized for irrigation at other locations. Drainage pumping increased in 2020, 2019 and 2018 as compared to the previous several years.

The canals and laterals also act to collect storm drainage from the City of Turlock. No adverse conditions to the system were noted due to rainfall events in 2020.

Water Conditions

During the 2019-20 Water Year, California and the District experienced a below average water year, with the Tuolumne River computed natural flow at 965,992 ac-ft, or approximately 51.3% of the historic average.

For the 2020-21 Water Year, the Tuolumne River watershed started off dry and has continued to be very dry. Since Water Years are defined for the period from October of one year through September of the following year, forecasts include estimates of future precipitation based on historic averages. The CDWR Water Year forecast on March 1, 2021 was 920,000 ac-ft (48% of the historic average); it included an April through July forecast of 720,000 ac-ft. These CDWR forecasts remained the same on March 25, 2021. Assuming average historic precipitation for the remainder of this Water Year, a runoff of 920,000 ac-ft (48% of historic average) is expected for the 2020-2021 Water Year.

The CDWR uses a 50-year average to calculate an average historic Water Year with the latest period using data from 1965-2015; the resulting defined average historic Water Year for the Tuolumne River watershed was 1,908,596 ac-ft for the Water Year.

For historical comparisons, the wettest year on record occurred in 2016-17, when it was 256 percent of the historic average. Prior to that, the 1982-83 water year was 243
percent of the historic average. The driest water year on record occurred in 1976-77, when it was 18 percent of the historic average.

It should be noted that in the past, this report has referenced “normal” water years; the corrected terminology is now “historic average” water years.

The Tuolumne River hydrology continues to show an increase in volatility, which could have a significant effect on the firm yield potential of the water supply for environmental requirements, water supply and electrical production. When adding this topic to the hurdles of climate change, regulatory requirements and additional demand on the water supply, the District recognized the need to optimize this resource to the highest degree possible. Assessing and utilizing the water supply from the watershed efficiently allows the District to best manage this resource. The following are areas that the District started investing in during 2019 and continued through 2020 to participate in to accomplish this goal.

- **ASO (Airborne Snow Observatory):** ASO technology was developed at the NASA Jet Propulsion Laboratory to map the snow water equivalent (i.e., the volume of water stored as snow) and snow albedo (i.e., the reflection of incoming radiation) completely and accurately across mountain basins by measuring snow depth and snow reflectivity using airplane-mounted light detection and ranging (LiDAR) technology. This work allows the District to get direct measurements of the snowpack at millions of points in the watershed rather than at just 17 points that traditional snow surveys measure in the watershed. With the increase in direct measurements, the overall accuracy of snow water content estimates improved from errors of more than 30% down to an error of less than 3%. By reducing error, water managers can have greater confidence when making decisions to prepare for and control snowpack runoff and assigning reasonable values for irrigation use.

  Of particular interest is the value of this ASO technology is in the projections of available water in 2021. The District contracted with NASA to fly the watershed in February of 2021; due to the reduced snowpack, the anticipated availability will be 34 inches per acre in the 2021 irrigation season unless significant precipitation occurs.

- **Center for Western Weather and Water Extremes (CW3E):** The Center for Western Weather and Water Extremes (CW3E) out of Scripps Institute goal is to improve atmospheric river forecast and provide tools to assist water managers for flood control and water supply decisions. Atmospheric rivers are the key drivers of water supply on the western part of North America. Having this information during flood control periods allows the District to begin communications with the public and outside agencies earlier as well as managing water releases with the increased lead-time. Over the past few years, the District has been integrating CW3E’s innovative products into its decision-making process.

- **HFAM:** HFAM is a physically based hydrologic model developed by Hydrocomp that runs on an hourly time step. The model gives one an understanding of what is happening on every land segment in the watershed and allows water managers to make informed decisions. For over 20 years, the District has been working with Hydrocomp to develop and optimize the HFAM model of the Tuolumne System.
Drought Planning Efforts: Considering that the 2019-2020 Water Year was below normal, the District ramped up its efforts on drought planning. A series of meetings involving many levels of staff from different disciplines of the District took place to discuss, plan, and prepare for the current as well as future drought years. From those discussions, a drought planning matrix was developed to identify categories, actions, and timing necessary to successfully navigate drought years. The matrix included many categories ranging from Board interactions & approvals (policy level discussions and directions), District operations (water resource assessment/analysis/modeling, water availability, water rate schedules, irrigation operations, conjunctive management, and water use efficiency projects and efforts), online tools (online ordering, mobile friendly account access, dashboards, alerts, and forecasting tools), grower assistance programs (pump rental and water transfer programs) and grower communications. The drought planning matrix was utilized to prepare for the 2021 irrigation season and has resulted in many robust planning and preparation discussions, reprioritization and completion of several water use efficiency projects, increased grower communications, and development of an enhanced online water ordering system, just to name a few. The drought planning matrix is a living document and is updated regularly to reflect completed and anticipated actions.

San Joaquin Forecast-Coordinated Operations Grant: The San Joaquin Forecast-Coordinated Operations Program (F-CO Program) is a collaborative initiative among partner agencies for coordinated operation of reservoirs and to collaborate to enhance communications, hydrologic data collection and information exchange, reservoir modeling, and operational training. The San Joaquin F-CO Program partner agencies include U.S. Army Corps of Engineers’ Sacramento District Office (USACE), California Department of Water Resources (DWR), National Weather Service’s California-Nevada River Forecast Center (CNRFC), TID, Merced Irrigation District, U.S. Bureau of Reclamation’s Friant Division Project, Kings River Water Association, and Kings River Conservation District. Each partner agency plays a critical role. CNRFC and DWR work together to provide river and flood forecasts and warning, USACE governs criteria for flood control operations of the reservoir, and reservoir operators participating in the F-CO Program are responsible agencies for the operation of their reservoirs. The District applied for an F-CO project grant for Don Pedro Reservoir, Tuolumne River Forecast Data and System Upgrades, to improve the accuracy of flood forecasting for the Tuolumne River watershed and overall coordination with other reservoir operators in the San Joaquin River watershed.

Water Rates and Operations
A new irrigation rate schedule was adopted in 2015 to address the various projects outlined below in the section titled Water Resource Management. The District’s goals were outlined in their presentation when presenting the proposed rate increase: “protect water rights, maximize water use efficiency (conservation), assure sustainability & reliability of our water resources, and keep future rates reasonable.”
On February 21, 2020, the Board of Directors established that the Normal Water Year Rate Schedule would be used and set an availability of 42 inches per acre. The Board of Directors also allowed for those parcels that needed more than 42 inches of water to produce a crop to complete their last irrigation; it was billed at the appropriate tier.

The 2020 irrigation season began on March 2 and concluded on October 28. During the 2020 season, the District delivered 403,466 ac-ft of irrigation water (based on receipts) to 149,269 acres of land, of which 86 percent came from the Tuolumne River and the remainder from groundwater pumping. Deliveries in 2020 were approximately 1.0 percent higher than in 2019 and approximately 9.0 percent higher than 2018. The amount of water stored in Don Pedro and Turlock Lake increased from 991,947 ac-ft to 1,064,420 ac-ft between 2019 and 2020; this number includes the City and County of San Francisco’s water bank. The District’s portion of that water increased from 582,203 ac-ft to 734,229 ac-ft between 2019 and 2020. None of these values include the dead storage capacity of 309,000 ac-ft of water stored in Don Pedro.

Groundwater pumping, both by District pumps and privately-owned pumps contracted by the District pump, provided a larger than normal portion of the water delivered during the 2013, 2014, 2015 and 2016 irrigation seasons. In the 2017 season, groundwater pumping was one of the lowest on record with 25,477 ac-ft pumped. In 2020, the groundwater pumping was 68,692 ac-ft pumped; according to District staff, though, that value is still low compared to historical pumping. The District pays the well owner a cost per acre foot pumped plus all electricity and maintenance costs. Approximately 100 improvement district and private wells were rented by the District in 2020.

A part of the groundwater basin lying east of and adjacent to the District boundaries is over-drafted as more orchards are being cultivated in this area, and which relies entirely on groundwater for their supply. The overdraft has begun to encroach into the District’s part of the basin causing the groundwater on the eastern side of the District to flow eastward toward the cone of depression. To reduce the overdraft east of the District, the District has made surplus water available in normal and above normal water years to irrigators immediately adjacent to the District facilities but outside the District boundaries. Due to dry conditions in 2020, replenishment water was not available for purchase for lands outside the District’s irrigation service area that are also within the Turlock groundwater subbasin.

The District tracks its water delivery efficiency by dividing the amount of water delivered by the calculated value of total water supply. The total water supply is the sum of the Turlock Lake releases plus the amount of water delivered by District pumps to the canal, either from drainage pumping or from water supply pumping, minus the bypass water. The water delivered is obtained from the accounting receipts for the water purchased by farmers, but it does not account for operational spills out of the canal system that are inherent in any gravity-type irrigation system. System efficiency can thus be calculated in two ways: the first includes the spill as part of the water supply and the second excludes the spill from the water supply. Both efficiencies are included in the following table.
Selected Irrigation Operating Statistics

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1 Turlock Lake Releases</td>
<td>435,798</td>
<td>469,279</td>
<td>510,773</td>
<td>-7.1%</td>
<td>-8.1%</td>
</tr>
<tr>
<td>2 Drainage Pumping (District)</td>
<td>32,541</td>
<td>26,769</td>
<td>26,107</td>
<td>21.6%</td>
<td>2.5%</td>
</tr>
<tr>
<td>3 Water Supply Pumping</td>
<td>36,150</td>
<td>7,266</td>
<td>10,626</td>
<td>397.5%</td>
<td>-31.6%</td>
</tr>
<tr>
<td>4 Bypass (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>5 Total Water Supply</td>
<td>504,490</td>
<td>503,314</td>
<td>547,506</td>
<td>0.2%</td>
<td>-8.1%</td>
</tr>
<tr>
<td>6 Water Delivered</td>
<td>403,466</td>
<td>399,332</td>
<td>370,238</td>
<td>1.0%</td>
<td>7.9%</td>
</tr>
<tr>
<td>7 Efficiency if Include Spill (2)</td>
<td>80.0%</td>
<td>79.3%</td>
<td>67.6%</td>
<td>0.9%</td>
<td>17.3%</td>
</tr>
<tr>
<td>8 Spill</td>
<td>45,724</td>
<td>69,858</td>
<td>78,123</td>
<td>-34.5%</td>
<td>-10.6%</td>
</tr>
<tr>
<td>9 Spills – % of Total Supply</td>
<td>9.1%</td>
<td>13.9%</td>
<td>14.3%</td>
<td>-34.8%</td>
<td>-2.6%</td>
</tr>
<tr>
<td>10 Water Supply minus Spill</td>
<td>458,766</td>
<td>433,456</td>
<td>469,383</td>
<td>5.8%</td>
<td>-7.7%</td>
</tr>
<tr>
<td>11 Efficiency if Exclude Spill (2)</td>
<td>88.0%</td>
<td>92.1%</td>
<td>78.9%</td>
<td>-4.5%</td>
<td>16.8%</td>
</tr>
<tr>
<td>12 Irrigated Land – Acres</td>
<td>149,269</td>
<td>148,996</td>
<td>145,972</td>
<td>0.2%</td>
<td>2.1%</td>
</tr>
<tr>
<td>13 Total Water Stored – ac-ft (3)</td>
<td>1,064,420</td>
<td>991,947</td>
<td>1,358,544</td>
<td>7.3%</td>
<td>-27.0%</td>
</tr>
<tr>
<td>14 TID Water Stored – ac-ft (4)</td>
<td>734,229</td>
<td>582,203</td>
<td>792,284</td>
<td>26.1%</td>
<td>-26.5%</td>
</tr>
<tr>
<td>15 Revenues – $1,000</td>
<td>$9,784</td>
<td>$9,810</td>
<td>$9,771</td>
<td>-0.3%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

(1) Bypass diversions into Tuolumne River near Hickman. The purpose of these flows is to reduce the flow fluctuations in the Tuolumne River between La Grange and Hickman, while allowing more water to be released at Don Pedro for power production. This typically happens in above average water years when Don Pedro does not need to be replenished.

(2) Efficiency can be calculated in two ways. The first method is calculated as the “Water Delivered” divided by the “Total Water Supply” where the “Total Water Supply” includes Spill. The second method is calculated as the “Water Delivered” divided by the “Water Supply minus Spill” where the Spill is subtracted from the “Total Water Supply”. Private groundwater pumping is not accounted for in any scenario.

(3) Total Water Stored includes Turlock Lake and Don Pedro Reservoir (TID active storage which also includes the City and County of San Francisco’s water bank share) as of December 31.

(4) TID Water Stored includes Turlock Lake and TID’s portion of the Don Pedro Reservoir (i.e. it excludes the City and County of San Francisco’s water bank share that is stored in Don Pedro) as of December 31.

(5) The Total Water Supply and Irrigated Land values for 2017 were updated by District staff, which caused other values to change. The values listed in the 2017 Report were 498,643 acre-feet and 146,791 acres, respectively.

Water Quality Regulations

District staff monitor the regulatory environment and participate in proceedings as needed to ensure that the District is prepared for and able to comply with new requirements as they are instituted. District staff stated that there were no significant changes to the various regulations affecting the District in 2020.

In the past, the District developed an internal program to collect and measure the quality of water being discharged into its system from growers. Over time, the District’s role diminished in this venue as the Regional Water Quality Control Board (RWQCB) instituted various regulatory programs. These programs include the Irrigated Lands
Regulatory Program (ILRP), the Confined Animal Facility Program (CAFP), and the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) Program, as well as a myriad set of other oversight issues including but not limited to pesticide management, climate change, and stormwater. The RWQCB is also responsible for developing Waste Discharge Requirements (WDR) on various dischargers and to develop a Basin Plan for the entire region. The District does not have WDRs but it does have a National Pollutant Discharge Elimination System (NPDES) permit for aquatic pesticide use in its canals to minimize algal growth.

The Federal Clean Water Act [Section 303(d)] requires that the RWQCB and the State Water Resources Control Board (SWRCB) maintain a list of impaired waterways. The most recent list for the Central Valley is included in the Final 2014 and 2016 Integrated Report that was submitted to the Environmental Protection Agency (EPA). The current list includes a variety of local waterways. Category 5 criteria includes “a water segment where standards are not met and a total maximum daily load (TMDL) is required, but not yet completed, for at least one of the pollutants being listed for this segment.” There are 1,096 waterbodies on this list. Don Pedro Reservoir and Turlock Lake are listed for mercury, with the source unknown. The SWRCB and the RWQCB are working together on statewide TMDLs for mercury. The lower Tuolumne River, from Don Pedro Reservoir to the San Joaquin River, is listed as impaired for chloropyrifos, diazinon, group A pesticides, mercury, water temperature, and toxicity. The pesticide listings are for chemicals not used by the District, but are used by others in both the urban and agricultural settings.

A Basin Plan Amendment for the RWQCB’s Basin Plan was adopted in 2017, which could enable changes to some of the beneficial uses and, therefore, water quality objectives associated with the District’s canals and irrigation water supplies. The District has maintained that the canal system does not transport or supply municipal water and should not carry the MUN designation, or be required to meet drinking water standards. However, under SWRCB policies, the Basin Plan broadly assigns municipal beneficial uses to all waterways throughout the state unless specifically designated to not be a MUN supply. This broad interpretation of MUN beneficial uses has resulted in several canals being listed as impaired for pesticides to protect these MUN uses. The current Basin Plan Amendment provides a streamlined process to de-designate MUN uses or specify a “limited MUN” use in the future. The District will continue to participate in this process and, if approved, work with the RWQCB to modify canal designations as appropriate to meet current and future needs. De-designating MUN would correct an inaccurate characterization of the canal uses, thereby providing regulatory relief by enabling the removal of some 303(d) listings, and other regulatory requirements in the future, without impacting canal water quality or existing uses.

**Water Resource Management**

The District continues to evaluate and implement a variety of water resources management activities, many of which are mandated by the State. As described below, some of these proposals aim to increase the water that would be released through the
river system whereas others aim for water to be utilized to recharge the groundwater system.

The District has internally developed a Draft Irrigation Facilities Master Plan. Assuming baseline conditions, the intent is to examine levels of service, minimize spills, and investigate canal constraints. Potential outcomes could include additional regulating reservoirs and ties between laterals.

SBx7-7, known as the Water Conservation Act of 2009, required agricultural water agencies to develop Agricultural Water Management Plans (AWMPs). These plans required agencies to review various water management practices, including water measurement and pricing, and then propose improvements to comply with specific planning criteria. Using both permanent and mobile metering systems, District staff developed a database of historical canal conditions and sidegate openings to allow a calibrated flow rating for all active deliveries that are subject to the regulation. During the 2019 and 2020 irrigation seasons, this Sidegate Measurement Project was implemented in conjunction with the billing system to quantify water deliveries.

The District began updating the AWMP in 2020. As with previous AWMPs, the draft 2020 AWMP demonstrates the importance of the District’s conjunctive management programs and practices to support drought management planning, and meet water supply needs within the subbasin. The information developed for the AWMP water budget were used to inform the data and analyses being developed for the Groundwater Sustainability Plan (GSP) required by the Sustainable Groundwater Management Act (SGMA), to ensure consistent data sets for local planning processes.

The District adopted the updated AWMP on March 23, 2021, and will need to submit it to the Department of Water Resources (DWR) by April 22, 2021. Assembly Bill 1668 (enacted in 2018) added several new requirements to the AWMP including developing annual water budgets, identifying water management objectives, and quantifying water use efficiency. These requirements had already been included in the District’s previous AWMP.

Final Substitute Environmental Document (SED)

The State Water Resources Control Board (SWRCB) began working on a Bay Delta Plan Update with a Notice of Preparation in 2009, and in 2012, they issued the Draft Substitute Environmental Document. On July 6, 2018, the State Water Resources Control Board (SWRCB) released the Final Substitute Environmental Document (SED) in support of Phase 1 of the Bay Delta Plan Update. The SED dictates that 40 percent (range 30%-50%) of the unimpaired flow be released each year from the Merced, Stanislaus, and Tuolumne rivers between February 1 and June 30. The SWRCB determined that this amount of flow is needed to support fish and wildlife in the San Joaquin River and its tributaries, as well as to meet salinity objectives to protect agriculture in the southern Delta.

On December 12, 2018, the SWRCB approved the “Adoption of Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document”. Within this Resolution was a
paragraph that “directs staff to provide appropriate technical and regulatory information to assist the California Natural Resources Agency in completing a Delta watershed-wide agreement, including potential flow and non-flow measures for the Tuolumne River, and associated analyses no later than March 1, 2019.” Paragraph 8 of the Resolution states “The Plan Amendments adopted by this resolution are not self-implementing.”

Throughout 2020, District staff were in discussions with various State agencies and other affected public water agencies regarding alternative flow and non-flow measures that could be incorporated into a Voluntary Settlement Agreement (VSA), which would provide an alternative to the flow-centric requirements for the Tuolumne River in the Bay Delta Plan Update. Concurrent with this effort is the Federal FERC relicensing effort.

On January 10, 2019, the San Joaquin Tributaries Authority (SJTA) filed a lawsuit challenging the Phase 1 of the Bay Delta Plan Update. The SJTA is a coalition of water agencies whose members include the District, as well as Modesto Irrigation District, Oakdale Irrigation District, South San Joaquin Irrigation District, and the City and County of San Francisco. The SJTA’s “mission is to promote sound, environmentally responsible solutions to water supply management within a framework that recognizes the historic rights of its member agencies and the concerns of ratepayers.” Throughout 2020, the SJTA and the various state agencies were in discussions.

The SJTA filed another lawsuit against the SWRCB in May of 2019 regarding the SWRCB’s Wetlands Policy. The SJTA won that case at the end of 2020 and the court directed the SWRCB to refrain from implementing its procedures pertaining to its Wetlands Policy until the SWRCB goes through an appropriate public process to adopt its Wetlands Policy. The SJTA continues to monitor the issue to ensure that the SWRCB properly implements the court’s direction.

It should also be noted that the Governor’s Administration is participating in the VSA discussions with the many various water agencies throughout California.

**Sustainable Groundwater Management Act (SGMA)**

The Sustainable Groundwater Management Act (SGMA) was passed in 2014; it enabled local agencies within a subbasin to form a Groundwater Sustainability Agency (GSA). Two GSAs were formed within the Turlock Subbasin and approved by the DWR in 2017: the West Turlock Subbasin Groundwater Sustainability Agency (WTSGSA) and the East Turlock Subbasin Groundwater Sustainability Agency (ETSGSA). The process was coordinated with all the eligible groundwater users to ensure that the entire Subbasin was covered, without overlap, as required by SGMA. The District is a member of the WTSGSA and is coordinating efforts relating to the development of the Groundwater Sustainability Plan (GSP). The first GSP must be submitted for approval to the DWR by January 31, 2022, and then updated every five years afterward.

The WTSGSA, on behalf of both GSAs, received $1 million in Proposition 1 grant funding from DWR in 2018 to aid in developing the GSP. The overall cost to develop the GSP is expected to be $1.68 million, and the remainder of the costs will be split between the GSAs pursuant to a Memorandum of Agreement that was developed in
2017. The WTSGSA also applied for and received Facilitation Support Services (FSS) from DWR to begin developing a communication and outreach approach for the GSP process.

The consultant team continues to work on the GSP development process. Much data compilation was completed to understand conditions within the Subbasin including groundwater basin geology, land and water uses. The information was used to develop and calibrate a groundwater model of the Turlock Subbasin and adjacent areas, which is being used to evaluate the subbasin water budget, project long term trends, and evaluate projects and actions to achieve sustainability by 2042. The technical information will be incorporated into the chapters of the GSP, and used to inform the development of groundwater sustainability goals, minimum thresholds, and other management criteria, as well as what projects might be needed to achieve those goals.

Draft chapters of the GSP are projected to begin to be released in late spring/summer 2021. Over the remainder of 2021, work will continue on the GSP, as the GSAs consider draft groundwater sustainability goals, minimum thresholds and other management criteria, and what project might be needed to achieve those goals.

To assist with the process, the GSAs have formed Technical Advisory Committees (TACs), which meet jointly on a monthly basis, to coordinate SGMA related efforts and provide input to the consultant team developing the GSP. Joint TAC meetings are held pursuant to the Brown Act and provide opportunities for public input into the process. An Outreach Subcommittee has also been formed to assist with SGMA outreach efforts. An updated website was developed in 2019 (www.turlockgroundwater.org) that will grow and evolve along with the GSP development process. Due to COVID, the GSP development process moved to an on-line format, with meetings held via Zoom. This format provides the opportunity to record meetings, providing ongoing documentation of the development process. Meetings are posted on the website and available for stakeholders that may not be able to join a meeting, and enabling stakeholders to engage remotely. Additional outreach is planned for the remainder of 2021 and beyond through use of additional Facilitation Support Services being requested, as well as grant funding and local resources to facilitate additional workshops and continue outreach efforts designed to educate and engage the public in the GSP development process.

In late 2019, the GSAs applied for and received a $1 million Proposition 68 grant to fund installation of monitoring wells, development of a Groundwater Recharge Assessment Tool (GRAT), and enable the development of a Draft Programmatic Environmental Impact Report (PEIR) for the GSP. While environmental review is not required for the GSP, it is required for implementation of action items and potential projects. Having a PEIR in place soon after the GSP is completed will enable the GSAs to be more competitive for future grant funding, which many times require “shovel ready” projects. The PEIR, GRAT and monitoring wells will assist in monitoring and managing groundwater resources, and beginning GSP implementation as quickly as possible.

Once the GSP is adopted and submitted, implementation and Annual Reports begin. The first Annual Report is due in April 2022. The Technical Advisory Committee is
beginning to prepare and plan for the first Annual Report, which includes updates of data from water years 2015-2021.

**Other Plans**

The District participates with various memberships and contracts that work together to achieve favorable legislation, stay informed on pertinent policy and share legal costs.

The District also collects a fund, accrued through the rate structure, to address the additional costs associated with critically dry years. These costs are attributed to increased pumping and lower volumetric revenues.

As stated in the District’s AWMP, “the flexibility offered by access to both surface water and groundwater as sources of supply, TID will continue to pursue a deliberate course of conjunctive management.”

**Domestic Water Supply Development**

The Stanislaus Regional Water Authority (SRWA) is a joint powers authority (JPA) currently comprised of the cities of Turlock and Ceres. The SRWA is developing a Regional Surface Water Supply Project (RSWSP) that will provide safe and reliable drinking water to the cities to supplement their existing groundwater drinking water supplies. While the District is not a member of the JPA, the District is involved as a participant due to the future transfer of water to the SRWA for the RSWSP. The District Board passed a Resolution approving a Water Sales Agreement (WSA) to the SRWA in 2015, which has a 50-year term and defines conditions under which the District will transfer water to the SRWA.

In January 2018, the SRWA circulated for public comment a Draft Environmental Impact Report (EIR) for the RSWSP. The Final EIR was issued in July 2018 and certified by the SRWA Board on August 6, 2018. An initial phase of construction for a raw water pump station was initiated in June of 2019 and completed in March of 2020. The work included a performance test of the infiltration gallery that had been installed in 2001; the infiltration gallery produced better results than expected. All of the easements and property acquisition for the raw water facilities have been acquired.

In June 2018, the District submitted a water transfer petition to the State Water Resources Control Board (SWRCB) seeking approval to transfer 17,375 acre-feet per year of surface water to the SRWA for the RSWSP using its post-1914 water rights. In April 2020, the District Board approved an amendment to the WSA that gave the District flexibility to provide surface water to the SRWA for the RSWSP using its pre-1914 rights, post-1914 rights, or some combination of both. The petition process is ongoing with a goal of obtaining SWRCB approval of the water transfer by July 2021.

In June 2020, the SRWA Board approved a contract with Jacobs Engineering to design and construct a raw water pump station, a raw water transmission pipeline, a water treatment plant, and two finished water transmission pipelines. Operation of the entire project is set to commence in June 2023.
In October 2020, the District sold the parcel that the RSWSP will be sited on to the SRWA. The District will retain ownership of the raw water pump and the pipeline delivering water to the RSWSP and is paying twenty percent of its construction cost. The purpose of this retention is so that the District can pump water into the Ceres Main Canal in the future if this necessity arises. The District has contracted with the SRWA for the SRWA to perform Operation and Maintenance on those items.

While the cities of Ceres and Turlock have already enacted water rates to fund the project, the SRWA continues to work on obtaining grant funding and low-interest loans to lower the project's cost.

The District is also responsible for supplying water to the town of La Grange. In 2020, two new water storage tanks were installed since the existing tanks were nearing the end of their service life. In 2021, it is anticipated that a new raw water pump station will be constructed.
Electric System

General

The District owns and operates an integrated electric generation, transmission and distribution system that serves over 104,000 customer accounts within a 662-square-mile area. Over the last several years, the District has expanded and diversified its generation assets, developed a comprehensive conservation program, embraced renewable generation, and continues to adjust to changing legislative and regulatory requirements. The following sections describe the key segments of electric utility operations and many of the programs adopted by the District.

Response to Potential Competition

The District continually responds to changes in the electric industry, is evaluating or re-evaluating initiatives, and continues to position itself for corrective actions that may be needed to address the evolving electricity industry structure. In 2020, much of this activity focused on the District’s response to renewable energy mandates and increased activity from distributed (i.e. rooftop) solar providers in its service territory. As discussed below, distributed solar reached five percent of peak demand in 2014, which by statute allowed the District to re-evaluate how its self-generation rates are structured to accommodate increased prevalence of customer-sited generation in its territory. The District took measures, despite controversy and objections from solar power providers, to reduce the cross-subsidy associated with new customer solar, while continuing net metering and grandfathering without changes to those who installed self-generation under the state-mandated five percent cap. The District’s successor tariff has resulted in continued but slowed growth of solar. Since the change, the number of customer solar accounts has increased to 2,437 accounts in 2020.

The Legislature passed AB 117 (Migden) in 2002 to allow cities and counties to provide Community Choice Aggregation within their boundaries. Service territories of Publicly Owned Utilities are exempt from this legislation, so it has not affected the District.

TID Balancing Authority Area

In order to control transmission costs and to maintain control of its generation and transmission assets, the District, effective December 1, 2005, established a Balancing Authority Area (BAA) separate from the California Independent System Operator (CAISO) BAA. The District has full responsibility for generating, scheduling, balancing, and delivering power to its customers. The District reports that coordination with the CAISO and operations of the BAA are working well. The District does not plan to become a part of the CAISO BAA. The establishment of a BAA has reduced the uncertainty caused by the variability in CAISO policies and rates, and is expected to continue to reduce power supply costs over what they would be with full CAISO participation. The District has created a second power control center as a back-up to its primary center located in central Turlock. The back-up center is available in the event the District has to abandon the existing center in any sort of an emergency. The District
and Scheduling area also has a back-up plan and location to continue economic dispatch operations should an emergency require relocation.

The District has entered into separate operating agreements with the CAISO and the Balancing Area of Northern California (BANC) defining how they will operate as interconnected BAAs. BANC is made up of the electric service areas of the Sacramento Municipal Utility District (SMUD), Modesto Irrigation District, The City of Redding, and most of the Western Area Power Administration Sierra Nevada Region. The District has also amended its system Interconnection Agreement (IA) with Pacific Gas and Electric Company (PG&E) in order to address the District’s status as a BAA.

As a BAA separate from the CAISO, the District only incurs CAISO Grid Management Charges, Wheeling Access Charges, and other CAISO charges when the District chooses to purchase or sell energy from or to the CAISO. By operating as an independent BAA, the District avoids the uncertainty associated with paying the myriad of fees imposed by the CAISO on customers within the CAISO BAA.

Other major benefits are accruing with operation of the 250 MW WEC located in west Turlock. When this natural gas-fired plant was completed, it doubled the District’s in-house generating capacity and at times can provide power in excess of its retail customers’ needs. Surpluses are sold pursuant to contracts described in this report or on the open market.

With the completion of the Almond Power Plant’s Units 2, 3 and 4 in the summer of 2012, TID acquired an additional resource that serves to bolster the District’s ability to match generation to load on a continuous basis. The flexibility of the units has provided the opportunity to sell operating reserves, capacity, and energy to neighboring balancing authorities and utilities when not needed for District use.

**Customers, Sales, and Peak Demand**

In 2020, some utilities experienced a decline in energy sales due to the effects of the COVID-19 pandemic. However, because of the agricultural and other industries served by the District, TID experienced a slight increase in sales. The 2020 annual peak demand of 571 MW for TID only and 688 MW for the BAA occurred during August. TID 2020 peak demand was up 6.3 percent from the 2019 peak demand. During 2020, the District experienced a slight increase in the number of accounts and a slight increase in electricity sales. Total revenues decreased by 0.3 percent. At the end of 2020, the District served 103,984 retail customer accounts. Retail energy sales were 2,164 gigawatt hours (GWh), up slightly by 5.8 percent from 2019. Retail revenues increased 4.0 percent from those realized in 2019 to approximately $275.3 million. Selected electric operating statistics are shown in the following table:
Customers, Sales and Peak Demand

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</tr>
</thead>
<tbody>
<tr>
<td>Accounts – Year End</td>
<td>103,984</td>
<td>103,266</td>
<td>102,950</td>
<td>0.7%</td>
<td>0.3%</td>
</tr>
<tr>
<td>System Peak Demand – MW</td>
<td>571</td>
<td>537</td>
<td>526</td>
<td>6.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Retail Energy Sales – MWh</td>
<td>2,163,507</td>
<td>2,045,817</td>
<td>2,045,839</td>
<td>5.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Revenues – $1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail *</td>
<td>$275,323</td>
<td>$264,836</td>
<td>$268,963</td>
<td>4.0%</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Wholesale Electric</td>
<td>47,052</td>
<td>54,980</td>
<td>53,476</td>
<td>-14.4%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Wholesale Gas</td>
<td>2,005</td>
<td>3,600</td>
<td>4,311</td>
<td>-44.3%</td>
<td>-16.5%</td>
</tr>
<tr>
<td>Other Electric</td>
<td>4,383</td>
<td>6,237</td>
<td>4,315</td>
<td>-29.7%</td>
<td>44.5%</td>
</tr>
<tr>
<td>Total</td>
<td>$328,763</td>
<td>$329,653</td>
<td>$331,065</td>
<td>-0.3%</td>
<td>-0.4%</td>
</tr>
</tbody>
</table>

Rates and Energy Services

TID uses the Power Supply Adjustment (PSA) to accommodate the changing costs for procuring fuel and energy. The PSA, which was implemented in 2005, will continue to be used as a means of accommodating the unpredictable costs of procuring fuel and energy to meet customer demands and will be reviewed semi-annually and adjusted as necessary. The PSA is designed specifically to fund purchased power costs net of wholesale sales and fuel costs in excess of the amount of such costs recovered in base rates subject to the limitations specified in the District’s policy on the PSA. Similarly, a credit will be provided to retail electric customers if the base rates are in excess of what is needed to pay for such costs. Future adjustments are generally calculated and applied at six-month intervals, the reviews occurring each April and October, with adjustments going into effect in June and December.

The PSA will not add more than 1¢ per kWh to the base rate. Market fluctuations that force the net cost of power and fuel higher than the 1¢ per kWh may be absorbed through transfers from the District’s existing rate stabilization fund. In cases where net power and fuel costs fall below costs recovered in base rates, customers will realize a reduction of up to ½¢ per kWh in their bills and surplus savings may go back into the rate stabilization fund. The PSA began the year at a credit of 0.5¢ per kWh, where it remained through 2020. The District expects the PSA to remain a credit of 0.5¢ per kWh to the customer in the near term but as power supply costs change, the District expects the PSA rate will change accordingly. The calculation at year-end for the PSA showed a balance due to customers of $104 million. In November 2017, the Board of Directors approved a resolution authorizing transfer of funds from the PSA Balancing Account to Rate Stabilization Account to utilize monies to fund capital projects beginning in 2018 through 2020, reduce the amount of the District’s next bond

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refunding, reduce the District’s unfunded pension liability, and reduce the District’s unfunded OPEB liability.

In December 2011, the Board of Directors approved a new charge to cover the increasing costs of complying with environmental regulations through an Environmental Charge (EC). The EC became effective February 1, 2012. The EC costs include the cost of the Tuolumne Wind Project, AB 32 Compliance, and future costs to comply with environmental laws, rules and regulations as may be placed upon the District. Some of these costs were formerly collected under the PSA. The EC is set at $0.0269/kWh.

The District has a Facilities Charge (FC) applicable to electric customers of the District located in the Westside service area acquired from PG&E in 2003. The revenues derived from the FC are used to pay such customers’ share of non-bypassable charges until completely paid off. All non-bypassable charges were paid off in 2020, and the Facilities Charge ended.

Electric Rates

In December 2014, the District’s Board of Directors approved proposed changes to the District’s current rate structures as it faced a projected revenue shortfall in 2015. The District covered this shortfall through an increase in base rates of two percent, and transfers from the Rate Stabilization Fund.

In 2014, the District proposed that rate structures for self-generation customers be changed. As a result of State mandates, solar installations increased dramatically in TID’s service area, reaching the five percent California net metering cap in November 2014, enabling the District to restructure its self-generation rates. The new self-generation rates are composed of a customer, demand, and two-block time-of-use energy charges, where generation and consumption are netted monthly within the two time blocks. The self-generation rate schedules covers a portion of the District’s full cost of service for self-generation customers with the intent, they will eventually reflect the total cost of service in increments over the next few years rather than all at once. The District feels this is consistent with its recently approved policy on solar neutrality which reads:

“[the] District shall be neutral as to whether or not customers choose to install solar generation and shall not erect any artificial barriers to the customer’s informed decision to install solar generation. TID’s policy goal shall be fairness and rate equity between solar and non-solar customers as well as provide quality resources to assist customers interested in solar as an energy option.”

Competitiveness of TID

The largest utility in the region surrounding the District is PG&E. The District compares favorably with PG&E’s electric rates schedules and other utilities in the area, as shown in the following table:
The table above compares the average annual usage for a customer in the rate schedule, with an average load profile.

**Public Benefits Programs**

The District’s state mandated Public Benefits Programs are funded by a 2.85 percent public benefits surcharge on the retail energy sales. A Consumer Programs Division has been established to provide assistance on outreach and to implement and achieve the District’s energy efficiency goals. Current programs include:

- As of December 2020, the District was providing a low-income discount to 4,397 qualifying customers. The CARES program reduces the monthly customer charge of $17 to $6, a savings of $11, and provides a 15 percent discount on the first 800 kWh energy charges.

- The District provides a 50 percent discount on the first 500-kWh energy charges for customers who use additional energy due to life-support equipment or a medical condition.

- The District contracts with several local agencies to provide dwelling weatherization for low-income customers. This facilitates more efficient energy use while improving comfort and reducing energy bills.

- Two Energy Efficiency Analysts works with retail customers to provide energy audits.

- Two fully functional customer service centers are maintained, in addition to the one in the headquarters office, to increase customer service and to further public benefits outreach, particularly the low-income programs.

- Meter Manager has been implemented providing industrial customers with detailed energy usage information. Customers can go on-line to monitor their energy consumption and monitor the impact in energy charges caused by changes in operations.
Premier Shade Tree Program: TID held its annual premier shade tree program that encourages energy efficiency by planting shade trees. TID sold shade trees with planting kits to customers at a discounted rate. Shade trees help to clean the air, provide oxygen and reduce pollution, along with saving energy and money.

Energy Education Program: TID provides a free energy education program for local teachers and students. The program educates the youth by providing lessons that incorporates technology that encourages energy efficiency, conservation and renewable energy. Students receive a free Energy Efficiency Kit, which will help families save energy at home at no cost to the school or families.

2020 Public Benefits Summary
Public Benefits revenue and expenses for 2020 was $8.36 million. No funds were carried into or out of the fiscal year.

AB 2021 Compliance
California passed AB 2021 in 2007, which requires each local Publicly Owned Utility (POU), on or before June 1, 2007, and by June 1 of every third year thereafter, to identify all potentially achievable cost-effective electricity efficiency savings and to establish annual targets for energy efficiency savings and demand reduction for the next 10-year period. Within 60 days of adopting annual targets, each local Publicly Owned Utility shall report those targets and the basis for establishing those targets to the CEC. In March 2013, the Board of Directors adopted a 10-year plan to promote energy conservation through gains in customer efficiency projects. Subsequently, California passed AB 2227 which changed the timelines established by AB 2021 by making the identification of targets due March 15, 2013 and by March 15 of every fourth year thereafter.

The 2020 target was to conserve 14.93 million kWh’s. Of the 14.93 million kWh’s, 5.08 million kWh’s were for codes and standards. TID was able to achieve its program goal of 9.85 million kWh’s and saved 14.15 million kWh’s, through various programs. 92 percent of the non-residential savings is attributed to LED lighting. TID replaced its high pressure sodium dusk to dawn street lights to LED’s, saving customers 419 thousand kWh’s.

In 2020 TID’s non-residential lighting projects achieved the majority of these saving at 13.05 million kWh’s. Large warehouse distribution facilities who have upgraded their lights to LED’s saved 3.92 million kWh’s, which was 30 percent of the total savings.

Transportation Electrification
As part of the State of California’s goals for transportation electrification, Executive Order B-16-12, B-48-18 and the Clean Energy and Pollution Reduction Act, provides utilities funds to promote transportation electrification.

In October 2018, TID’s Board adopted an Electric Vehicle Program. This plan includes strategies for electrifying TID’s fleet. A program for employee workplace electric vehicle charging, which shall include a fee for this service. Lastly, a rebate program for
customers, which include; Residential electric vehicle rebate, residential and non-
residential charger rebate and funds for partnership programs.

In 2020, TID fleet consisted of 1 battery electric vehicle, 5 plug-in hybrid and 3 line
tucks with 40’ electric buckets. TID offered 30 electric vehicle parking spots available
to employees throughout the District properties. Due to the pandemic, only 6 employees
are actively utilizing those parking spots. TID also issued 99 electric vehicle rebates, 48
electric vehicle charger and 16 electric forklift rebates.

**Transmission and Distribution Facilities**

The District owns 379 miles of transmission line, approximately 2,300 miles of
distribution line, and 29 substations. The District’s electric system is directly
interconnected with Hetch Hetchy Water and Power at Oakdale, PG&E at Westley,
Modesto Irrigation District at Parker, Western Area Power Administration at Tracy, and
Merced Irrigation District at Pioneer. During 2020, the District invested approximately
$9.9 million in new distribution facilities to serve new customers, replace worn
components, and upgrade lines.

In 2016, the District completed installation and setup of specialized software that
provides continuous real-time contingency analysis capabilities. Based upon
recommendations developed as a result of the 2011 Southwest Blackout and the
resultant NERC Reliability Standards, this software models the District’s system and
predicts the system’s response to various internal and external contingencies should
those contingencies occur in real-time. Predictive response is based upon real-time
telemetry and state estimation capabilities that are part of the software. Additionally,
the District has contracted with RC West to receive backup Real Time Contingency
Analysis support in order to ensure the District retains robust and ongoing real time
analysis capabilities. The result is ongoing increased situational awareness and
reliability of the District’s transmission system, along with the ability to preempt the
effects of various contingencies before they might occur.

In 2018, TID began a multi-year project to repaint 174 230 kV steel poles. TID owns
57 poles and TID and MID jointly own 117 poles. The poles have extensive rust and
contamination that requires abrasive blasting and containment prior to painting.
$1,261,000 was spent in 2020 spring season and painted 29 poles. The project is
expected to continue through the winter season for the next 3 years. MID will share the
cost of painting jointly owned poles.

TID owns approximately 70,000 wood poles. Each year, TID plans to perform intrusive
testing of 10% of its wood poles, and to replace or reinforce decayed and damaged poles.
In 2020, TID inspected 6,255 poles and 115 poles were found that needed replacement
or repair, a reject rate of about 1.8%. Total 2020 project expenses were $1,080,000.
Distribution System Reliability

The District has continued several programs to control the number and duration of distribution system outages and is using industry measures of reliability to monitor quality of service. Programs include contracting out tree-trimming, replacement of underground cable based on failure trends, prioritizing preventative equipment inspections according to reliability impact, and refinement of data categorization. Throughout 2020, the average customer was without power for approximately 56 minutes. The 2020 frequency of outages averaged less than one outage per customer (0.57). The District continues to use these statistics to help identify distribution system challenges and to refine its emphasis on addressing those challenges.

Cable Replacement Project

The District’s ongoing underground cable replacement program continues to systematically replace underground cable with new cable in conduit in order reduce impacts to service and reliability. This is done for cable experiencing multiple failures, or for cable reaching its end of life expectancy. Replacement work is prioritized by emergency needs, support for load growth, and cable life expectancy. This frequently includes placement or replacement of conduit as an added measure of serviceability. In 2020, the District replaced 1.6 miles of underground cable and installed 2.2 miles of conduit.

Wildfire Mitigation Plan

In 2019 in accordance with a new state law, TID prepared a Wildfire Mitigation Plan (WMP). The WMP is an action plan for reducing wildfire risk from TID electric facilities. The plan addresses new state required vegetation clearance and line inspections. TID complies with all legal requirements, and is taking additional steps to harden its electrical system in areas of high fire risk. The WMP addresses installation of equipment and new operational protocols that will reduce the risk of fire ignition from TID facilities and personnel. TID’s Board approved the Wildfire Mitigation Plan in November of 2019. California Senate Bill 901 (SB 901) mandates that local publicly owned electric utilities or electrical cooperatives shall, before January 1, 2020, prepare a WMP. Additionally, publicly owned electric utilities and electrical cooperatives are required to contract with a qualified independent evaluator with experience to assess the comprehensiveness of its WMP. TID had requested Grid Subject Matter Experts (“GridSME”) to conduct a review and assessment of their WMP to ensure it meets the requirements outlined in SB 901. GridSME concluded TID’s Plan is comprehensive and meets the requirements of PUC §8387.

Microwave System Upgrades

In 2018 the District commissioned an engineering assessment of its microwave communications network, to determine the requirements for continued operations and how to meet the growing demand for additional bandwidth.

The study determined that many of the radio links and associated equipment were approaching obsolescence and suffered from reduced functionality, lack of vendor
support and non-availability of spare parts. The system also had limited capability to integrate with modern communication technologies.

The assessment recommended a three-year microwave system upgrade which would focus on replacement of the most critical communication links in Phase I, replacement of less critical and unlicensed links in Phase II, and creating redundancy and resilience and integration of newer technologies in Phase III.

Phase I of the microwave system upgrade was completed in August of 2020 and Phase II was completed in December of 2020. Phase III construction is anticipated to begin in July of 2021 with an anticipated completion date in December of 2021.

**Existing Generating Facilities**

**Don Pedro Power Plant**

The Don Pedro Project consists of a dam, a reservoir, and a powerhouse on the Tuolumne River 3.5 miles upstream of La Grange Dam. The powerhouse generating capacity is 203 MW under normal water conditions. The District’s ownership share is 68.46 percent, which equates to approximately 139 MW. Don Pedro is operated and maintained by TID. In 2020 the District’s share of energy produced from Don Pedro generation was 225 GWh. Average annual energy production for the District has been 304 GWh over the last 10 years. Turbine/generator inspections are performed yearly and minor cavitation repairs are typically made annually for each unit turbine. Automated generator controls have been added to all units to facilitate BAA operations. The District added an air gap monitoring system upgrade to Unit 3 in 2011 and the other units have also been upgraded. A continuous Partial Discharge (PD) system was fully commissioned in 2012 and staff continues to evaluate the information obtained thereby regarding operation and longevity of the generators. As part of the Don Pedro Upgrade Project, all generating units were thoroughly inspected in 2017 and electrically tested in 2013. An inspection of Generation Units 1-3 was performed while the power tunnel was out of service for the tunnel rehabilitation project. The inspection found that all three Units 1-3 have either cracks or indications in the rotor spider to rim connections. Generation experts from two consultants were brought on board to assist TID in addressing the issues. Unit 2 was concluded to be safe to operate, and was brought back to service. Units 1 and 3 had repairs implemented in 2018.

The District overhauled Unit 4 in 2000/2001, Unit 2 in 2004/2005, and Unit 3 in 2006/2007. The overhaul of Unit 1 completed this overhaul cycle in 2008. In 2011, Unit 4 had modifications performed to its collector ring system to prevent carbon dust build up on the rotor. Unit availability in 2020 was as follows: Unit 1: 79.42 percent, Unit 2: 82.53 percent, Unit 3: 72.66 percent, and Unit 4: 83.64 percent.

In July 2016, the Turbine Shutoff Valve (TSV) that serves the 4th branch of the power tunnel manifold which in turn serves the Hollow Jet Flood Control Valve and Unit 4 generator, failed to close under routine maintenance operation and was removed from service while a new valve was procured. The new valve was installed in 2017 and was tested under dynamic flow conditions. The valve successfully closed although damage to the valve was detected. Unit 4 was placed back in service in December of 2019 after
the successful installation of a new Butterfly Style TSV. The new TSV was successfully tested with full flow through Unit 4.

In preparation for the Power Tunnel rehabilitation, an inspection was performed on the newly refurbished (2016) Diversion Tunnel equipment. The inspection revealed the bronze thrust nuts on the slide gates had failed. The nuts were replaced with 17-4 stainless steel nuts. The Diversion Tunnel was placed back in service and used exclusively during the Power Tunnel outage. A follow up inspection was performed after the completion of the Power Tunnel outage that revealed no damage.

The Power Tunnel rehabilitation project was completed in 2017. Major components of the work included fabrication and installation of new bulkhead and fixedwheel gates, and a new Unit 4 TSV. The bulkhead and fixedwheel gates were commissioned successfully.

The Don Pedro power house, commissioned in 1971 was built for a 30-40 year life span, and has reached the point where many of the components are obsolete and beyond their service life. In 2013 the District started in earnest on the life extension measures for the systems and components around the Turbine/Generator. This work included the refurbishment of the ancillary components of the powerhouse such as the Power Tunnel, Diversion Tunnel and associated Bulkhead and Fixedwheel Gates and controls. The Districts’ also intend on upgrading the Don Pedro Turbines and Generators, and in 2020 completed a robust analysis of various Turbine/Generator combinations. TID and MID Staff worked with Stantec and Ascend Analytics to produce a cost/benefits study with the objective of choosing the optimal capacity combinations. On August 18, 2020, TIOD Staff held a Board Workshop presenting the results of the analysis, which is an uprate of plant capacity from 204.7 MW to 264.3 MW. TID will be getting bid packages in from prospective vendors in May of 2021, with the goal of having the entire Life Extension done by 2026.

Water Year 2020 was below average, approximately 51.32% of average. TID’s Don Pedro generation was 225 GWh in 2020 compared with an average (1984-2019) of 367 GWh. The decreased generation was due to the below average hydro conditions. Don Pedro Reservoir storage was at 1,625,922 acft at the beginning of 2020 or 96 percent of maximum capacity and ended with a storage of 1,363,961 acft or 81 percent of maximum capacity. As a result of the below normal conditions and generator unit availability, Don Pedro generation for 2020 was 10.4 percent of retail load compared to roughly 18 percent in an average year.

**Thermal**

**Walnut Combustion Turbines**

The District owns two gas-fired combustion turbine generating units, each having a capacity of 24.8 MW, as limited by the Air Pollution Control District’s (APCD) Permit to Operate. Located at the District’s Walnut Substation, these units were placed in service in 1986 and are used to generate power during peak periods and provide operating reserve, offsetting purchases of more expensive power. These units are available 100 percent of the time (two-unit average) and reduce the need to purchase...
reserves. The District has upgraded the combustion technology to lower emissions and modified emission controls to comply with September 2007 APCD standards. The units are capable of dual fuel operation and in 2011 are tested bi-annually on natural gas and diesel fuel. The units have been permitted for 877 hours per year. The APCD has implemented new NOx rules which place additional restrictions on these turbines. The new restrictions limit operations, other than those related to “Energy Emergencies,” to a maximum of 200 hours per year. Additionally, each hour of operations related to “Energy Emergencies” shall incur a penalty from the APCD.

**Almond Power Plant**

The Almond Power Plant, a steam-injected combustion turbine power plant, was brought online in 1996 and is owned and operated by the District within its service area west of Ceres.

The District repowered the Almond Power Plant in 2003 with a new LM 6000 turbine-generator, which resulted in a slight increase in capacity to 48.3 MW (net) and an improvement in fuel efficiency. During 2020, this unit generated approximately 66 GWh. The engine received a 25,000 hour major overhaul and hot section replacement in 2012 and was returned to service after several weeks at the GE depot.

**Almond II Power Plant**

In October 2008, the District Board of Directors approved the addition of three new LM 6000PG units (174 MW) at the Almond site to provide for increased system reliability and generation reserves, to potentially defer the addition of transmission at Ceres, and to defer external transmission investment. The District submitted APCD and CEC preliminary filings in March and April 2009, respectively. On December 15, 2010 the CEC issued its final decision authorizing the license, and construction began on February 28, 2011. Mechanical completion occurred on March 20, 2012 within the estimated budget of $220 million and the project completed testing and commissioning and entered commercial operation in July 2012. In 2020, Almond II produced 181 GWh.

**Walnut Energy Center**

The WEC is a 250 MW natural gas-fired, combustion-turbine based, combined-cycle generating plant. Construction was completed in 2006 on an 18-acre site at the western edge of the City of Turlock, within a short distance of the Walnut Substation and the Walnut combustion turbines. The plant includes two 85 MW combustion turbine generators and one steam turbine-generator rated at 100 MW, two heat recovery steam generators, a condenser, cooling towers, a new 3.6-mile-long gas pipeline, and a new 13.8/115 kV switchyard.

The WEC has a tested heat rate at standard atmospheric conditions of 6,735 BTU per kWh LHV (lower heating value). The gross capacity is 257 MW, which, after subtracting parasitic load, results in between 250 and 254 MW delivered to the grid (depending on the delivered natural gas pressure and ambient weather conditions). In 2020, the WEC produced 1,253 GWh.
The WEC was designed to use reclaimed water from the wastewater treatment plant operated by the City of Turlock. The plant was initially operated using groundwater for 17 months while awaiting the availability of reclaimed water. About seven percent of the water used by the plant has been groundwater; it was used when the City’s reclaimed supply was not available. Studies indicate that even at maximum possible continuous usage of groundwater over a 50-year period, there would be no significant impact to deep wells and nearly insignificant impact to only one shallow well in the vicinity. A permit for permanent switch to reclaimed water for the plant cooling was received in 2007. TID applied in January 2011 for a license amendment at the CEC to allow increased use of “poor quality” groundwater during times when the City reclaimed water is not available in sufficient quantities. On August 27, 2013, the CEC approved TID’s proposed Amendment to increase the maximum annual groundwater usage limit. The reliability of the reclaimed water has improved, since the time this amendment was approved, resulting in a significant reduction in the plant’s usage of groundwater.

In 2013, WEC Unit 2, a GE Frame 7EA unit underwent its first major inspection wherein the rotor is removed and major overhaul of bearings and turbine components including replacement of combustion hardware occurs. The inspection went very well and uncovered no major issues. The work was completed on time and slightly over the budgeted amount of $2,000,000. Also in 2013, WEC Unit 3 underwent its first major inspection wherein the rotor is removed and the steam path is cleaned and inspected, and the steam valves are overhauled. According to the District, all inspections went very well and uncovered no major issues. In 2012, WEC Unit 1 underwent the same. In 2016, WEC had a new, large capacity belt press installed which resulted in higher efficiency of the unit. Many other smaller maintenance efforts and enhancements will occur as is typical for facilities of this type and configuration.

**Negotiated PG&E Transportation Rate**

After the 2020 Budget was finalized, TID negotiated a revised natural gas transportation rate with PG&E that started in 2020 that runs through 2022. The net effect of the new rate is that it improves the economics of TID’s Thermal Fleet as compared to the market, and is projected to increase the amount of thermal generation and reduce market purchases in 2021 and 2022. TID and PG&E will likely be revisiting the transportation rate in 2022.

**Renewable**

**Renewable Hydro**

The District also owns and operates the La Grange powerhouse. Completed in 1924, La Grange powerhouse has a total operating capacity of approximately 5.3 MW. Average annual energy production for the last 10 years has been approximately 12 GWh.

The District also owns three hydroelectric generating facilities located on its irrigation canals. The completion dates and operating capacities of these facilities are:
Tuolumne Wind Project

In November 2008, the District entered into agreements and approved the financing required to acquire a 136.6 MW, 62-wind-turbine-generating facility located near Goldendale, Klickitat County, Washington, along the Columbia River. The project is connected to the Bonneville Power Administration (BPA) transmission system at the Rock Creek Substation and is comprised of 42 Siemens Wind Turbine Generators (WTG) and 20 Repower WTGs. The project achieved commercial operation in May 2009. In 2020, the project produced 422 GWh, with a capacity factor of approximately 35.3 percent. The plant has operated close to expectations. Operating procedures have been developed and refined to maintain close coordination with the Balancing Authority that provides ancillary services to the facility. Wind projects that are connected to BPA’s system oftentimes have production that is curtailed due to specific hydrologic conditions that may exist. TID completed the move to the Avangrid Balancing Authority in November 2020. This move will mitigate the TWP exposure to the high wind/high water event curtailments that TWP currently contends with on the BPA system and lower integration costs.

In 2020, curtailments required by BPA continued to be prevalent, especially curtailment requests under the Over Supply Management program. On-site operations and maintenance of the project is contracted to EDF Renewable Energy. The 20 RePower/Senvion units O&M service provider has recently filed for bankruptcy and has defaulted on the O&M Services contract in place. TID has a short term agreement in place with another service provider, and is currently evaluating long term solutions for O&M services for the 20 RePower turbines. A 12-year agreement with Siemens for the remaining 42 turbines was executed in 2016.

During 2010 routine monitoring of power transformers (2,200-2,500 KVA) detected an unexplained increase in the production of hydrogen within the main tank of some of the individual turbine transformers. The OEM worked with a manufacturer to design and produce solid state bushings to address the problem. While there is a high expectation by the OEM as well as TID staff and a third party transformer expert that the new solid-dielectric bushing solution will solve the TWP-specific bushing issues, it is not expected to completely eliminate production of hydrogen in the tank on all units (this remains an industry issue and concern remains unresolved at nearly all wind facilities). TID staff and The ABB Group believe that the industry standard and as yet unsolved issue remains, though the exacerbating problem with the bushings has been solved. TID has procured, installed and tested four power transformers on the worst case Siemens turbines and the results are very positive with no relative hydrogen production in the

<table>
<thead>
<tr>
<th>Hydro Facility</th>
<th>Completion Date</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hickman Power Plant</td>
<td>1979</td>
<td>1.1 MW</td>
</tr>
<tr>
<td>Turlock Lake Power Plant</td>
<td>1980</td>
<td>3.3 MW</td>
</tr>
<tr>
<td>Dawson Power Plant</td>
<td>1983</td>
<td>5.5 MW</td>
</tr>
</tbody>
</table>
first year of operation. In 2019, TID completed the process of replacing these transformers.

In 2015, the TWP completed work on installing two split feeders in an effort to allow for better protection of the plant. A spare ~150 MVA 230/34.5 KV transformer for the entire site was purchased and arrived on site in early 2017 and is now in service.

**TID Solar PV**

In 2009, TID installed a 70.7-kW array of photovoltaic panels atop the newly renovated parking structure. While it will add some additional renewable energy to the District’s portfolio and help to offset a small portion of the energy consumption of the District’s administration building, the primary purpose of the installation was for demonstration purposes. The system, which includes 378 Sanyo 210n series panels, is expected to generate a total of 132,460 kWh a year for the District. In 2020, generation was 124 MWh.

**Community Solar**

TID is analyzing building a local medium scale solar farm to support an increasing number of customers that have sustainability goals of their own. This project would provide the subscribed customers an alternative to behind-the-meter solar, as well as helping TID in reaching its renewable and carbon free goals. TID plans on finalizing its analysis and program details for presentation to the Board in 2021.

**Purchased Power**

**SunPower PPA**

In 2014, the District conducted a Renewable Energy Request for Proposals (RFP). Pursuant to the RFP, the District received ten proposals from existing projects and 119 from proposed projects (129 in total) from a total of 29 entities.

In November, 2015, TID announced that it had signed a 20-year power purchase agreement (PPA) with SunPower to purchase renewable solar power. Under the agreement, SunPower started construction on a 54 MW (AC) solar photovoltaic power plant at the company’s Rosamond Solar site in Kern County. In total, Rosamond Solar may support up to 300 MW of solar power generation for different offtakers. TID began receiving commercial power from the plant in February of 2017. TID anticipates the plant to generate approximately 155,000 MWh a year. TID estimates the PPA will move the District approximately seven percent closer to meeting the recently increased RPS requirement of 50 percent renewables by 2030. On June 19, 2020, fire damaged about 16 MW and had to be taken offline. About a two weeks later, 2 MW of the 16 MW that were taken offline were deemed safe to operate and was energized for a total of 40 MW operating capacity. Restoration of the remaining 14 MW offline is expected sometime in Q3 2021.
Biomass PPA

SB859 was approved by the California Governor on September 14, 2016 which, among other things, requires local publicly owned electric utilities serving more than 100,000 customers to procure its proportionate share, based on the ratio of the utility’s peak demand to the total statewide peak demand, of 125 megawatts of cumulative rated capacity from existing bioenergy projects that commenced operations prior to June 1, 2013. The PPAs must have a term of at least five years. Furthermore, at least 80 percent of the feedstock, on an annual basis, shall be a byproduct of sustainable forestry management, which includes removal of dead and dying trees from Tier 1 and Tier 2 high hazard zones and is not from lands that have been clear cut, and at least 60 percent of this feedstock shall be from Tier 1 and Tier 2 high hazard zones. TID’s proportionate share is 1.3 MW. To meet its requirement under SB859, TID jointly executed with the other POU’s covered by SB859 an 18 MW five year power purchase agreement to procure power from the ARP-Loyalton Cogen LLC (“ARP PPA”). TID’s proportionate share of the ARP PPA is 0.8 MW. Deliveries under the ARP PPA began on April 20, 2018. TID is currently participating with the other POU’s covered by SB859 in another joint procurement to fulfill the remainder of its obligations under SB859. TID expects to fulfill its remaining SB859 obligations in early 2021.

On December 31, 2019, TID received notice from US Bank, Loyalton’s letter of credit provider, that they have elected not to renew the letter of credit that will expire on April 5, 2020. SCPA on behalf of all the PPA participants contacted Loyalton to discuss a replacement letter of credit. On February 18, 2020 Loyalton filed for Chapter 11 bankruptcy. TID and the other participants have not received power under the PPA since February 2020. On March 26, 2020 TID and other participants drew the full amount of the letter of credit from US Bank (funds were received on April 2, 2020). On March 18, 2020, the case was converted to a Chapter 7 bankruptcy filing. On May 7, 2020, the plant was sold to another entity. TID as well as the other participants filed a Proof of Claim on July 30, 2020. TID and the other participants have been monitoring the bankruptcy proceeding and is current in discussions with involved parties regarding acceptance of the PPA by the bankruptcy Trustee.

City and County of San Francisco (CCSF)

CCSF generates power at its Hetch Hetchy Water and Power Project located in the upper Tuolumne River basin. CCSF is obligated to provide TID a portion of the energy generated from the Hetch Hetchy Project that is not needed to supply CCSF firm load. Due to changing availability and cost of this energy, the District purchased 0 GWh of energy in 2020 from CCSF.

Northern California Power Agency (NCPA)

The District has purchased from several members of NCPA, on a take-or-pay basis, participation shares equal to 6.33 percent (6.4 MW in 2014) of the capacity and associated energy from NCPA’s Geothermal Plants No. 1 and No. 2. As steam supply changes, the District expects its share of available capacity and energy to change from approximately 47 GWh in 2020 to 43 GWh in 2025. The participation shares run for the life of the plant.
During 2011, the District elected to withdraw from the NCPA effective April 1, 2011. The District retained its share of the NCPA Geothermal Project and continues to participate in the Facilities Committee that oversees geothermal expenditures.

Western Area Power Administration

The District purchased 5.1 MW of firm Central Valley Project (CVP) power from Western through December 31, 2004, including 2 MW assigned to the District by the Patterson Irrigation District (PID) as of December 8, 2003. A new Base Resource Contract became effective on January 1, 2005, between Western and the District, allocating to the District 0.27342 percent of Western’s available capacity and energy from January 2005 through December 2024. In addition, the District has taken assignment of PID’s Base Resource Contract allocation of 0.1328 percent, which is used to offset TID’s obligation to serve PID’s electric load. Beginning January 1, 2015 TID’s allocation increased to 0.3348 percent. In 2020, the District received approximately 19 GWh under this contract.

Small Hydroelectric Power Development

In addition to the small hydroelectric projects within its service area, the District operates five small hydroelectric power plants outside of its service area with an aggregate installed capacity of 12.9 MW. Located in and owned by the neighboring Merced Irrigation District, and the South San Joaquin Irrigation District, the power from these five power plants is sold into the CAISO market and delivered to TID. In 2020, these projects generated 9 GWh and were sold to a third party and not delivered to TID.

Northwest Power Pool

In order to better manage reserve requirements, the District has joined the Northwest Power Pool (NWPP). Participation in the NWPP Reserve Sharing Group (RSG) has reduced the District’s reserve requirements by between 30 MW and 70 MW, depending on the real-time rating of and schedules on TID’s share of the COTP. During 2008, TID put in place the necessary contractual arrangements to implement reserve sharing with other members of the NWPP and trained the real-time operators and schedulers. TID began active participation in the reserve sharing group March 9, 2009. BANC also joined the RSG in 2009, which increases the benefit of the RSG to TID. TID will be able to share reserves with BANC even when there are transmission limitations on the transmission link to the Northwest.

Transmission and Interconnection

TID has transmission interconnection operating agreements with its two neighboring Balancing Authorities, the CAISO and BANC. TID has interconnection agreements with and direct access to Modesto Irrigation District, Merced Irrigation District, Western Area Power Administration, City and County of San Francisco, and PG&E.

Through its ownership interest in the COTP, TID can also transact directly with other owners of the project, as well as Northwest organizations that have transmission rights to the California-Oregon border, including (but not limited to) Bonneville Power
Administration, Portland General Electric, Sierra Pacific Corp., Seattle City Light, PowerEx, and PacifiCorp. In 2008, TID negotiated to increase its share of the COTP scheduling rights by purchasing a share of the City of Vernon’s rights (17 MW, effective April 9, 2009) and acquiring, via short-term layoff agreements, an additional 40 MW (15 MW from Roseville effective July 1, 2008 and 25 MW from the City of Palo Alto effective August 1, 2008). The short-term layoffs have been converted to a 15-year layoff agreement of 36 MW beginning February 1, 2009. The increased transmission capability provides greater access to non-CAISO markets, including wind resources, and further insulates TID from CAISO tariff changes.

TID acquired an additional 37 MW of COTP transmission rights through a long-term layoff agreement with Silicon Valley Power and NCPA members. The layoff is in place as of July 1, 2014 and will remain in place for 25 years.

**Power Sales**

**Merced Irrigation District (MeID)**

The District negotiated a ten-year Power Sale Agreement with Merced that began May 1, 2017. The agreement calls for TID to provide all the energy requirements for MeID load within the TID BAA with the exception of power delivered under MeID’s agreement with WAPA. Merced is also permitted to participate with Foster Farms to build a generating facility. Energy sold to Merced under this Power Sale Agreement is priced based on the appropriate NP-15 day ahead hourly index plus an adder or based on actual costs if purchased from the CAISO. Merced is responsible for any renewable energy and capacity requirements. Either District has the right to terminate the agreement effective May 2021 with two years notice.

Under separate agreement, TID agreed to supply Merced its capacity requirements for calendar years 2020 and a portion of its requirements for 2021-2023. Total revenues for the 2020 sale is $2.55 million and for the 2021-2023 sale is $10.8 million.

Merced and TID have also negotiated an interconnection agreement that includes cost based rates for transmission and ancillary services analogous to the standard Open Access Transmission Tariff promulgated by the FERC.

**Historic Power Supply Summary**

The District relies on three categories of power supply: District-owned generation, long term purchases, and the -short-term market. In 2020, energy produced from District owned- generation and outside small hydros was 2,182 GWh, up 2.1 percent from the previous year. Purchases of long-term power amounted to 190 GWh, down 13.1 percent from the previous year. Short-term market purchases were down 6.1 percent from the previous year. Hydrologic conditions led to the percentage of retail load supplied by Don Pedro generation being roughly 10.4 percent in 2020 versus roughly 19 percent in an average hydrologic year.

Selected power supply statistics are shown in the following table:
## Selected Power Supply Statistics

<table>
<thead>
<tr>
<th>Resources (MWh)</th>
<th>2020</th>
<th>2019</th>
<th>2018</th>
<th>2020-2019</th>
<th>2019-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>District-Owned:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don Pedro</td>
<td>224,607</td>
<td>393,954</td>
<td>222,071</td>
<td>-43.0%</td>
<td>77.4%</td>
</tr>
<tr>
<td><strong>Thermal:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walnut Energy Center</td>
<td>1,253,066</td>
<td>1,043,616</td>
<td>1,229,723</td>
<td>20.1%</td>
<td>-15.1%</td>
</tr>
<tr>
<td>Almond</td>
<td>65,821</td>
<td>71,339</td>
<td>49,830</td>
<td>-7.7%</td>
<td>43.2%</td>
</tr>
<tr>
<td>Almond 2</td>
<td>181,658</td>
<td>210,662</td>
<td>119,941</td>
<td>-13.8%</td>
<td>75.6%</td>
</tr>
<tr>
<td>Walnut Gas Turbine</td>
<td>(21)</td>
<td>(255)</td>
<td>10</td>
<td>-91.8%</td>
<td>-2650.0%</td>
</tr>
<tr>
<td><strong>Renewable:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>La Grange</td>
<td>13,643</td>
<td>10,749</td>
<td>8,374</td>
<td>26.9%</td>
<td>28.4%</td>
</tr>
<tr>
<td>Small Hydro</td>
<td>20,845</td>
<td>43,455</td>
<td>45,902</td>
<td>-52.0%</td>
<td>-5.3%</td>
</tr>
<tr>
<td>Tuolumne Wind Project</td>
<td>422,364</td>
<td>362,927</td>
<td>386,208</td>
<td>16.4%</td>
<td>-6.0%</td>
</tr>
<tr>
<td>TID Solar</td>
<td>124</td>
<td>125</td>
<td>130</td>
<td>-0.8%</td>
<td>-3.8%</td>
</tr>
<tr>
<td><strong>Total District Owned</strong></td>
<td>2,182,107</td>
<td>2,136,572</td>
<td>2,062,189</td>
<td>2.1%</td>
<td>3.6%</td>
</tr>
<tr>
<td><strong>Long-Term Purchased Power:</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biomass PPA</td>
<td>4</td>
<td>1,216</td>
<td>2,015</td>
<td>-99.7%</td>
<td>-39.7%</td>
</tr>
<tr>
<td>CCSF</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>NCPA</td>
<td>46,765</td>
<td>41,596</td>
<td>50,654</td>
<td>12.4%</td>
<td>-17.9%</td>
</tr>
<tr>
<td>PRC</td>
<td>0</td>
<td>0</td>
<td>147,731</td>
<td>0.0%</td>
<td>-100.0%</td>
</tr>
<tr>
<td>Solar PPA</td>
<td>124,502</td>
<td>149,759</td>
<td>153,318</td>
<td>-16.9%</td>
<td>-2.3%</td>
</tr>
<tr>
<td>Western</td>
<td>18,727</td>
<td>25,991</td>
<td>12,923</td>
<td>-27.9%</td>
<td>101.1%</td>
</tr>
<tr>
<td><strong>Total Long-Term</strong></td>
<td>189,998</td>
<td>218,562</td>
<td>366,641</td>
<td>-13.1%</td>
<td>-40.4%</td>
</tr>
<tr>
<td><strong>Short-Term Market Purchases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,054,996</td>
<td>1,123,411</td>
<td>1,043,819</td>
<td>-6.1%</td>
<td>7.6%</td>
</tr>
<tr>
<td><strong>Total Purchases</strong></td>
<td>1,244,994</td>
<td>1,341,973</td>
<td>1,410,460</td>
<td>-7.2%</td>
<td>-4.9%</td>
</tr>
<tr>
<td><strong>Total Supplied</strong></td>
<td>3,427,101</td>
<td>3,478,545</td>
<td>3,472,649</td>
<td>-1.5%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Less: Power Sales and Wholesale Adjustments</td>
<td>1,124,759</td>
<td>1,307,447</td>
<td>1,299,777</td>
<td>-14.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td><strong>Total Energy Delivered to System</strong></td>
<td>2,302,342</td>
<td>2,171,098</td>
<td>2,172,872</td>
<td>6.0%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Less: District Losses</td>
<td>88,909</td>
<td>76,811</td>
<td>78,222</td>
<td>15.8%</td>
<td>-1.8%</td>
</tr>
<tr>
<td>Less: Interdepartmental Sales</td>
<td>49,925</td>
<td>48,470</td>
<td>48,811</td>
<td>3.0%</td>
<td>-0.7%</td>
</tr>
<tr>
<td><strong>Total Energy Delivered at Retail</strong></td>
<td>2,163,508</td>
<td>2,045,817</td>
<td>2,045,839</td>
<td>5.8%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
NERC Compliance

In 2007, the North American Electric Reliability Corporation (NERC) promulgated new electric reliability standards that continue to be monitored and enforced by a number of Regional Reliability Organizations (RRO). For TID, the RRO is the Western Electricity Coordinating Council (WECC). The standards are intended to enhance the reliability of North America’s bulk power system by establishing enforceable requirements for power system planning, generation, coordination, notification, operation, and various other related electric utility activities. The District developed an Internal Compliance Program with the goal of ensuring the District's compliance with the mandatory electric reliability standards, with Department Managers and subject matter experts managing affected areas such as electric operations, system planning, generation, critical infrastructure protection, scheduling, and more. The Standards continuously evolve and the District regularly participates in ongoing compliance-awareness activities to ensure that it remains at the forefront of readiness. In April of 2020, the WECC conducted its latest triennial compliance audit of TID on behalf of NERC, which resulted in a very successful “no findings of non-compliance”. As demonstrated by that successful audit, the District continues to employ its robust Internal Compliance Program and continues to promote a dedicated culture of compliance.

In 2013, the District hired its first cyber-security analyst followed by a second analyst hired in 2015. With a third cyber-security analyst added in 2016 and a fourth in 2018, the District remains committed to maintaining robust and trend-setting compliance with all of the highly visible Critical Infrastructure Protection standards.

Wholesale Power and Natural Gas Activities

In the period 2018 through 2020, the District’s wholesale power sales averaged 1,236 GWh, approximately 59.3 percent of the average total energy delivered at retail. Since initial operation of the WEC, the District has had substantial surplus energy resources at non-peak times. The addition of the Almond II power plant in July 2012 further enhances the District’s opportunity to make wholesale sales of capacity, ancillary services, and energy. In 2020, the District sold 1,113 GWh of energy in the wholesale market and some capacity and ancillary services as well. The energy sold constituted 32.5 percent of total power generated and purchased by the District.

In order to manage the risk of the short- and intermediate-term surpluses, the District extended its contract with the MeID (see above). The District actively markets anticipated surplus power and capacity in the wholesale market when its resources are not required to supply the District’s customers.

Since it operates several natural gas-fired power plants, the District actively purchases and sells natural gas in the wholesale market. In order to manage its fuel supply and price risk, the District has entered into fuel management agreements and several industry standard natural gas purchase and sale agreements. The District also has enabling agreements so it has the ability to hedge its natural gas price risk through financial hedges. The District also has ownership interest in natural gas production.
facilities in Pinedale, Wyoming and in the Barnett Shale fields in West Texas that can provide approximately 10 percent of the gas consumed to serve retail load.

Renewable Portfolio Standard

Established in 2002 under Senate Bill (SB) 1078, accelerated in 2006 under SB 107 and expanded in 2011 under SB 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires IOUs, electric service providers, community choice aggregators, and POUs to gradually increase procurement from eligible renewable energy by 2020. In 2015, a new RPS bill, SB350, was passed increasing the RPS target to 50 percent by 2030. In 2018, SB100 was passed further increasing the RPS target to 60 percent by 2030 and a statewide planning goal of 100 percent zero carbon resources by December 31, 2045. In 2020, TID fully complied with renewable energy requirements by using generation from its current renewable resources and through the use of prior years qualifying energy and credits. Renewable energy credits above the interim requirements can be carried forward enabling the District to meet requirements through 2022-2024 depending on the performance of the TWP units, the District’s other eligible renewable resources, and actual retail load. Although energy produced by Don Pedro is renewable, large hydroelectric power plants are not considered eligible renewable resources by the CEC and as such do not contribute to meeting TID's RPS requirement but is a zero carbon resource. TID is currently in the process of reviewing a Request For Proposal (RFP) for the next layer of renewable procurement, and is targeting a decision in Q4 of 2021 for a project to come online in the 2024 or 2025 time frame.

Climate Change

In 2006, the California legislature passed and Governor Schwarzenegger signed Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, which set the 2020 GHG emissions reduction goal into law. The subsequent Scoping Plan and its updates adopted by the California Air Resources Board (CARB) adopted several important measures to reduce GHG emissions in the state, most notably for the District, CARB adopted a regulation that establishes a market-based system of tradable emission allowances as a function of declining annual aggregate emission limits for sources or categories of sources that emit GHG emissions, applicable from January 1, 2012, to December 31, 2020. SB 32 was passed in 2016 that established a goal to reduce CA statewide emissions to at least 40 percent below 1990 levels by December 31, 2030. Subsequent to the passing of SB 32, AB 398 was passed which extended the role of the current cap and trade program until December 31, 2030. CARB has adopted a new Scoping Plan and is in the process of developing related regulations for the 2021 to 2030 period to implement the goal established by SB 32 and extension of the current cap and trade program as provided for in AB 398. Beginning in 2012, GHG allowances were distributed and an auction mechanism was established as a means to monetize those allowances and to purchase additional allowances if needed. The District participates in the auctions to acquire allowances to support wholesale sales. The District’s resource plans reflect likely regulatory scenarios
and the expectation that the District may need to purchase some allowances as the number of allowances allocated to it decreases. However, at this time the District reports that it does not foresee any issues to comply with its GHG requirements nor will it incur significant compliance costs through 2024.

The time consuming process of reporting GHG emissions to the CARB, and complying with regulations continues. The District expects the CARB to refine its policies, practices, and regulations, however it anticipates continued uncertainty as to the cap and trade market and surrounding regulatory environment.

**Assembly Bill 2514**

Assembly Bill 2514 (AB 2514) is a California state law that requires POUs to determine if it is appropriate to establish procurement targets for energy storage based on a determination of viability and cost effectiveness. To comply with AB 2514, the District prepared a report submitted to the CEC in September 2014 that assessed and modeled scenarios involving the addition of various energy storage technologies, namely lithium ion batteries, flywheels and thermal storage systems. The study concluded that the benefits of deploying storage systems on the District’s system did not exceed the capital costs of the various systems currently and that the District should not adopt procurement targets at this time. However the District stated that it believes energy storage could eventually become cost-effective in the future and that it intends to re-evaluate the efficacy of energy storage on its system periodically. An updated study was presented to the TID Board and submitted to the CEC in September 2017. Although the updated study identified certain storage applications to be cost effective, it was noted that certain assumptions used in the study may change in the near future that could affect the results of the study and that storage costs are projected to decline substantially in the near future. Due to the noted items, the District did not adopt energy storage at this time but plans to continually evaluate energy storage systems in the future.

**Senate Bill 350**

Senate Bill 350 (SB 350) became law on October 7, 2015 which among other things requires the governing board of POUs, with an annual electric demand exceeding 700 GWh of load, determined on a three-year average as of 2013, to adopt an integrated resource plan (IRP) by January 1, 2019 and a process for updating the plan at least once every five years. The plan needs to ensure 1) that the utility achieves the GHG emissions reduction targets established by the CARB, 2) ensure procurement of at least 50% renewable resources by 2030, 3) just and reasonable rates, 4) minimize impact on ratepayer bills, 5) system and local reliability, 6) the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities, 7) enhancement of the distribution systems and demand-side energy management, and 8) minimize local air pollutants and greenhouse gas emissions, with early priority on disadvantage communities. Furthermore, the plan must address the following: 1) energy efficiency and demand response requirements pursuant to Section 9615 of the CA PUC, 2) the energy storage mandates pursuant to Chapter 7.7 of the CA PUC, 3) transportation electrification, 4) the diversity of the utility’s procurement portfolio, and the 5) resource adequacy requirements pursuant to Section 9620 of the CA PUC. SB
350 also requires the POU to submit the adopted IRP to the CEC for review to ensure it meets the requirements of the SB 350. As provided for in SB 350 the CEC adopted guidelines to govern the submission of the IRP. On December 4, 2018 the TID Board adopted an IRP for the period 2018-2030 that addresses all the requirements described above which was submitted to the CEC on April 25, 2019 in compliance with the CEC guidelines. On December 11, 2019, the CEC Commission approved the CEC Executive Director’s determination that TID’s IRP was determined to be consistent with the requirements of SB 350.

Energy Imbalance Market

TID is in the process of implementing the software, processes, and training to enable participating in the Western Energy Imbalance Market (EIM). The EIM would enable TID to automate transactions in the intra-hour energy imbalance market that currently includes over 75% of the Western Interconnection. A Board workshop was held on (or about) January 17, 2017, regarding the market. Preliminary analysis indicate that annual savings could be on the order of $1 million, with start-up costs less than $2 million. It was concluded that TID should refine the estimate of projected production cost benefits, review in greater detail the investments and other costs related to participating in the market, look for opportunities to coordinate with other entities to lower costs and put TID in a position where it could be prepared to join the EIM as early as 2020. TID Staff updated the 2017 analysis, which shows estimated benefits of around $2.2 million annually, with an estimated cost of $5 million. A board workshop was conducted on March 19, 2019. On March 26, 2019, the Board adopted Resolution 2019-12, authorizing the execution of Agreements and the appointment of a Project Manager necessary for preparing the District for participation in the EIM, which went live March 25, 2021.

Other Issues

Strategic Plan

In 2015, TID prepared a Strategic Plan that, among other things, defined a vision of core values to guide the organization going forward. The Plan also detailed the results of a ‘SWOT’ analysis (i.e. strengths, weaknesses, opportunities and threats) and established five separate operating strategies in the areas of water and electric supply and distribution, finance and rates, workforce, customer service and government/community relations. In 2019, TID Staff held a strategic planning workshop with the Board to facilitate a new strategic plan. Subsequent to this workshop, staff has developed a draft 2020-2025 strategic plan, which was presented to and adopted by the Board of Directors on September 1, 2020.

Debt Ratings

In October 2020, the District issued approximately $137.2 million in revenue refunding bonds, Series 2020. In preparation for this issuance Standard & Poor’s and Fitch Ratings
reaffirmed TID’s credit worthiness as an AA- rating. The issuance resulted in substantial savings.

**Debt Policy**

In February 2018, the District formalized and adopted its Debt Policy. The purpose of the Policy is to identify debt policy objectives, improve the quality of decision-making processes, provide a basis for the determination of the appropriate debt structures and to demonstrate a commitment to best practices in debt management planning and execution. The District is required to have an adopted debt policy under California law, SB 1029.

**Staffing**

As is the case with many electric utilities, the District must plan for maintaining and expanding its electric system operations and maintenance workforce. Many in the current workforce are approaching retirement and the competition for trained workers is challenging. To meet the challenge, the District monitors employee status and has recruited qualified candidates into both professional positions and the District’s apprentice program.

**Risk Management**

In late 2001, the Board adopted a risk management policy that defines internal policies and procedures for monitoring and controlling the exposure to the volatility of the wholesale power and natural gas markets. This policy has been implemented and has helped the District manage its exposure to the volatility of the wholesale power and natural gas markets. The policy sets limits on the volume of purchases that can be exposed to market forces during the upcoming twelve-month period, and also establishes a Value at Risk limit which further limits TID’s exposure to market forces. The District continues to review this policy for necessary improvements.

Each month, the District updates its monthly operating plan to supply anticipated firm commitments (including native load) for the balance of the current year and the next calendar year. In doing so, the District continually makes purchases or sales as necessary to stay within the bounds of its Risk Policy. Throughout 2020, TID remained in compliance with its Risk Policy and Procedures. The requirements to hedge purchases of gas and power, under those procedures reduced the effect of volatility in the gas and power prices on TID.

TID has always recognized that locking in future costs can be disadvantageous in a declining market but advantageous in a rising market and results in a more stable cost in the long run. The District continues to investigate the advantages of longer-term gas arrangements in order to provide more cost certainty and to continue to employ a variety of hedging tools, such as the purchase of options, in order to mitigate the effects of wide market changes.
Additionally, the District has, in conjunction with certain members of the Southern California Public Power Authority, acquired a share of natural gas leases and production facilities in Wyoming and Texas to help manage the cost of natural gas supply. Gas is sold in the markets where it is produced and revenues are used as a hedge against gas purchased for District power plants. Some of these leases also produce oil and natural gas liquids, which has allowed the District to benefit from the high prices for such fuels. In addition to the gas coming from the natural gas leases, the District regularly hedges its anticipated natural gas requirements through purchases in the wholesale markets. At the beginning of the year in 2020, the District was hedged about 85 percent of the total power supply requirements including gas supply requirements for generation to serve the District’s retail load for the ensuing year. At the end of 2020, the District was hedged about 76 percent for the ensuing 12 months.

TID also uses gas storage to manage its fuel costs. TID has long-term rights to store up to 200,000 MMBtu and to call on that gas when daily market prices warranted. Usually, gas is put into storage in the low demand months of April and May and then taken out of storage in the winter. However, the storage is also helpful when there are limitations in the gas transportation system; at those times the storage can be used to balance the daily gas needs of the generation.

**Cyber Security**

Compliance standards and cybersecurity best practices are approaches that TID utilizes to reduce and prevent cybersecurity threats. Automated security patch management programs are in place to keep operating systems and software applications up to date. These updates are completed on a monthly bases and monitored to ensure successful deployed.

TID’s registered function as part of the electric grid mandates adherence to North American Electric Reliability Corporation (NERC) standards. NERC Critical Infrastructure Protection (CIP) standards are sets of baseline requirements meant to ensure appropriate measures are in place to protect the bulk electric system.

TID also maintains compliance to the Payment Card Industry (PCI) standard to protect customer payment information.

TID cybersecurity team regularly meet to discuss security threats and risks to the District. TID’s Cybersecurity team also monitors upcoming new compliance standards and changes to existing standards.

Utilities across the country are becoming increasingly concerned about the vulnerability of their infrastructure to cyber-related threats. The District further reports that during 2020 there were no significantly adverse effects from cyber-related attacks.

**Enterprise Risk Management**

In an effort to effectively manage risk TID is implementing an integrated enterprise risk management program. The program will incorporate a consistent approach to risk management into the culture and strategic planning processes of the District that
supports decision making and resource allocation. The program will identify, assess, and monitor risks in a variety of categories that impact the District’s mission, including strategic, financial, operational, legislative, regulatory and reputational risk.

**Emergency Preparedness**

TID created an Emergency Preparedness Department to provide a comprehensive and integrated emergency management culture that coordinates District resources and creates partnerships with public and private agencies to protect lives, property and the environment through preparedness, protection, response, mitigation and recovery. This department’s responsibilities include drafting, updating, training and exercising Emergency Operations Plans (EOPs) and Incident Action Plans (IAPs) in order to respond to emergencies.

TID follows the National Incident Management System (NIMS), the California Standardized Emergency Management System (SEMS). The District uses an adapted Incident Command System (ICS) for all incident activations. The ICS system provides standardization and is quickly scalable to meet the changing needs of the incident.

TID was able to successfully respond to and mitigate the impacts of a wildfire in the Del Puerto Canyon in August of 2020, because of its resilient Emergency Management Program and its Wild Fire Mitigation Program (noted under Distribution Reliability section). We were fully restored within 2 weeks.

**Long Term Financial Plan**

In 2019 the District deployed a long-term financial model to provide insight into the business decisions and choices the District will face in the next twenty years. The model allows for scenario development and illustrates the financial repercussions of various financial decisions on the health of the District in the long-term. This information is invaluable in determining appropriate capital plans, resource allocation, debt and treasury levels.

**Customer to Meter (C2M)**

In 2020 the District went live with the replacement to its legacy utility billing software program, marking the culmination of a multi-year, cross organization effort. The new software includes a state of the art Oracle Customer Information System, Meter Data Management, and other modules that are collectively called the C2M project. This project will act as the foundation for future customer focused technology enhancements such as Customer Self Service.
Findings and Conclusions

On March 18, 2021, Leidos conducted its annual interviews with the District, wherein current and future operations were discussed with District staff and managers. Based on our observations, our inquiries about the systems, and certain information about the systems provided to us by the District, we believe that the observations, the responses to inquiries, and the information to be reliable. Furthermore, we believe the use of such information is reasonable for the purposes of this report.

We find both the District’s irrigation and power system facilities are capable of meeting current demand. We find that the District is responding to irrigation issues by managing their storage and delivery systems to provide customers with reliable service, and by monitoring and participating, as necessary, within the regulatory environment to assure compliance with a complex array of laws, ordinances, regulations, and standards. We find that the District is responding to continuing changes in the electric industry by broadening its services; by planning for new conventional and renewable generation; making use of improved technologies; addressing issues stemming from customer-sited solar and structuring its operations to enhance efficiency and reliability. The District has enhanced its public benefits programs and retained its competitive position in its retail supply of electricity. From our review of the District’s operations contained herein, we are of the opinion that the District maintains and operates the irrigation and electric systems consistent with prudent utility practices. Financial planning should continue to recognize market price volatility and uncertainties with respect to laws and regulations to limit GHG emissions, to conserve water and electricity, and to manage short- and long-term debt. In the near term, the District will need to address the ongoing impacts of varying rainfall and the resultant impacts on the net purchase/sale of power supply. Additionally, increased competition from third party solar providers should be monitored. The District should continue to set retail electric rates to recover electricity costs and not rely on wholesale spot sales activities to support the core retail electricity business. We recommend that the District continue to maintain its operations and maintenance programs in accordance with sound engineering principles and to clearly define internal strategies and to apply sound risk management to hedge against net revenue volatility during that period when the District’s plants and contracts together are producing surplus energy and capacity.