City of SACRAMENTO

Appendix for Draft Environmental Impact Report

City of Sacramento Groundwater Master Plan Well Replacement Program

SCH # 2022030709

April 2023

PREPARED BY:
City of Sacramento
Department of Utilities
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Sacramento, CA 95822

WITH ASSISTANCE FROM:
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APPENDIX A - NOTICE OF PREPARATION AND SCOPING REPORT

City of SACRAMENTO
Community Development

300 Richards Boulevard, Third Floor
Sacramento, CA 95811

DATE: March 25, 2022

TO: Interested Persons

FROM: Scott Johnson, Senior Planner
Community Development Department

RE: NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT AND SCOPING MEETING FOR THE GROUNDWATER MASTER PLAN WELL REPLACEMENT PROGRAM

COMMENT PERIOD: March 25, 2022 through April 25, 2022

SCOPING MEETING: April 13, 2022

INTRODUCTION

Pursuant to section 21166 of the California Public Resources Code and section 15162 of the California Environmental Quality Act (CEQA) Guidelines, the City is the Lead Agency for preparation of a Program Environmental Impact Report (Program EIR) for the proposed City of Sacramento Groundwater Master Plan Well Replacement Program.

The Program EIR is being prepared in compliance with the California Environmental Quality Act. The City, as Lead Agency, is issuing this Notice of Preparation (NOP) to inform trustee and responsible agencies, as well as the public, of its decision to prepare a Program EIR for the City of Sacramento's Groundwater Master Plan Well Replacement Program. The purpose of the NOP is to provide information describing the projects and their potential environmental effects to those who may wish to comment regarding the scope and content of the information to be included in the Program EIR. Agencies should comment on such information as it relates to their statutory responsibilities in connection with the project.

SUBMITTING COMMENTS

Comments and suggestions as to the appropriate scope of analysis in the Program EIR are invited from all interested parties. Written comments or questions concerning the Program EIR for the proposed project should be directed to the environmental project manager at the following address by 5:00 p.m. on April 25, 2022. Please include the contact person's full name and address in order for staff to respond appropriately:

Scott Johnson, Senior Planner
City of Sacramento Community Development Department
300 Richards Blvd., Third Floor
Sacramento, CA 95811
Telephone: (916) 808-5842
E-mail: srjohnson@cityofsacramento.org

SCOPING MEETING

A public scoping meeting will be held on April 13, 2022, from 12:00 p.m. to 1:00 p.m. via the following Zoom link: https://cityofsacramento-org.zoom.us/webinar/register/WN_dOhBh888R6ahFqBmp2XWqQ, or by phone at (669) 900-6833 (Webinar ID 942 7841 6721).

Responsible agencies and members of the public are invited to attend and provide input on the scope of the Program EIR. There will be a presentation by the City to introduce the proposed project, followed by an opportunity for public comment.

PROJECT LOCATION/SETTING

The proposed Project is the replacement of 38 groundwater wells throughout the City of Sacramento. The replacement well locations are at sites within residential, commercial, and industrial areas, schools, parks, and existing public facilities (such as existing City well sites, water storage facilities, and water treatment facilities). Figure 1 is an overview map of the well sites and Table 1 lists each proposed location. Appendix A of the CEQA Initial Study, provided at the City's website link provided on page 3 of this NOP, shows maps and well site layouts for each of the 38 well sites.

PROJECT PURPOSE

The purpose of the proposed Well Replacement Program is to replace City municipal wells that are at the end of their useful life. Due to climate change, extremely dry years are expected to be more frequent and intense, and maintaining the City's capability to extract groundwater more reliably will allow the City to diversify its water supply portfolio. In addition, the frequency of wildfires within the upstream watershed is causing surface water treatment challenges. Climate and regulatory changes may impact future availability of surface water, and reliable groundwater supply is needed to ensure long-term sustainability of both supplies. For these reasons, the City is also supporting and participating in regional conjunctive use programs that store and manage groundwater to improve long-term water supply reliability in the region.

PROJECT DESCRIPTION

The Well Replacement Program involves the long-term (up to 15 years or potentially longer) replacement of up to 38 municipal groundwater wells that are at or near the end of their useful life. The program is an outgrowth of the City's *Groundwater Master Plan* and identifies where, when, and how certain municipal production wells should be replaced, given current economic, regulatory and water quality constraints as well as variations in hydrologic and climate conditions affecting reliability of the City's surface water supply. Replacement wells are located within the City's water service area, which overlies the North American and South American Subbasins of the Sacramento Valley Groundwater Basin. Replacement planning was found to be necessary because many of the current well locations are too small to accommodate same-site well replacement, and groundwater quality concerns may affect the ability to use many of the City's existing wells. As such, new locations are required for most replacement wells. An example of a proposed well site layout for construction is shown in Figure 2 and an example of an existing well site is shown in Figure 3.

The proposed Project includes the construction, operation and long-term maintenance of 38 wells, including above-ground wellhead facilities, such as pumps and a chlorination/ fluoridation system housed within a one-story concrete block wall structure, as well as below ground sanitary sewer and drinking water distribution system connections. Replacement wells would be constructed to produce approximately 1,250 gallons per minute of groundwater when in full operation. Wells in areas with groundwater quality concerns would require the construction and operation of necessary treatment systems. The Project also includes destruction of the 38 existing City wells and would take place after the replacement well is fully operational.

ENVIRONMENTAL EFFECTS AND SCOPE OF THE PROGRAM EIR

The Program EIR will focus on environmental resource topics that were found to be potentially significant in the CEQA Initial Study. The following resource topics will be analyzed in the Program EIR: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Transportation and Traffic, and Tribal Cultural Resources. The Program EIR will include a section on effects found not to be significant that will describe the resource topics that were identified by the CEQA Initial Study as having no impacts or less than significant impacts, which will not be further addressed in the Program EIR. These topics are Agricultural and Forestry Resources, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Utilities and Service Systems, and Wildfire. Potential cumulative impacts and potential for growth inducement will be evaluated as well as alternatives to the proposed Project including the No Project Alternative.

Environmental documents related to the project may be reviewed on the Utilities Department web site at: http://www.cityofsacramento.org/Utilities/Water/Current-Projects/Groundwater-Well-Replacement

And on the Community Development Department, Environmental Impact Report webpage at: https://www.cityofsacramento.org/Community-Development/Planning/Environmental/Impact-Reports

Table 1: Replacement Well Locations and Attributes

Replacement Well Number[1]	City's Existing Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 1	Well 112B	Residential; Mark Hopkins Elementary School	South American	1,250	350
Well 2	Well 138B	Residential; William G Chorley Park	South American	1,250	350
Well 3	Well 114B	Mixed use residential and commercial; Collis P Huntington Elementary School	South American	1,250	350
Well 4	Well 94B	Residential; North end of Tahoe Park near baseball diamonds	South American	1,250	350
Well 5	Well 146B	Residential; Glenn Hall Park near Glenn Hall Pool	South American	1,250	350
Well 6	Well 151B	Residential; Glenbrook Park	South American	1,250	350
Well 7	Well 155B	Commercial; Granite Regional Park	South American	1,250	397
Well 8	Well 127B	Residential; Camellia Park	South American	1,250	350
Well 9	Well 93B	Mixed use residential and commercial; Danny Nunn Park	South American	1,250	350
Well 10	Well 123B	Residential; Grant Union High School	North American	1,250	370
Well 11	Well 131B	Residential; Robla Reservoir	North American	1,250	500
Well 12	Well 120B	Commercial; near 43rd Avenue and 88th Street	South American	1,250	350
Well 13	Well 144B	Commercial; end of Asher Lane off of Elder Creek Road	South American	1,250	350

[1]Replacement well numbering is based on a prioritization of the top 10 wells needing replacement, followed by sequential number for the remaining wells. Also, note Well 18 does not exist due to a typo in the City's *Groundwater Master Plan* (2017).

Replacement Well Number[1]	City's Existing Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 14 [2]	Well 167	Mixed use residential & commercial; 2nd well at Shasta Reservoir	South American	1,250	1,200
Well 15	Well 92B	Residential; Fong Ranch Road near Discovery High School	North American	1,250	400
Well 16	Well 91B	Mixed use residential and commercial; 66th Street Fire Station	South American	1,250	350
Well 17	Well 111B	Residential; Johnston Park	North American	1,250	400
Well 19	Well 109B	Residential; Elkhorn Tank Site	North American	1,250	600
Well 20	Well 125B	Residential; El Centro Tank Site	North American	1,250	600
Well 21	Well 129B	Mixed use residential and commercial; near intersection of Rio Linda Blvd and Altos Ave	North American	1,250	300
Well 22	Well 124B	Mixed use residential and commercial; Robertson Park	North American	1,250	308
Well 23	Well 159B	Residential; Gardenland Park	North American	750	375
Well 24	Well 139B	Commercial; near intersection of Commerce Circle and Lathrop Way	North American	1,250	255
Well 25	Well 156B	Commercial; Fee Drive near Tribute Road	North American	1,250	380
Well 26	Well 134B	Residential; near intersection of Bell Ave and Baumgart Way	North American	1,250	513
Well 27	Well 126B	Residential; Hagginwood Park	North American	1,250	432

[2] The second well at the Shasta Reservoir site (Well 167) has been installed, but is not yet operational, and is thus being addressed in this document only for operational impacts.

Replacement Well Number[1]	City's Existing Well Number	Location Description	Subbasin	Well Capacity (gallons per minute [gpm])	Well Depth (feet)
Well 28	Well 154B	Mixed use residential and commercia; near intersection of Dry Creek Road and Ascot Drive	North American	1,250	1,000
Well 29	Well 133B	Mixed use residential and commercial; Located behind 4590 Pell Drive	North American	1,250	514
Well 30	Well 143B	Mixed use residential and commercial; near intersection of Acacia Ave and Rio Linda Blvd	North American	1,250	330
Well 31	Well 122B	Mixed use residential and commercial; near intersection of Del Paso Blvd and Juliesse Ave	North American	1,250	422
Well 32	Well 137B	Residential; near intersection of Del Paso Blvd and Los Robles Blvd	North American	1,250	1,000
Well 33	Well 107B	Residential; Rio Cazadero High School	South American	1,250	350
Well 34	Well 158B	Commercial; Sacramento Fire Department Station 19	North American	1,250	318
Well 35	Well 110B	Commercial; 2nd well at Granite Regional Park	South American	1,250	350
Well 36	Well 141B	Mixed use residential and commercial; 2nd well at Danny Nunn Park	South American	1,250	350
Well 37	Well 157B	Commercial; 2nd well near 43rd Avenue and 88th Street	South American	1,250	350
Well 38	Well 142B	Commercial; 2nd well at E.A. Fairbairn Water Treatment Plant	South American	3,000	314
Well 39	Well 116B	Mixed use commercial and residential; Capitol Gateway Reservoir well	North American	1,250	400

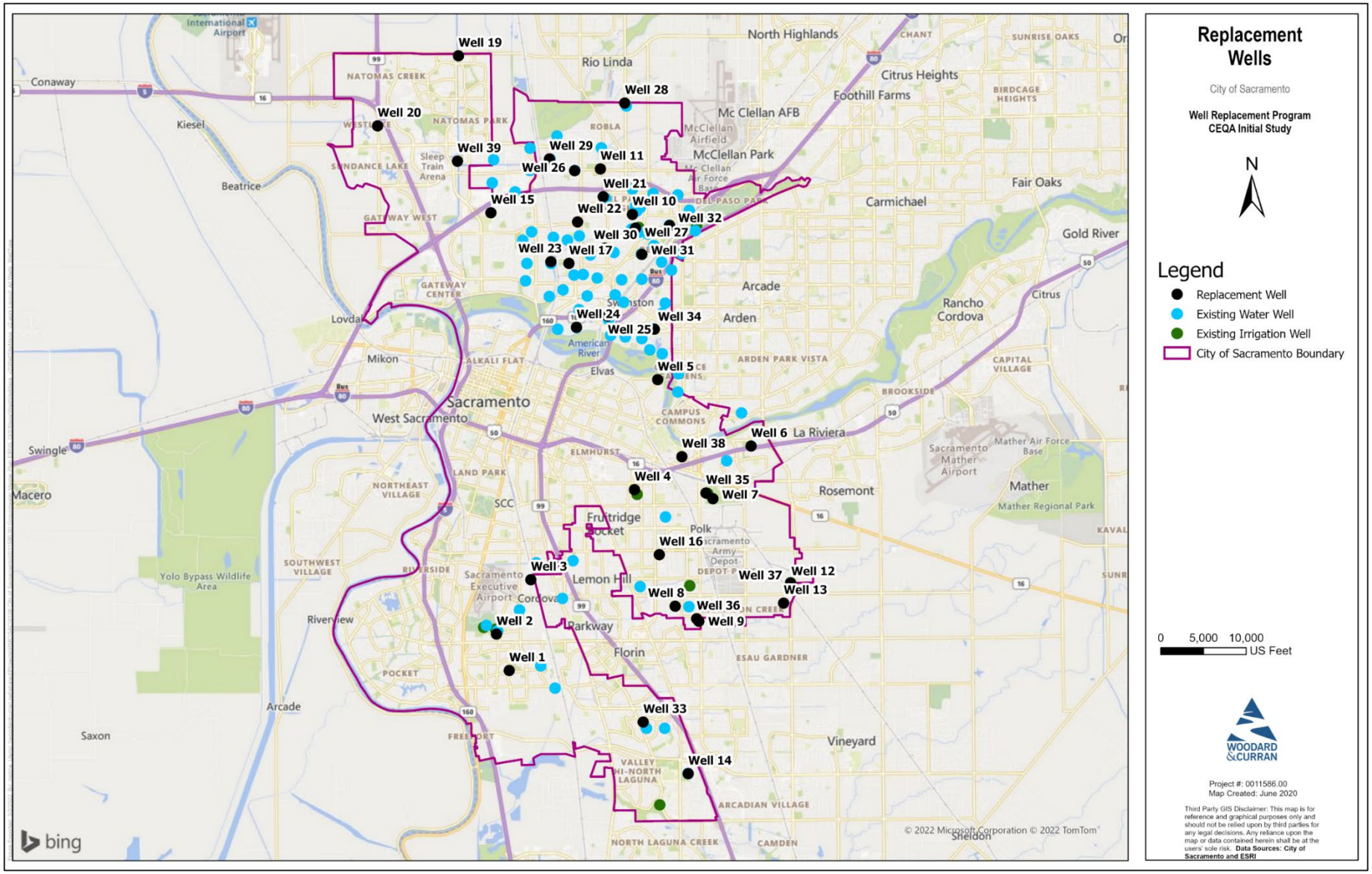

Figure 1: Replacement Well Locations

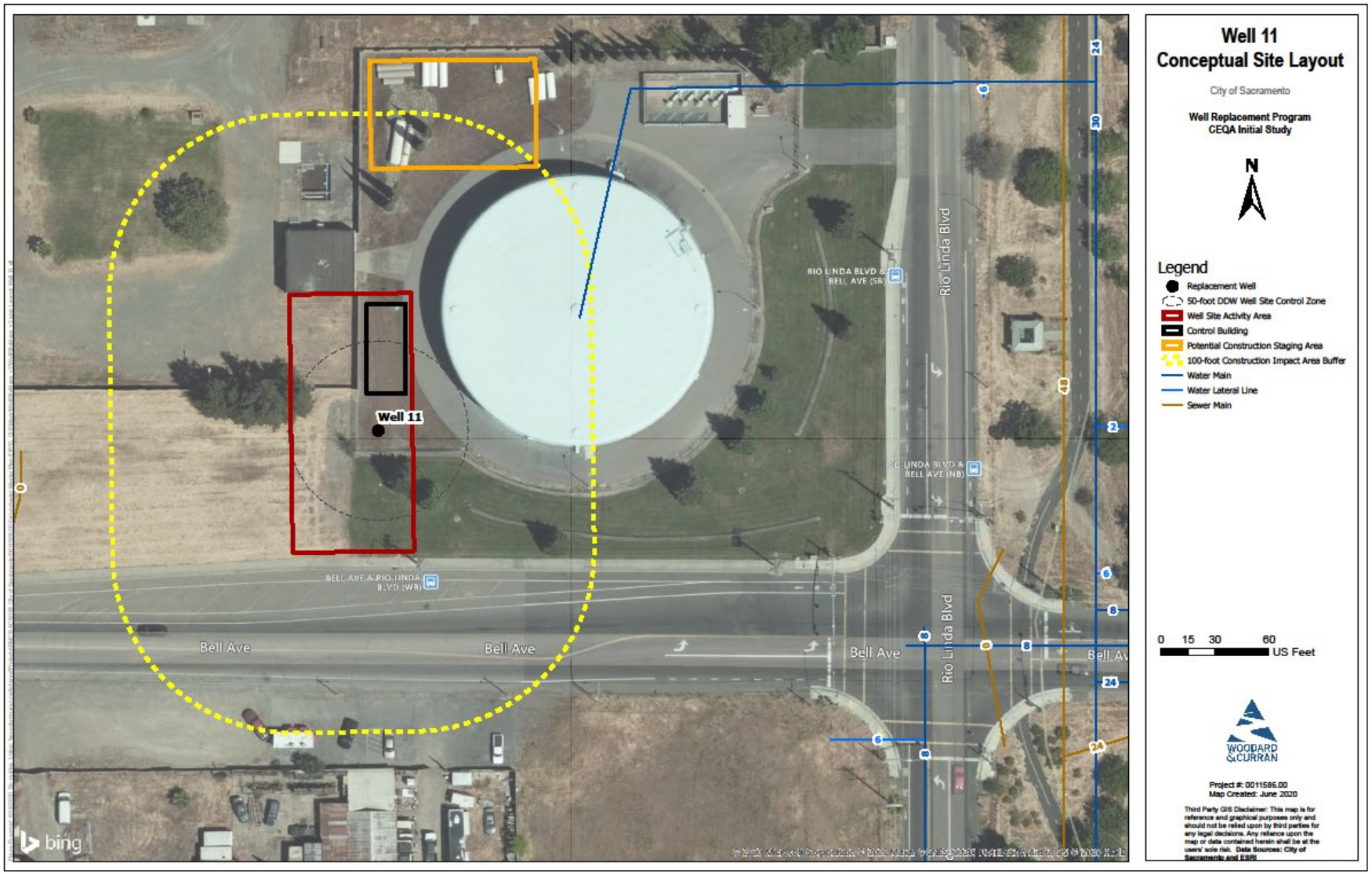

Figure 2: Example of Proposed Well Facility Layout for Construction

Figure 3: Example of an Existing Well Site

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MEMORANDUM

TO: Kathy Sananikone and Scott Johnson, City of Sacramento

FROM: Melissa Stine and Jennifer Ziv, Woodard & Curran

DATE: July 19, 2022

RE: Scoping Report for Groundwater Master Plan Well Replacement Environmental Impact Report

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This Scoping Report has been prepared to summarize the scoping process completed for the City of Sacramento Groundwater Master Plan Well Replacement Program (Project) Environmental Impact Report (EIR). It provides an overview of the scoping process completed for the California Environmental Quality Act (CEQA) and summarizes the comments received during scoping.

1. CEQA SCOPING PROCESS

The City of Sacramento, the CEQA Lead Agency, circulated a Notice of Preparation (NOP) on March 25, 2022. The NOP began a 30-day public review period, which ended April 25, 2022. The NOP was submitted to the State Clearinghouse through the CEQAnet website and emailed directly to responsible and trustee agencies. Letters announcing the availability of the NOP and date of the scoping meeting was mailed to residents living within 500 feet of the Project sites. An announcement of the availability of the NOP and the date and time of the scoping meeting was posted in The Sacramento Bulletin. The NOP, Initial Study, and the data and time of the scoping meeting were also posted at the Sacramento County Clerk-Recorder's Office and on the City's website.

A publicly advertised scoping meeting was held on April 13, 2022 from 12:00 p.m. to 1:00 p.m. via zoom. The public could join through the zoom link https://cityofsacramento-org.zoom.us/webinar/register/WN_dOhBh888R6ahFqBmp2XWqQ, or by phone (669) 900-6833 (Webinar ID 942 7841 6721).

The scoping meeting was held in an open house format where attendees of the meeting would submit questions or comments through the zoom chat function. Attendees joining by phone had to submit questions or comments through mail or email. Because of the format of the meeting there were no verbal comments.

2. COMMENT SUMMARY

A total of eight comment submittals (letters and meeting chat comments) were received in response to the Notice of Preparation. Comment submittals are included in Attachment A. Table 1 provides a summary of the comments received during the

public scoping process, and identifies the commenter, affiliation, date and comment format, summary of comments, and disposition of each comment. All commenters who submitted letters will be added to the mailing list for the project and kept informed about opportunities for public input.

Table 1: Scoping Comment Summary

Commenter, Affiliation	Format, Date	Comments	Response
Nelly Ramos, City Resident	Scoping Meeting Chat, April 13, 2022	Well site 20 is on the other side of our fence	This is not a comment pertinent to the analysis to be conducted in the EIR.
		Where do we look for information as it becomes available?	Notifications and information will be available through the City's website
		Will there be noise and insect displacement?	Noise impacts will be analyzed in the Noise section of the EIR. Insect displacement will be analyzed in the ---Hazards and Hazardous Materials section of the EIR. During the scoping meeting noise analysis from the initial study was discussed to inform resident of potential noise from Project construction.
		Will there be foundation shifting on our home?	During the scoping meeting staff informed the resident that there is very low potential for foundation shifting on the home. Vibrations from well drilling are not known to cause or have the potential to cause foundation shifting.
Native American Heritage Commission	Letter, April 14, 2022	AB 52 applies to the project	Letters have been sent to Native American tribes traditionally affiliated with the project area to determine concerns about the project. A tribal consultation is in progress. The EIR will

Commenter, Affiliation	Format, Date	Comments	Response
			also evaluate impacts on tribal cultural resources.
		SB 18 applies to the local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space.	The project does not involve a general plan or specific plan amendment or designation of open space.
		NAHC provides recommendations for cultural resources assessments	The analysis of cultural resources impacts has been done in accordance with the NAHC recommendations.
Central Valley Regional Water Quality Control Board	Letter, April 26, 2022	All wastewater discharges must comply with the Antidegradation Policy	The project does not include wastewater discharges to groundwater or surface water.
		Projects that disturb one or more acre of soil are subject to Construction Storm Water General Permit	This requirement will be addressed in the Hydrology and Water Quality section of the EIR.
		New development must reduce pollutants and runoff flows using Best Management Practices in accordance with MS4 Permits	This requirement will be addressed in the Hydrology and Water Quality section of the EIR.

Commenter, Affiliation	Format, Date	Comments	Response
		Storm water discharges from industrial sites must comply with the Industrial Storm Water General Permit	Proposed Project facilities are not expected to require coverage under the Industrial Storm Water General Permit.
		If the project will involve discharge of fill material in navigable waters or wetlands, a Section 404 Permit would be needed	The Project is not expected to involve discharge of fill material in navigable waters or wetlands or require a Section 404 Permit.
		If a 404 Permit is required, then a Water Quality Certification would be needed from the Regional Board	The Project is not expected to require a Water Quality Certification.
		If there is fill in a non-jurisdictional water of the state, the project would require a Waste Discharge Requirement (WDR) permit	The Project is not expected to fill in a non-jurisdictional water of the state or require a Waste Discharge Requirement permit.
		Discharge of water from construction dewatering would need to be covered under the Low or Limited Threat General NPDES Permit	This requirement will be addressed in the Hydrology and Water Quality section of the EIR.
		If the project discharges waste that could affect the quality of surface waters a National Pollutant Discharge Elimination System permit would be required.	This requirement will be addressed in the Hydrology and Water Quality section of the EIR.

Commenter, Affiliation	Format, Date	Comments	Response
Department of Toxic Substances Control	Letter, April 13, 2022	Identify the mechanism(s) to initiate any required investigation and/or remediations and the government agency who will be responsible for providing appropriate regulatory oversight	This will be addressed in the Hazards and Hazardous Materials section of the EIR.
		Due to the potential for ADL-contaminated soil DTSC recommends collecting soil samples for lead analysis prior to performing any intrusive activities for the project.	This will be addressed in the Hazards and Hazardous Materials section of the EIR.
		Any sites with current and/or former mining operations onsite or in the project site area should be evaluated for mine waste according to DTSC's 1998 *Abandoned Mine Land Mines Preliminary Assessment Handbook*.	The initial study for the Project determined the Project sites would not be on or within current and/or former mining operations.
		Proper sampling should be conducted to ensure any imported soil used to backfill any excavated areas are free of contamination according to DTSC's 2001 *Information Advisory Clean Imported Fill Material*.	This will be addressed in the Hazards and Hazardous Materials section of the EIR.
		Current and former agricultural lands should be evaluated in accordance with DTSC's 2008 *Interim Guidance for Sampling Agricultural Properties (Third Revision)*.	This will be addressed in the Hazards and Hazardous Materials section of the EIR.

Commenter, Affiliation	Format, Date	Comments	Response
California Department of Fish and Wildlife	Letter, April 20, 2022	An assessment of all habitat types located within the Project footprint, and a map that identifies the location of each habitat type. Adjoining habitat areas should also be included in this assessment where site activities could lead to direct or indirect impacts offsite.	This will be addressed in the Biological Resources section of the EIR.
		A general biological inventory of the fish, amphibian, reptile, bird, and mammal species that are present or have the potential to be present within each habitat type onsite and within adjacent areas that could be affected by the Project.	This will be addressed in the Biological Resources section of the EIR.
		A complete and recent inventory of rare, threatened, endangered, and other sensitive species located within the Project footprint and within offsite areas with the potential to be affected, including California Species of Special Concern and California Fully Protected Species (Fish & G. Code § § 3511, 4700, 5050, and 5515). Species to be addressed should include all those which meet the CEQA definition (CEQA Guidelines § 15380). The inventory should address seasonal variations in use of the Project area and should not be limited to resident species. The EIR should include the results of focused species-specific surveys, completed by a qualified biologist and	This will be addressed in the Biological Resources section of the EIR.

Commenter, Affiliation	Format, Date	Comments	Response
		conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable. Species-specific surveys should be conducted in order to ascertain the presence of species with the potential to be directly, indirectly, on or within a reasonable distance of the Project activities.	
		A thorough, recent (within the last two years), floristic-based assessment of special-status plants and natural communities, following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*.	This will be addressed in under the Biological Resources section of the EIR.
		Information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region (CEQA Guidelines § 15125[c]).	This will be addressed in the Biological Resources section of the EIR.
		The EIR should provide a thorough discussion of the Project's potential direct, indirect, and cumulative impacts on biological resources.	This will be addressed in the Biological Resources section of the EIR.
		The EIR should include appropriate and adequate avoidance, minimization, and/or mitigation measures for all direct, indirect, and cumulative impacts that are expected to occur as a result of the construction and long-term operation and maintenance of the Project.	This will be addressed in the Biological Resources section of the EIR.

Commenter, Affiliation	Format, Date	Comments	Response
		Analyze impacts of GWMP implementation under the lens of established groundwater thresholds for each subbasin.	This will be addressed in the Hydrology and Water Quality section of the EIR.
		Identify mitigation measures that include identification and/or installation of monitoring wells to substantiate modeled projections for aquifer interactions during and after project implementation so as to identify when wells, individually or collectively, may be depleting shallow groundwater resources.	This will be addressed in the Hydrology and Water Quality section of the EIR.
		Compare groundwater extraction capacity and volume versus anticipated groundwater extraction capacity and volume under the replaced groundwater well regime.	This will be addressed in the Hydrology and Water Quality section of the EIR.

Attachment A

Scoping Comment Letters

NATIVE AMERICAN HERITAGE COMMISSION

April 14, 2022

Scott Johnson
City of Sacramento
300 Richards Boulevard, Third Floor
Sacramento, CA 95811

Re: 2022030709, Groundwater Master Plan Well Replacement Project, Sacramento County

Dear Mr. Johnson:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).

2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.

3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).

4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:

- **a.** The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
- **b.** Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:

- **a.** If part or all of the APE has been previously surveyed for cultural resources.
- **b.** If any known cultural resources have already been recorded on or adjacent to the APE.
- **c.** If the probability is low, moderate, or high that cultural resources are located in the APE.
- **d.** If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- **a.** The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
- **b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Pricilla.Torres-Fuentes@nahc.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

cc: State Clearinghouse

26 April 2022

Scott Johnson
City of Sacramento
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srjohnson@cityofsacramento.org

COMMENTS TO REQUEST FOR REVIEW FOR THE NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, GROUNDWATER MASTER PLAN WELL REPLACEMENT PROGRAM, SCH#2022030709, SACRAMENTO COUNTY

Pursuant to the State Clearinghouse's 25 March 2022 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Notice of Preparation for the Draft Environmental Impact Report* for the Groundwater Master Plan Well Replacement Program, located in Sacramento County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has

adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), Construction General Permit Order No. 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the

State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage

under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Threat Waiver and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2018-0085.pdf

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4709 or Greg.Hendricks@waterboards.ca.gov.

Greg Hendricks
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Department of Toxic Substances Control

Jared Blumenfeld
Secretary for
Environmental Protection

Meredith Williams, Ph.D.
Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Gavin Newsom
Governor

SENT VIA ELECTRONIC MAIL

April 13, 2022

Mr. Scott Johnson
City of Sacramento
300 Richards Boulevard
Sacramento, California 95811
SRJohnson@cityofsacramento.org

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE GROUNDWATER MASTER PLAN WELL REPLACEMENT PROGRAM – DATED March 25, 2022 (STATE CLEARINGHOUSE NUMBER: 2022030709)

Dear Mr. Johnson:

The Department of Toxic Substances Control (DTSC) received a Notice of Preparation of an Environmental Impact Report (EIR) for the Groundwater Master Plan Well Replacement Program (Project). The Lead Agency is receiving this notice from DTSC because the Project includes one or more of the following: groundbreaking activities, work in close proximity to a roadway, work in close proximity to mining or suspected mining or former mining activities, importation of backfill soil, and/or work on or in close proximity to an agricultural or former agricultural site.

DTSC recommends that the following issues be evaluated in the Hazards and Hazardous Materials section of the EIR:

1. The EIR should acknowledge the potential for historic or future activities on or near the project site to result in the release of hazardous wastes/substances on the project site. In instances in which releases have occurred or may occur, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. The EIR should also identify the mechanism(s) to initiate any required investigation and/or remediation and the government agency who will be responsible for providing appropriate regulatory oversight.

2. Refiners in the United States started adding lead compounds to gasoline in the 1920s in order to boost octane levels and improve engine performance. This practice did not officially end until 1992 when lead was banned as a fuel additive in California. Tailpipe emissions from automobiles using leaded gasoline contained lead and resulted in aerially deposited lead (ADL) being deposited in and along roadways throughout the state. ADL-contaminated soils still exist along roadsides and medians and can also be found underneath some existing road surfaces due to past construction activities. Due to the potential for ADL-contaminated soil DTSC, recommends collecting soil samples for lead analysis prior to performing any intrusive activities for the project described in the EIR.

3. If any sites within the project area or sites located within the vicinity of the project have been used or are suspected of having been used for mining activities, proper investigation for mine waste should be discussed in the EIR. DTSC recommends that any project sites with current and/or former mining operations onsite or in the project site area should be evaluated for mine waste according to DTSC's 1998 Abandoned Mine Land Mines Preliminary Assessment Handbook.

4. If any projects initiated as part of the proposed project require the importation of soil to backfill any excavated areas, proper sampling should be conducted to ensure that the imported soil is free of contamination. DTSC recommends the imported materials be characterized according to *DTSC's 2001 Information Advisory Clean Imported Fill Material*.

5. If any sites included as part of the proposed project have been used for agricultural, weed abatement or related activities, proper investigation for organochlorinated pesticides should be discussed in the EIR. DTSC recommends the current and former agricultural lands be evaluated in accordance with DTSC's 2008 *Interim Guidance for Sampling Agricultural Properties (Third Revision)*.

DTSC appreciates the opportunity to comment on the EIR. Should you need any assistance with an environmental investigation, please visit DTSC's Site Mitigation and Restoration Program page to apply for lead agency oversight. Additional information regarding voluntary agreements with DTSC can be found at DTSC's Brownfield website.

If you have any questions, please contact me at (916) 255-3710 or via email at Gavin.McCreary@dtsc.ca.gov.

Sincerely,

Gavin McCreary
Project Manager
Site Evaluation and Remediation Unit
Site Mitigation and Restoration Program
Department of Toxic Substances Control

cc: (via email)

Governor's Office of Planning and Research
State Clearinghouse
State.Clearinghouse@opr.ca.gov

Mr. Dave Kereazis
Office of Planning & Environmental Analysis
Department of Toxic Substances Control
Dave.Kereazis@dtsc.ca.gov

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 20, 2022

Scott Johnson, Senior Planner
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srjohnson@cityofsacramento.org

Subject: GROUNDWATER MASTER PLAN WELL REPLACEMENT PROGRAM
SCH# 2022030709

Dear Mr. Johnson:

The California Department of Fish and Wildlife (CDFW) received and reviewed the Notice of Preparation of an Environmental Impact Report (EIR) and Initial Study (IS) from the City of Sacrament for the Groundwater Master Plan Well Replacement Program (Project) in Sacramento County pursuant the California Environmental Quality Act (CEQA) statute and guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish, wildlife, plants and their habitats. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may need to exercise its own regulatory authority under the Fish and Game Code (Fish & G. Code).

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (*Id.*, § 1802.). Similarly, for purposes of CEQA, CDFW provides, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

1 CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

CDFW may also act as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (Fish & G. Code, § 2050 et seq.), the project proponent may seek related take authorization as provided by the Fish and Game Code.

PROJECT DESCRIPTION SUMMARY

The proposed Project is the replacement of 38 groundwater wells throughout the City of Sacramento. The replacement well locations are at sites within residential, commercial, and industrial areas, schools, parks, and existing public facilities (such as existing City well sites, water storage facilities, and water treatment facilities).The Well Replacement Program involves the long-term (up to 15 years or potentially longer) replacement of up to 38 municipal groundwater wells that are at or near the end of their useful life. The program is an outgrowth of the City's Groundwater Master Plan and identifies where, when, and how certain municipal production wells should be replaced, given current economic, regulatory and water quality constraints as well as variations in hydrologic and climate conditions affecting reliability of the City's surface water supply. Replacement wells are located within the City's water service area, which overlies the North American and South American Subbasins of the Sacramento Valley Groundwater Basin. Replacement planning was found to be necessary because many of the current well locations are too small to accommodate same-site well replacement, and groundwater quality concerns may affect the ability to use many of the City's existing wells. As such, new locations are required for most replacement wells. The proposed Project includes the construction, operation, and long-term maintenance of 38 wells, including above-ground wellhead facilities, such as pumps and a chlorination/ fluoridation system housed within a one-story concrete block wall structure, as well as below ground sanitary sewer and drinking water distribution system connections. Replacement wells would be constructed to produce approximately 1,250 gallons per minute of groundwater when in full operation. Wells in areas with groundwater quality concerns would require the construction and operation of necessary treatment systems. The Project also includes destruction of the 38 existing City wells and would take place after the replacement well is fully operational.

The Project description should include the whole action as defined in the CEQA Guidelines § 15378 and should include appropriate detailed exhibits disclosing the Project area including temporary impacted areas such as equipment stage area, spoils areas, adjacent infrastructure development, staging areas and access and haul roads if applicable.

As required by § 15126.6 of the CEQA Guidelines, the EIR should include an appropriate range of reasonable and feasible alternatives that would attain most of the

basic Project objectives and avoid or minimize significant impacts to resources under CDFW's jurisdiction.

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations presented below to assist the City of Sacramento in adequately identifying and/or mitigating the Project's significant, or potentially significant, impacts on biological resources. The comments and recommendations are also offered to enable CDFW to adequately review and comment on the proposed Project with respect to impacts on biological resources. CDFW recommends that the forthcoming EIR address the following:

Assessment of Biological Resources

Section 15125(c) of the CEQA Guidelines states that knowledge of the regional setting of a project is critical to the assessment of environmental impacts and that special emphasis should be placed on environmental resources that are rare or unique to the region. To enable CDFW staff to adequately review and comment on the Project, the EIR should include a complete assessment of the flora and fauna within and adjacent to the Project footprint, with emphasis on identifying rare, threatened, endangered, and other sensitive species and their associated habitats. CDFW recommends the EIR specifically include:

1. An assessment of all habitat types located within the Project footprint, and a map that identifies the location of each habitat type. CDFW recommends that floristic, alliance- and/or association-based mapping and assessment be completed following, *The Manual of California Vegetation*, second edition (Sawyer 2009). Adjoining habitat areas should also be included in this assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions.

2. A general biological inventory of the fish, amphibian, reptile, bird, and mammal species that are present or have the potential to be present within each habitat type onsite and within adjacent areas that could be affected by the Project. CDFW recommends that the California Natural Diversity Database (CNDDB), as well as previous studies performed in the area, be consulted to assess the potential presence of sensitive species and habitats. A nine United States Geologic Survey 7.5-minute quadrangle search is recommended to determine what may occur in the region, larger if the Project area extends past one quad (see *Data Use Guidelines* on the Department webpage www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data). Please review the webpage for information on how to access the database to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code, in the vicinity of the Project. CDFW recommends that CNDDB Field Survey Forms be completed and submitted to CNDDB to document survey results. Online forms

can be obtained and submitted at: https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data.

Please note that CDFW's CNDDB is not exhaustive in terms of the data it houses, nor is it an absence database. CDFW recommends that it be used as a starting point in gathering information about the *potential presence* of species within the general area of the Project site. Other sources for identification of species and habitats near or adjacent to the Project area should include, but may not be limited to, State and federal resource agency lists, California Wildlife Habitat Relationship System, California Native Plant Society Inventory, agency contacts, environmental documents for other projects in the vicinity, academics, and professional or scientific organizations.

3. A complete and recent inventory of rare, threatened, endangered, and other sensitive species located within the Project footprint and within offsite areas with the potential to be affected, including California Species of Special Concern and California Fully Protected Species (Fish & G. Code § § 3511, 4700, 5050, and 5515). Species to be addressed should include all those which meet the CEQA definition (CEQA Guidelines § 15380). The inventory should address seasonal variations in use of the Project area and should not be limited to resident species. The EIR should include the results of focused species-specific surveys, completed by a qualified biologist and conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable. Species-specific surveys should be conducted in order to ascertain the presence of species with the potential to be directly, indirectly, on or within a reasonable distance of the Project activities. CDFW recommends the City of Sacramento rely on survey and monitoring protocols and guidelines available at: www.wildlife.ca.gov/Conservation/Survey-Protocols. Alternative survey protocols may be warranted; justification should be provided to substantiate why an alternative protocol is necessary. Acceptable species-specific survey procedures should be developed in consultation with CDFW and the U.S. Fish and Wildlife Service, where necessary. Some aspects of the Project may warrant periodic updated surveys for certain sensitive taxa, particularly if the Project is proposed to occur over a protracted time frame, or in phases, or if surveys are completed during periods of drought or deluge.

4. A thorough, recent (within the last two years), floristic-based assessment of special-status plants and natural communities, following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (see www.wildlife.ca.gov/Conservation/Plants).

5. Information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region (CEQA Guidelines § 15125[c]).

Analysis of Direct, Indirect, and Cumulative Impacts to Biological Resources

The EIR should provide a thorough discussion of the Project's potential direct, indirect, and cumulative impacts on biological resources. To ensure that Project impacts on biological resources are fully analyzed, the following information should be included in the EIR:

1. The EIR should define the threshold of significance for each impact and describe the criteria used to determine whether the impacts are significant (CEQA Guidelines, § 15064, subd. (f)). The EIR must demonstrate that the significant environmental impacts of the Project were adequately investigated and discussed and it must permit the significant effects of the Project to be considered in the full environmental context.

2. A discussion of potential impacts from lighting, noise, human activity, and wildlife-human interactions created by Project activities especially those adjacent to natural areas, exotic and/or invasive species occurrences, and drainages. The EIR should address Project-related changes to drainage patterns and water quality within, upstream, and downstream of the Project site, including: volume, velocity, and frequency of existing and post-Project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-Project fate of runoff from the Project site.

3. A discussion of potential indirect Project impacts on biological resources, including resources in areas adjacent to the Project footprint, such as nearby public lands (e.g. National Forests, State Parks, etc.), open space, adjacent natural habitats, riparian ecosystems, wildlife corridors, and any designated and/or proposed reserve or mitigation lands (e.g., preserved lands associated with a Conservation or Recovery Plan, or other conserved lands).

4. A cumulative effects analysis developed as described under CEQA Guidelines section 15130. The EIR should discuss the Project's cumulative impacts to natural resources and determine if that contribution would result in a significant impact. The EIR should include a list of present, past, and probable future projects producing related impacts to biological resources or shall include a summary of the projections contained in an adopted local, regional, or statewide plan, that consider conditions contributing to a cumulative effect. The cumulative analysis shall include impact analysis of vegetation and habitat reductions within the area and their potential cumulative effects. Please include all potential direct and indirect Project-related impacts to riparian areas, wetlands, wildlife corridors or wildlife movement areas, aquatic habitats, sensitive species and/or special-status species, open space, and adjacent natural habitats in the cumulative effects analysis.

Mitigation Measures for Project Impacts to Biological Resources

The EIR should include appropriate and adequate avoidance, minimization, and/or mitigation measures for all direct, indirect, and cumulative impacts that are expected to occur as a result of the construction and long-term operation and maintenance of the Project. CDFW also recommends the environmental documentation provide scientifically supported discussion regarding adequate avoidance, minimization, and/or mitigation measures to address the Project's significant impacts upon fish and wildlife and their habitat. For individual projects, mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (Guidelines § § 15126.4(a)(4)(B), 15064, 15065, and 16355). In order for mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental conditions. When proposing measures to avoid, minimize, or mitigate impacts, CDFW recommends consideration of the following:

1. *Mitigation*: CDFW considers adverse Project-related impacts to sensitive species and habitats to be significant to both local and regional ecosystems, and the EIR should include mitigation measures for adverse Project-related impacts to these resources. Mitigation measures should emphasize avoidance and reduction of Project impacts. For unavoidable impacts, onsite habitat restoration, enhancement, or permanent protection should be evaluated and discussed in detail. If onsite mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, offsite mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.

   The EIR should include measures to perpetually protect the targeted habitat values within mitigation areas from direct and indirect adverse impacts in order to meet mitigation objectives to offset Project-induced qualitative and quantitative losses of biological values. Specific issues that should be addressed include restrictions on access, proposed land dedications, long-term monitoring and management programs, control of illegal dumping, water pollution, increased human intrusion, etc.

2. *Nesting Birds:* Please note that it is the Project proponent's responsibility to comply with all applicable laws related to nesting birds and birds of prey. Migratory non-game native bird species are protected by international treaty under the federal Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et seq.*). CDFW implemented the MBTA by adopting the Fish and Game Code section 3513. Fish and Game Code sections 3503, 3503.5 and 3800 provide additional protection to nongame birds, birds of prey, their nests and eggs. Sections 3503, 3503.5, and 3513 of the Fish and Game Code afford protective measures as follows: section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the Fish and Game Code or any regulation made pursuant thereto; section 3503.5 states that is it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-

prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by the Fish and Game Code or any regulation adopted pursuant thereto; and section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Potential habitat for nesting birds and birds of prey is present within the Project area. The Project should disclose all potential activities that may incur a direct or indirect take to nongame nesting birds within the Project footprint and its vicinity. Appropriate avoidance, minimization, and/or mitigation measures to avoid take must be included in the EIR.

CDFW recommends the EIR include specific avoidance and minimization measures to ensure that impacts to nesting birds or their nests do not occur. Project-specific avoidance and minimization measures may include, but not be limited to: Project phasing and timing, monitoring of Project-related noise (where applicable), sound walls, and buffers, where appropriate. The EIR should also include specific avoidance and minimization measures that will be implemented should a nest be located within the Project site. In addition to larger, protocol level survey efforts (e.g. Swainson's hawk surveys) and scientific assessments, CDFW recommends a final preconstruction survey be required no more than three (3) days prior to vegetation clearing or ground disturbance activities, as instances of nesting could be missed if surveys are conducted earlier.

The EIR should incorporate mitigation performance standards that would ensure that impacts are reduced to a less-than-significant level. Mitigation measures proposed in the EIR should be made a condition of approval of the Project. Please note that obtaining a permit from CDFW by itself with no other mitigation proposal may constitute mitigation deferral. CEQA Guidelines section 15126.4, subdivision (a)(1)(B) states that formulation of mitigation measures should not be deferred until some future time. To avoid deferring mitigation in this way, the EIR should describe avoidance, minimization and mitigation measures that would be implemented should the impact occur.

Groundwater Management

Development and implementation of Groundwater Sustainability Plans (GSPs) under the Sustainable Groundwater Management Act represents a new era of California groundwater management. CDFW has an interest in the sustainable management of groundwater, as many sensitive ecosystems, species, and public trust resources depend on groundwater and interconnected surface waters (ISWs).
SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to GSPs:

1. GSPs must **consider impacts to groundwater dependent ecosystems** (GDEs) (Water Code § 10727.4(l); see also 23 CCR § 354.16(g));

2. GSPs must consider the interests of all beneficial uses and users of groundwater, including environmental users of groundwater (Water Code § 10723.2) and GSPs must **identify and consider potential effects on all beneficial uses and users of groundwater** (23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3));

3. GSPs must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of ISW that have significant and unreasonable adverse impacts on beneficial uses of the surface water** (23 CCR § 354.22 *et seq*. and Water Code §§ 10721(x)(6) and 10727.2(b)) and describe monitoring networks that can identify adverse impacts to beneficial uses of ISWs (23 CCR § 354.34(c)(6)(D)); and,

4. GSPs must **account for groundwater extraction for all water use sectors,** including managed wetlands, managed recharge, and native vegetation (23 CCR §§ 351(al) and 354.18(b)(3)).

In the context of SGMA statutes and regulations, and Public Trust Doctrine considerations, groundwater planning should carefully consider and protect environmental beneficial uses and users of groundwater, including fish and wildlife and their habitats, GDEs, and ISWs.

Furthermore, the Public Trust Doctrine imposes a related but distinct obligation to consider how groundwater management affects public trust resources, including navigable surface waters and fisheries. Groundwater hydrologically connected to surface waters is also subject to the Public Trust Doctrine to the extent that groundwater extractions or diversions affect or may affect public trust uses. (*Environmental Law Foundation v. State Water Resources Control Board* (2018), 26 Cal. App. 5th 844; *National Audubon Society v. Superior Court* (1983), 33 Cal. 3d 419). The City of Sacramento has “an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible.” (*National Audubon Society*, *supra*, 33 Cal. 3d at 446). Accordingly, the EIR should consider potential impacts to and appropriate protections for ISWs and their tributaries, and ISWs that support fisheries, including the level of groundwater contribution to those waters.

Provided the above SGMA and Public Trust Doctrine considerations, CDFW requests the consideration and/or analysis of each of the following in the EIR:

1. **Consistency with North and South American Subbasin GSP Sustainable Management Criteria**

   The IS currently notes the City of Sacramento’s intent to coordinate with both subbasins to be consistent with their respective GSP sustainability goals (IS 3-49). The IS then states both that the planned extraction under the GWMP may

exceed sustainable yield in the South American Subbasin (IS 3-50), and that no groundwater goals or thresholds have been established to date (IS 3-51). Both the North and South American Subbasins have adopted final GSPs which establish groundwater goals and thresholds. Accordingly, the EIR should analyze impacts of GWMP implementation under the lens of established groundwater basin thresholds for each subbasin.

2. **Impacts on Groundwater Dependent Ecosystems and Interconnected Surface Waters**

   Consistent with SGMA and its implementing regulations, the EIR should analyze the potential impacts of a range of projected extraction scenarios (e.g., different pumping volume and timing by water year type) on proximate GDEs and ISW. Where the IS defaults to a 100-foot buffer for many Project impacts analyses, the potential hydrologic influence of a well is specific to each well and subsurface hydrology but may extend well past 100 feet when connectivity exists between the production aquifer and shallower aquifers supporting GDEs or ISW.
   A complete overhaul of the City's groundwater infrastructure has the potential to dramatically increase hydraulic interaction between subsurface aquifers, and between aquifers and surface waters. The EIR should model projected Project effects on aquifer dynamics and surface waters under a range of extraction scenarios and should specifically include an analysis of streamflow depletion and impacts to shallow groundwaters that support potential GDEs. The EIR should also identify mitigation measures that include identification and/or installation of monitoring wells to substantiate modeled projections for aquifer interactions during and after Project implementation so as to identify when wells, individually or collectively, may be depleting shallow groundwater resources.

3. **Baseline extraction capacity and volumes versus project extraction capacity and volumes**

   CDFW recommends a tabular comparison of current groundwater extraction capacity (e.g., gallons per minute) and volume (e.g., total volume extracted by water year type), versus anticipated groundwater extraction capacity and volume under the replaced groundwater well regime. This will better enable stakeholders to understand the change in extraction potential between baseline and the updated well infrastructure.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database, which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e)). Accordingly, please report any special-status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link:

https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data. The completed form can be submitted online or mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov.

FILING FEES

The Project, as proposed, would have an effect on fish and wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

Pursuant to Public Resources Code sections 21092 and 21092.2, CDFW requests written notification of proposed actions and pending decisions regarding the Project. Written notifications shall be directed to: California Department of Fish and Wildlife North Central Region, 1701 Nimbus Road, Rancho Cordova, CA 95670.

CDFW appreciates the opportunity to comment on the NOP of the EIR for the Groundwater Master Plan Well Replacement Program and recommends that the City of Sacramento address CDFW's comments and concerns in the forthcoming EIR. CDFW personnel are available for consultation regarding biological resources and strategies to minimize impacts.

If you have any questions regarding the comments provided in this letter or wish to schedule a meeting and/or site visit, please contact Dylan Wood, Environmental Scientist, at (916) 358-2384 or by email at dylan.wood@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Jennifer Garcia
B35A7660DD7848B...

Kelley Barker
Environmental Program Manager

ec: Juan Torres, Senior Environmental Scientist (Supervisory)
Dylan Wood, Environmental Scientist
CEQACommentLetters@wildlife.ca.gov
Department of Fish and Wildlife

Office of Planning and Research, State Clearinghouse, Sacramento

Literature Cited

Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens. 2009. A Manual of California Vegetation, 2nd ed. California Native Plant Society Press, Sacramento, California. http://vegetation.cnps.org/

APPENDIX B - PROPOSED WELL SITE LOCATIONS

Well 1
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 12.5 25 50
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 2
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

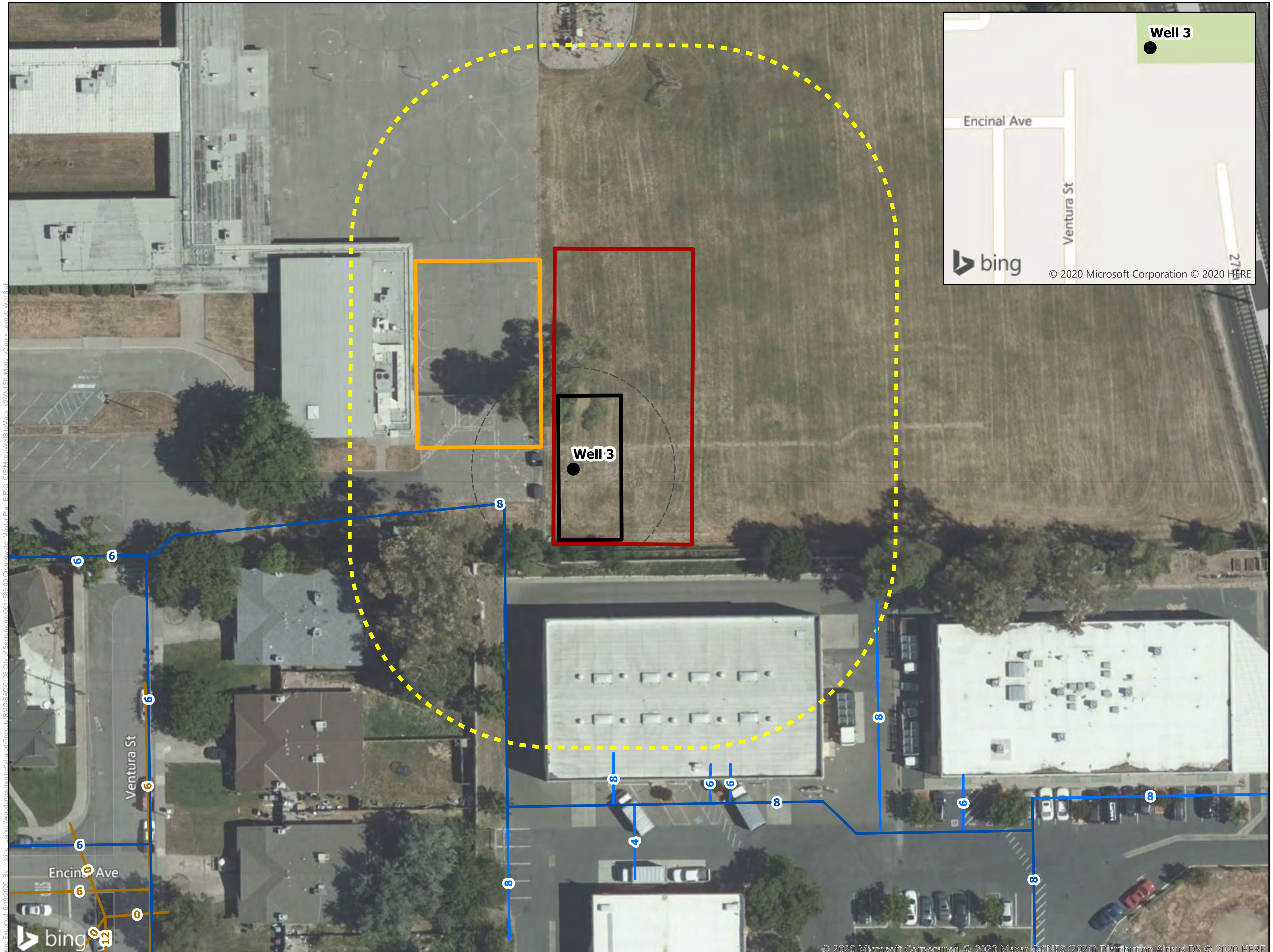
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 3
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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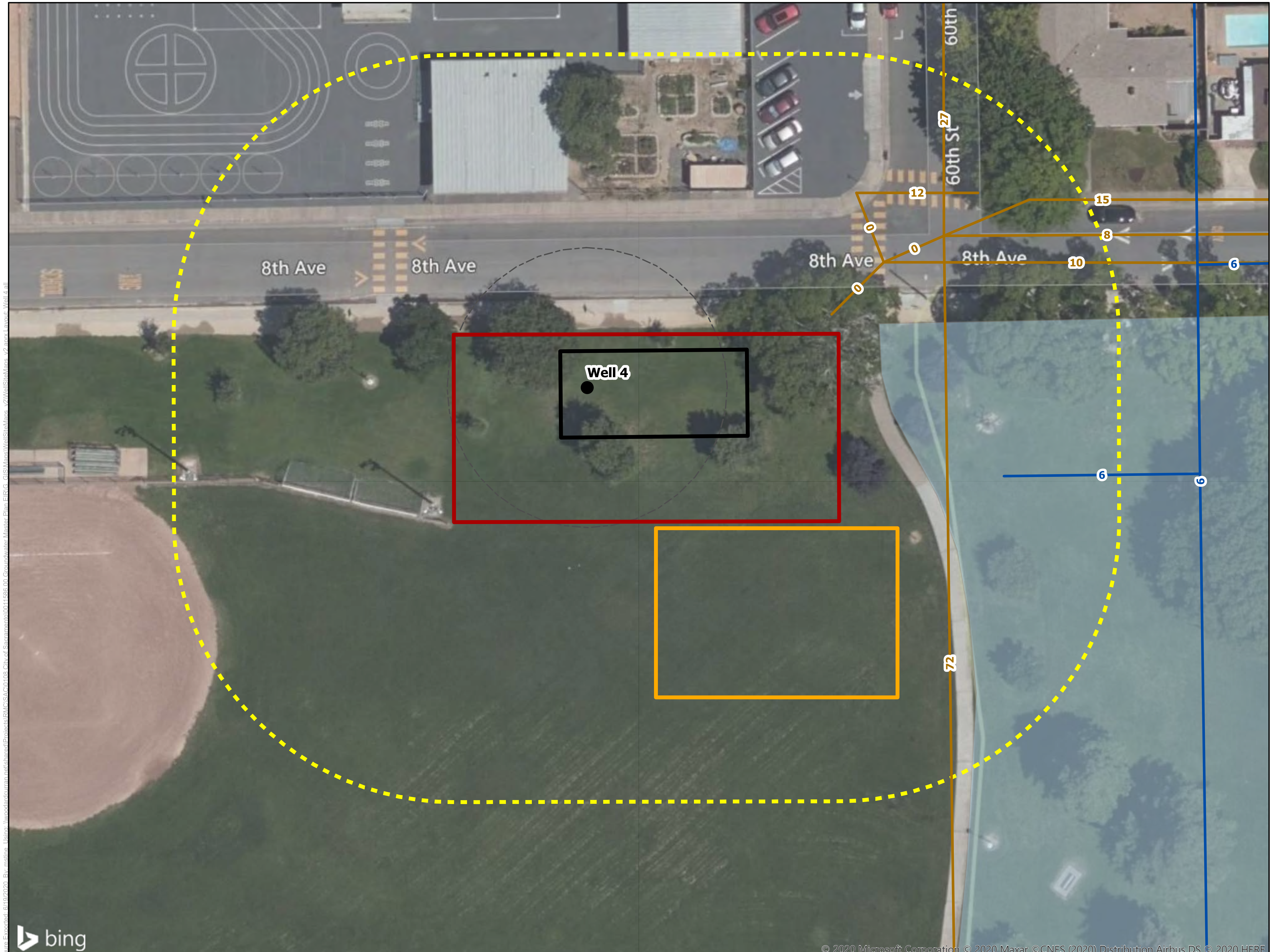

Well 4 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Sewer Main
- Detention Basin

0 10 20 40
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

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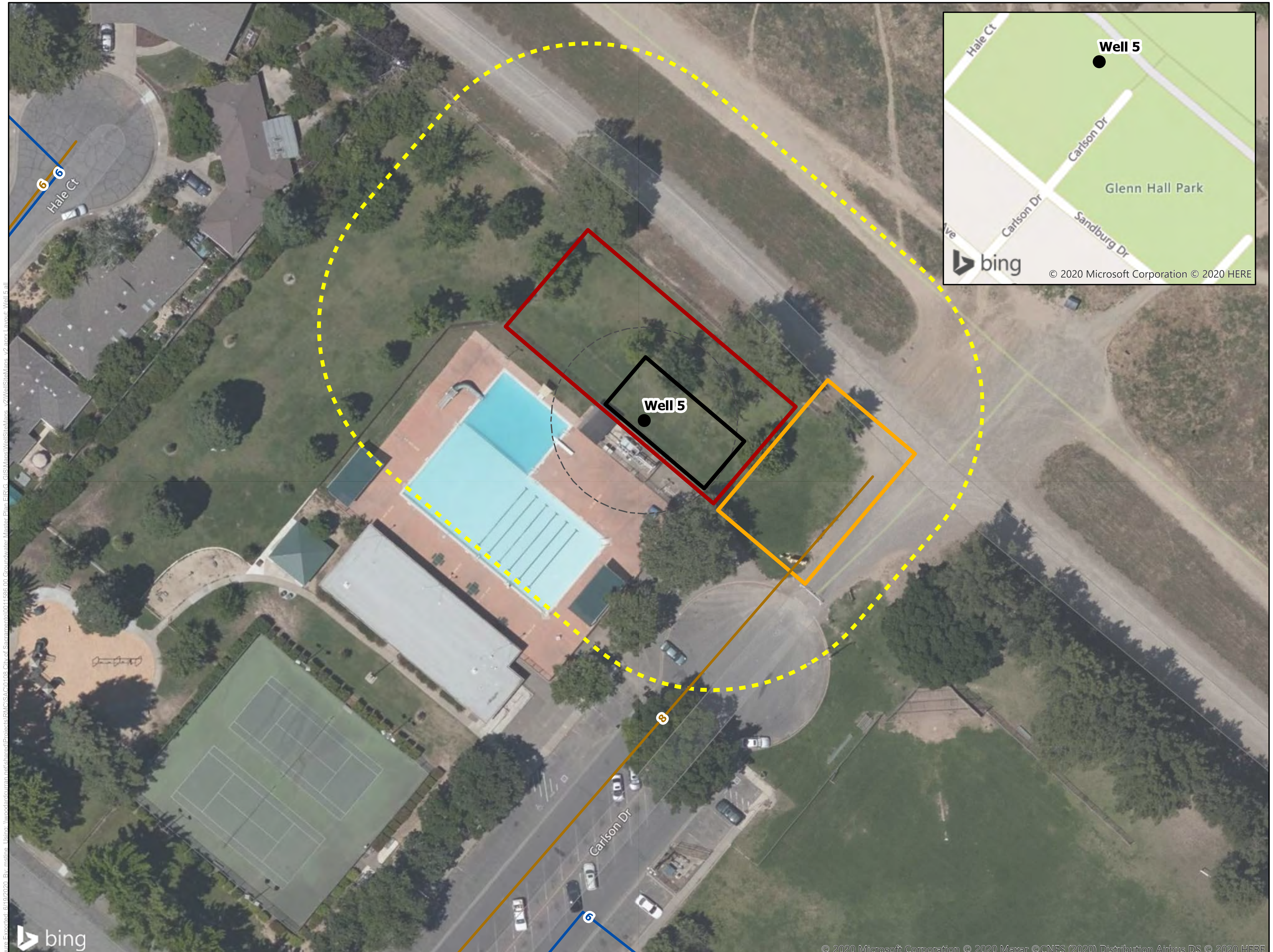

Well 5 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 6 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

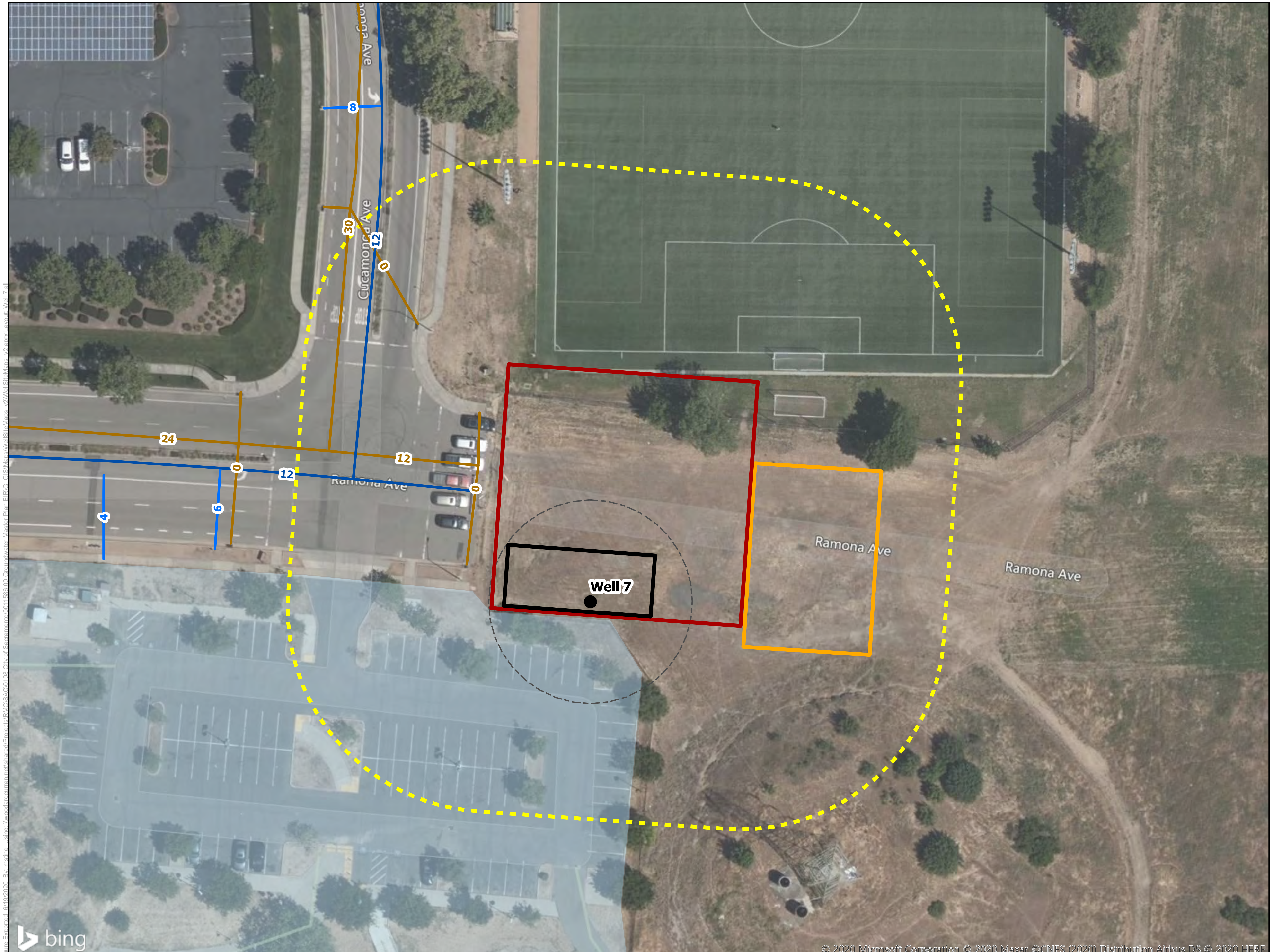
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 12.5 25 50 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 7 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 8
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 9 & 36
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- City of Sacramento Boundary

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 10
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

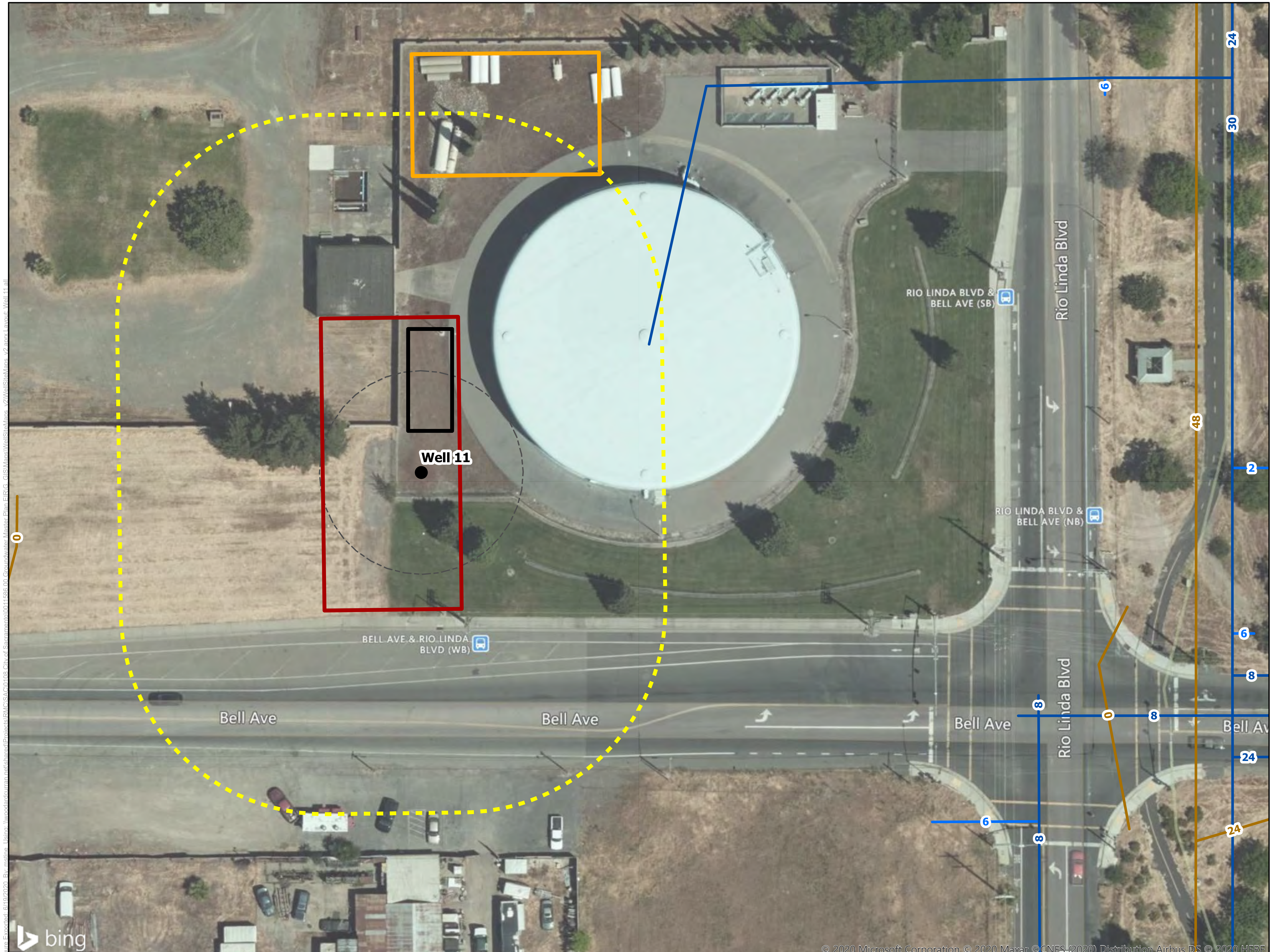
Project #: 0011586.00
Map Created: June 2020

Well 10
South Ave
South Ave
South Ave
High St
High St
STOP
STOP
bing

Well 11
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 12 & 37
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- City of Sacramento Boundary

0 20 40 80
US Feet

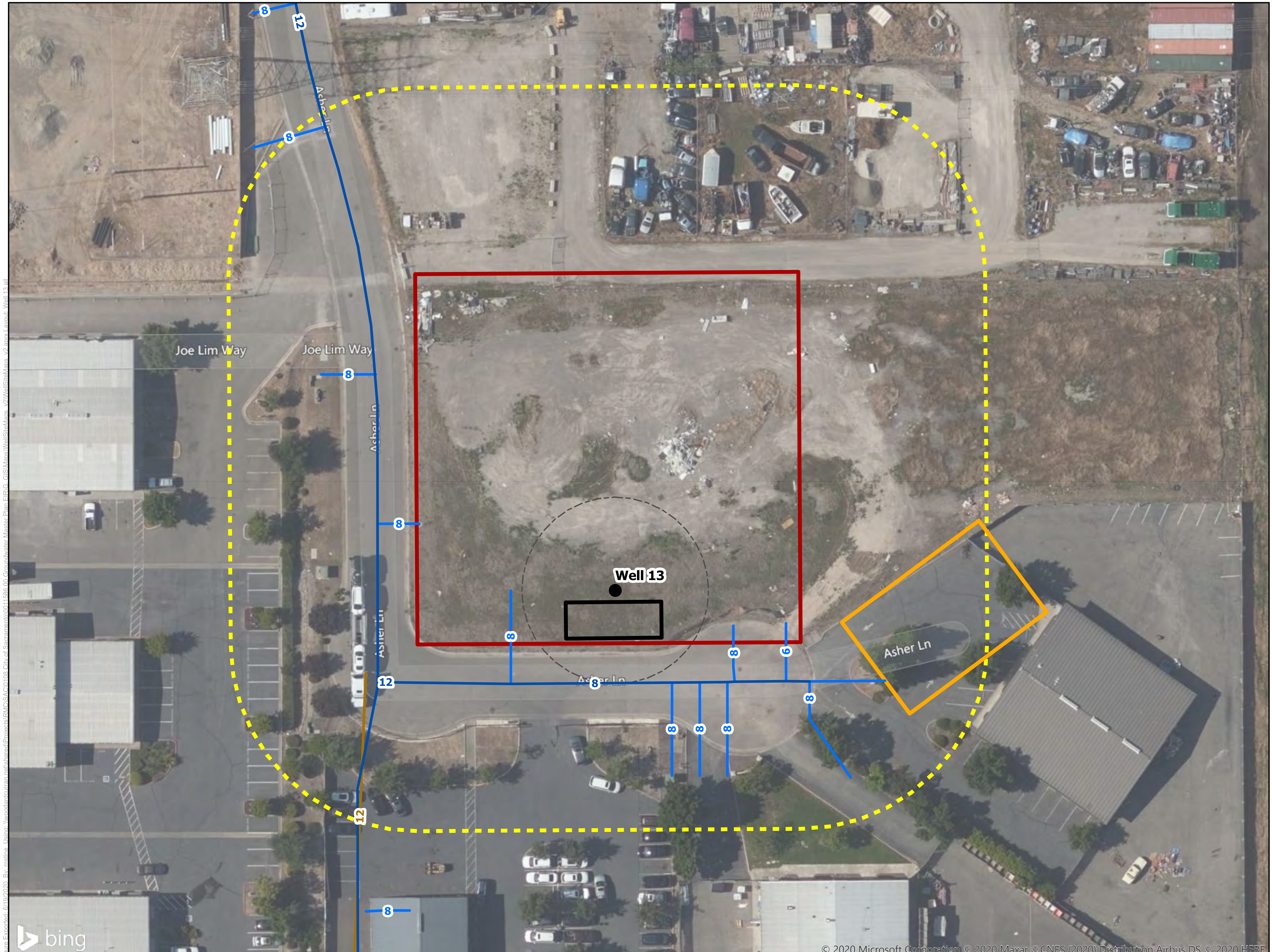
WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 13
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 14 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Existing Water Well
- Water Main
- Sewer Main
- Sewer Lateral Line

0 20 40 80 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

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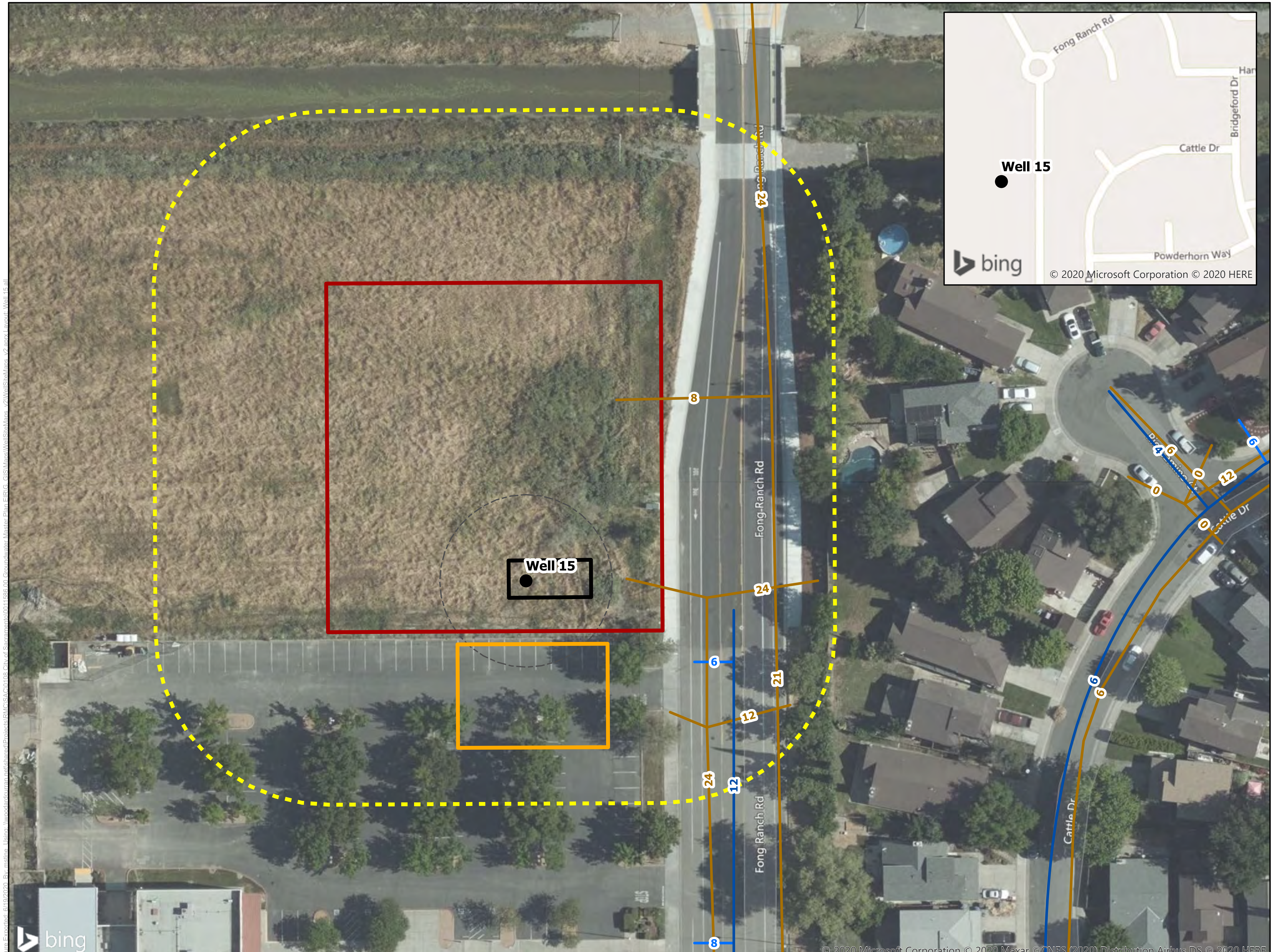


Well 15 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

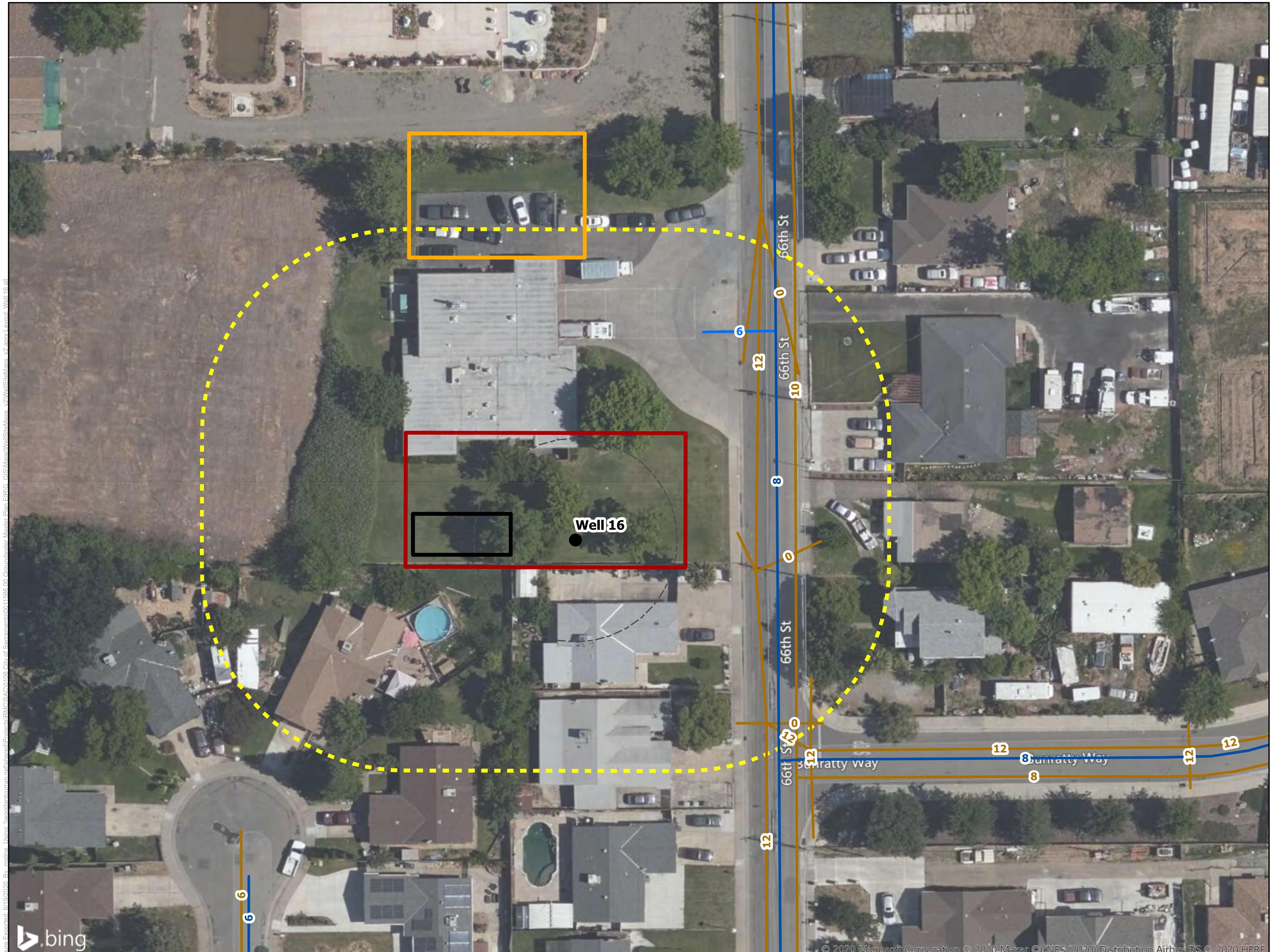
- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**



Well 16 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

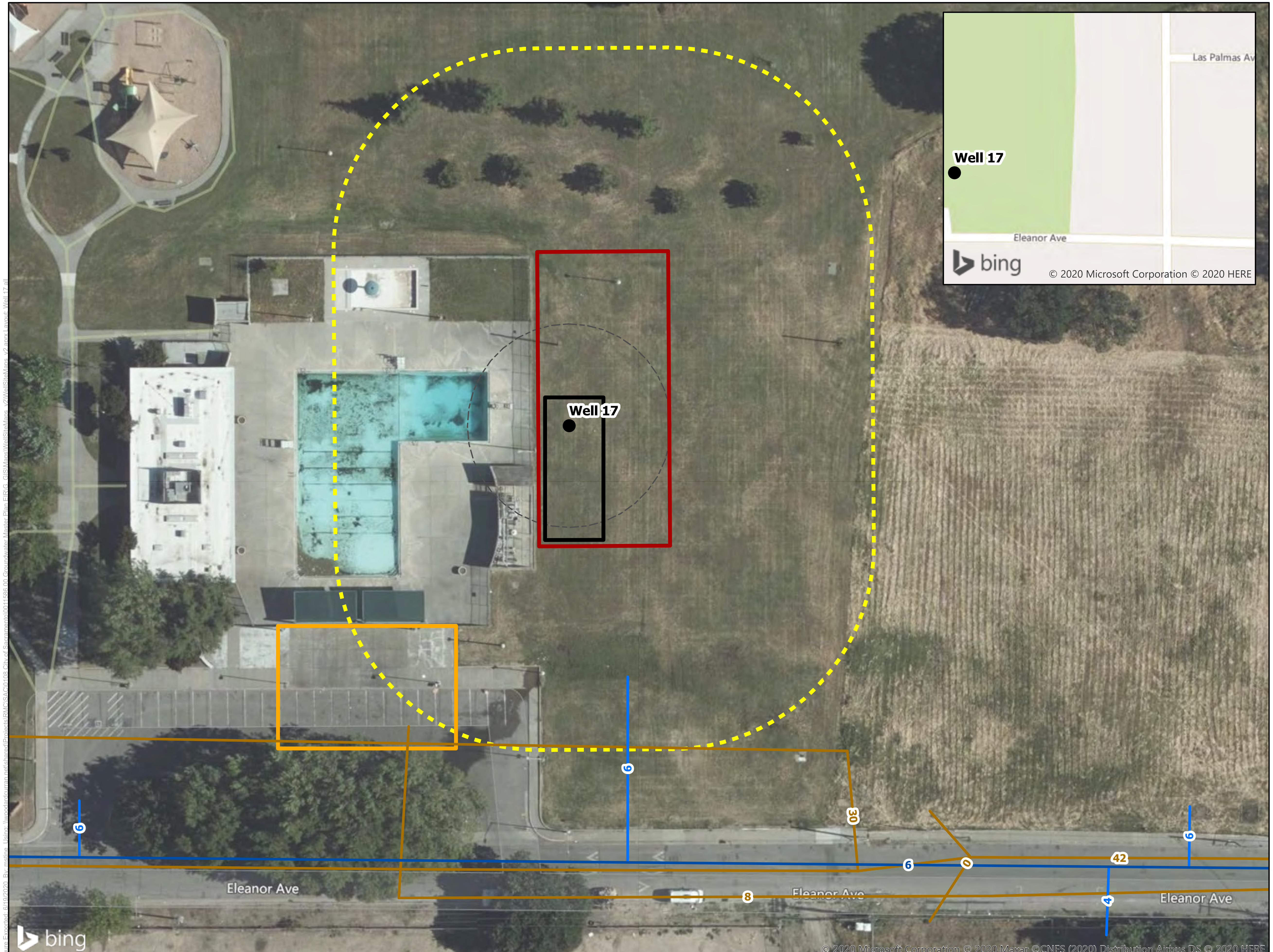
Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 17
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 19
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

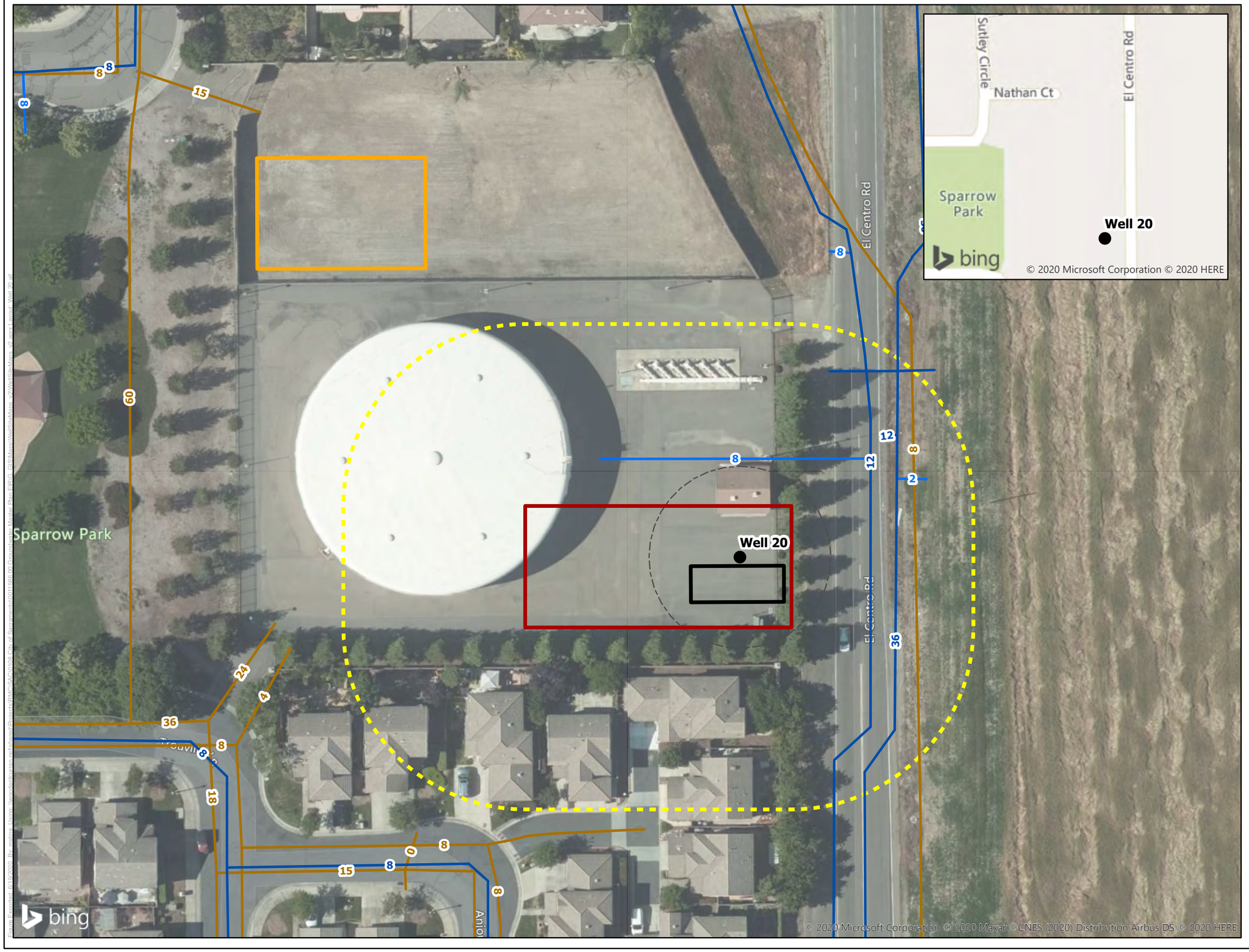
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin
- City of Sacramento Boundary

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 20
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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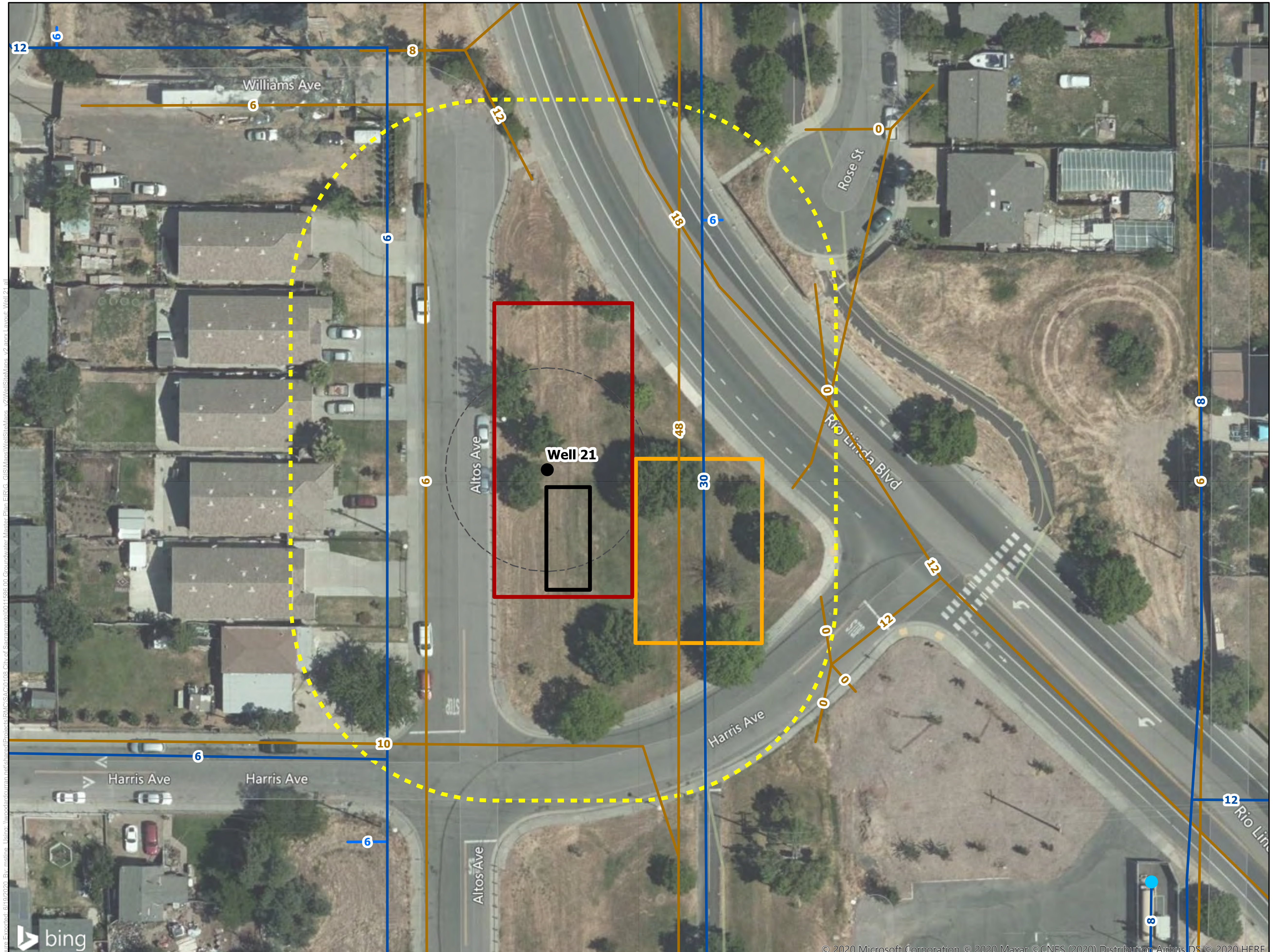

Well 21 Conceptual Site Layout

City of Sacramento

Well Replacement Program CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 22
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 23 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

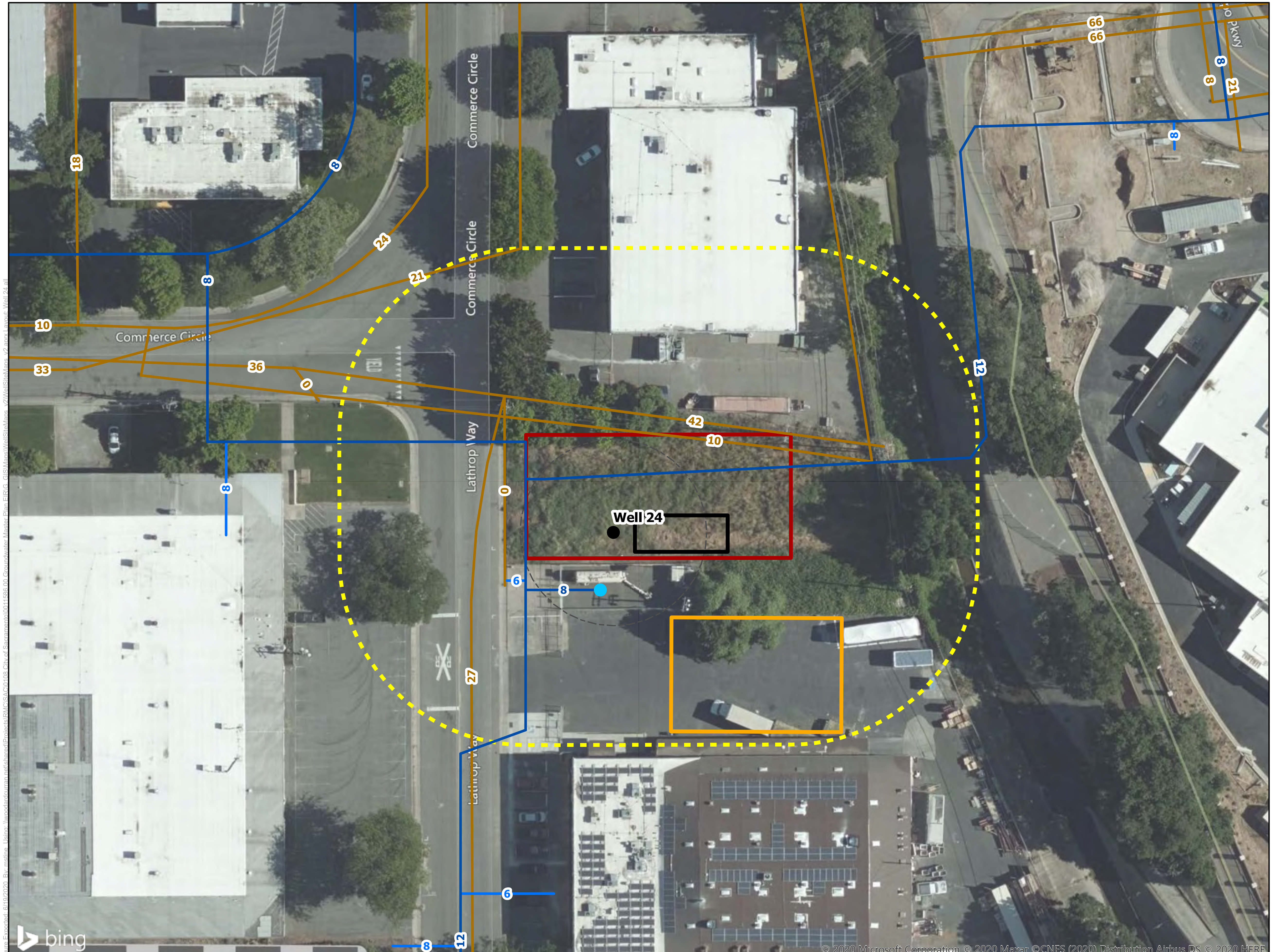
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 25 50 100
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 24
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 25 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

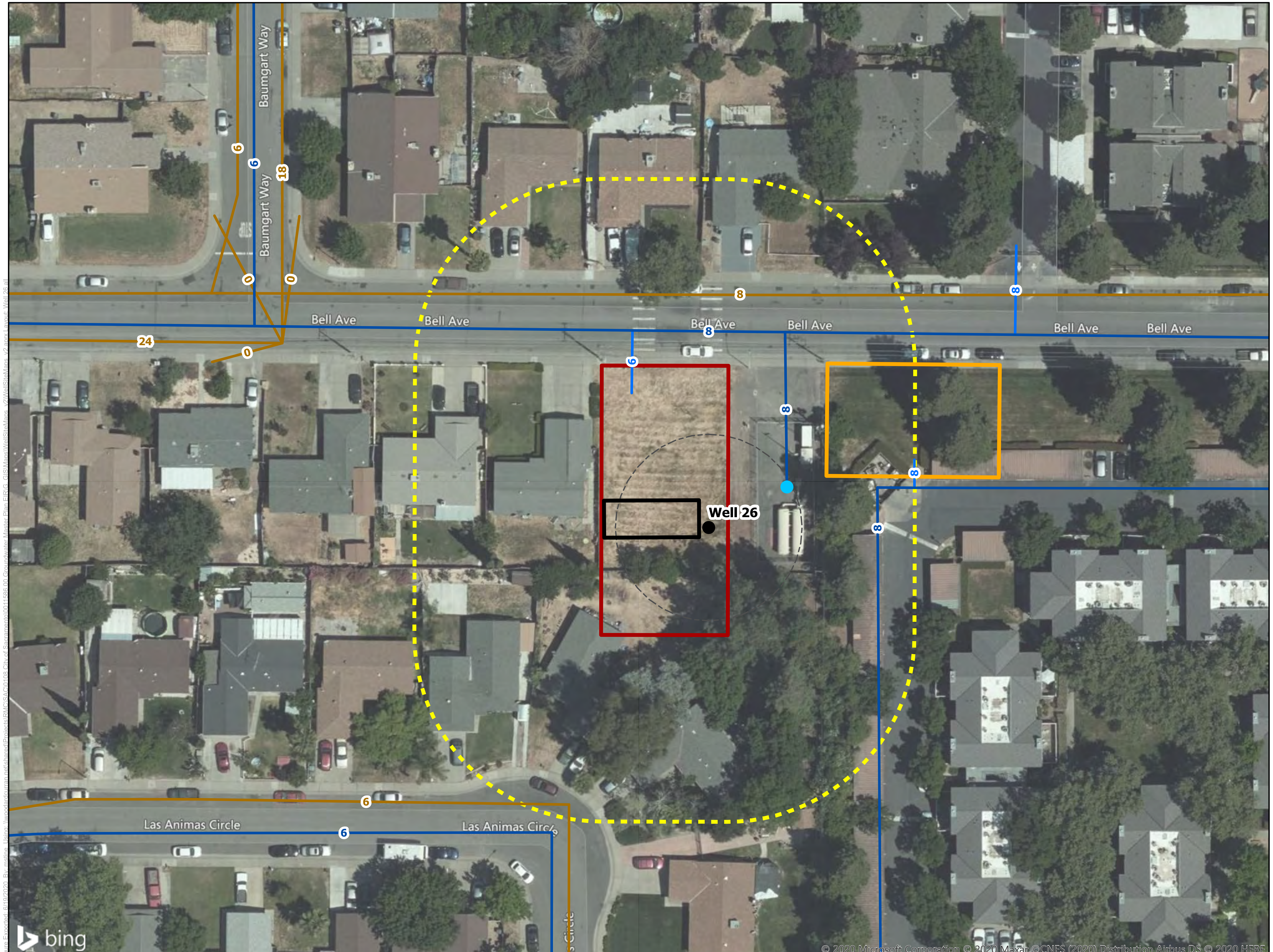
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 26 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 27 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

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Well 28
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

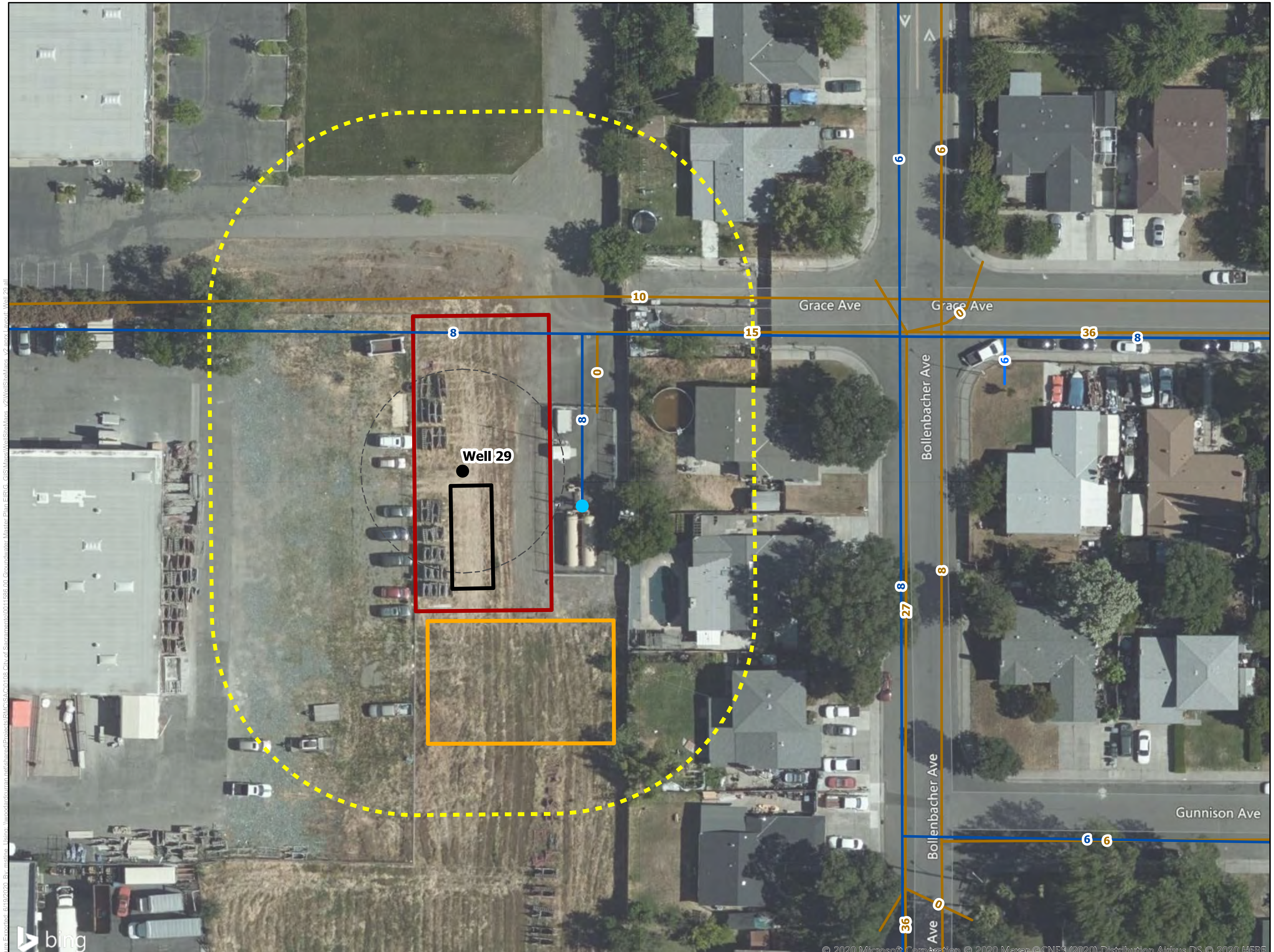
Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main
- City of Sacramento Boundary

0 20 40 80
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020



Well 29 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

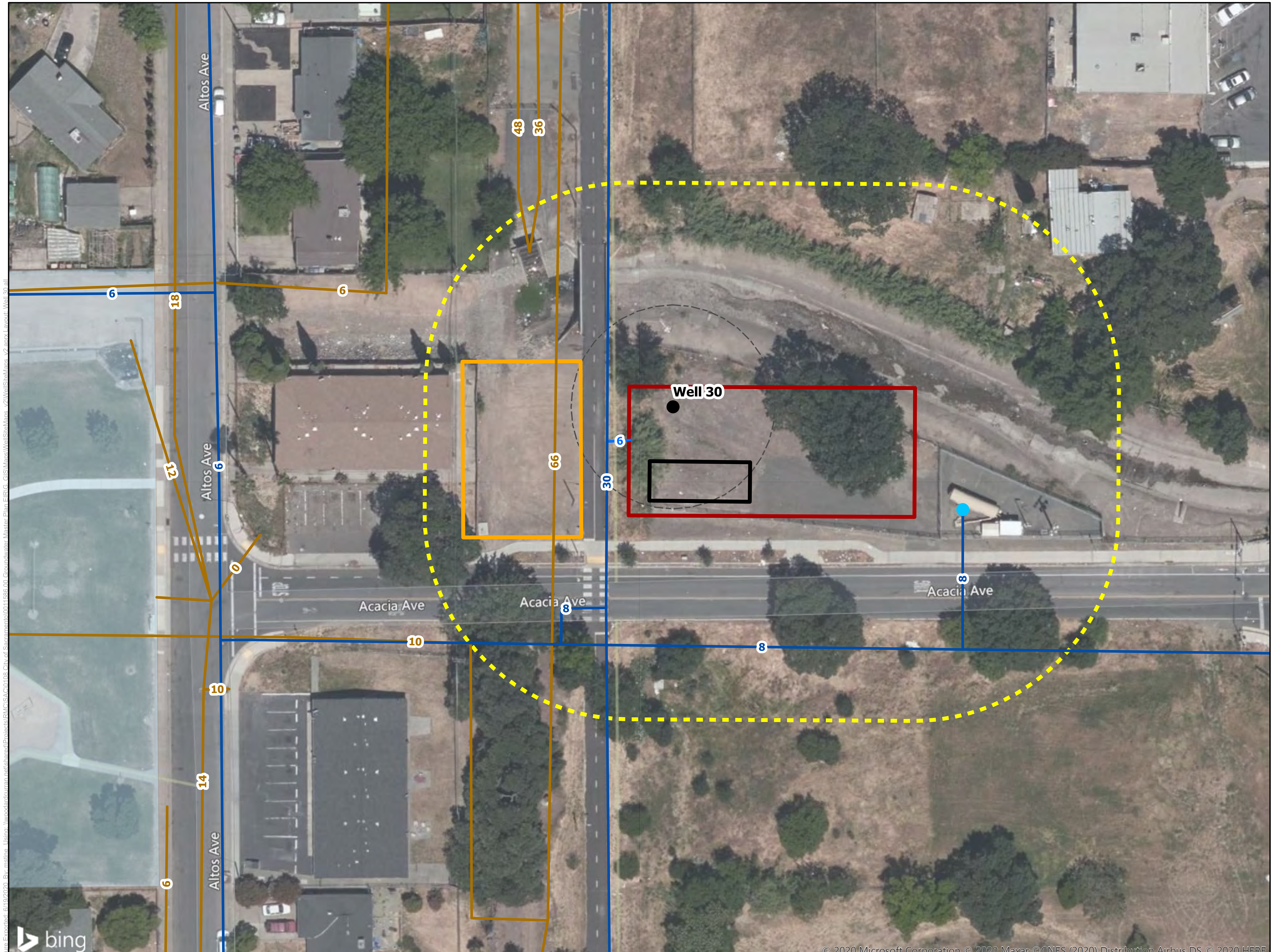
Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 30 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin

0 15 30 60 US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 31
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 32
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 33
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

N

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Well 34
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD &CURRAN

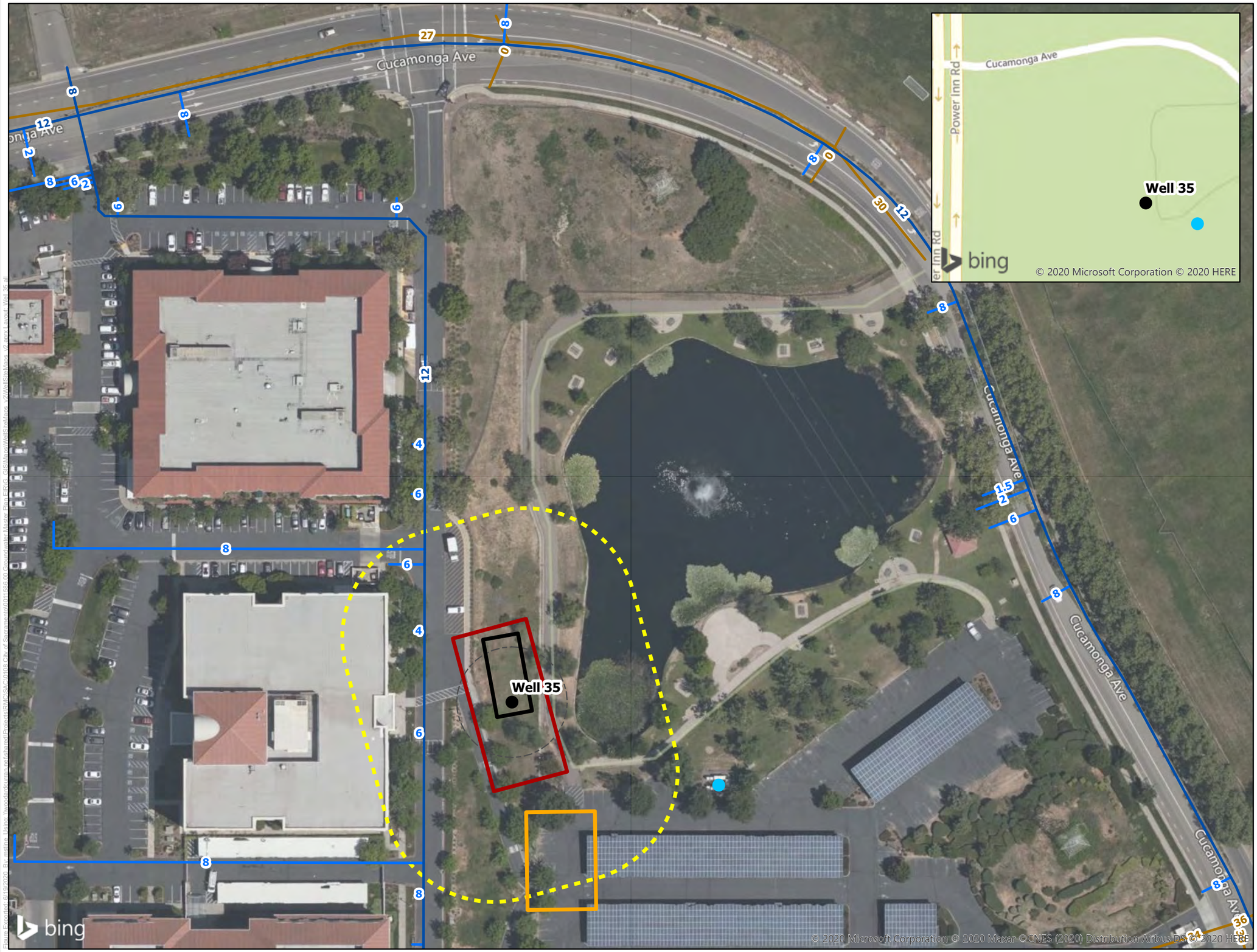
Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 35
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Existing Water Well
- Water Main
- Water Lateral Line
- Sewer Main

N

0 25 50 100
US Feet

WOODARD &CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 38 Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study

N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- 100-foot Well Buffer
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main

0 15 30 60
US Feet

WOODARD & CURRAN

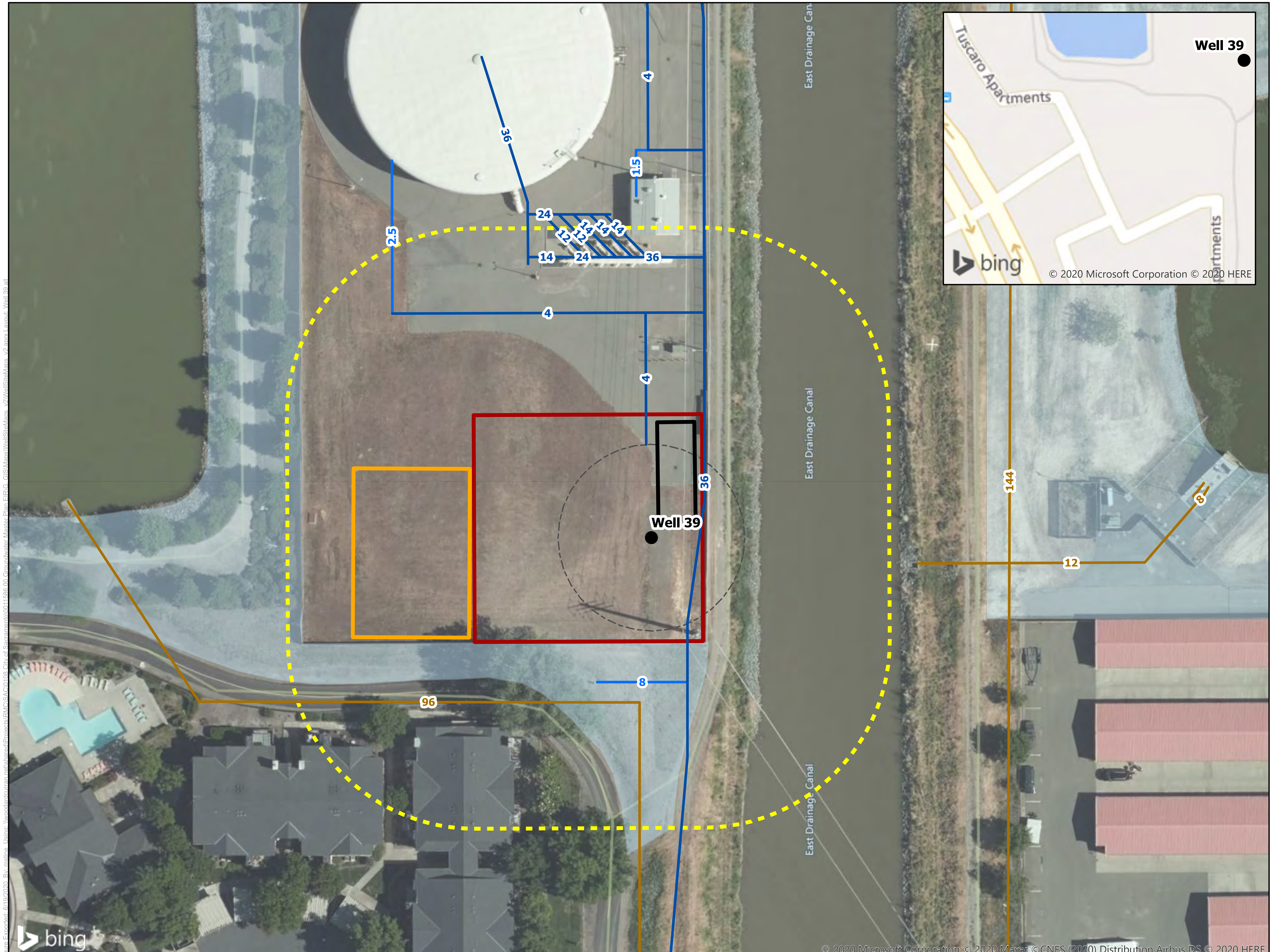
Project #: 0011586.00
Map Created: June 2022

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

Well 39
Conceptual Site Layout

City of Sacramento

Well Replacement Program
CEQA Initial Study



N

Legend

- Replacement Well
- 50-foot DDW Well Site Control Zone
- Well Site Activity Area
- Control Building
- Potential Construction Staging Area
- 100-foot Construction Impact Area Buffer
- Water Main
- Water Lateral Line
- Sewer Main
- Detention Basin

0 15 30 60
US Feet

WOODARD & CURRAN

Project #: 0011586.00
Map Created: June 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: City of Sacramento and ESRI**

APPENDIX C - CalEEMod OUTPUTS

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Sac GW Master Plan - Single Well - Dry Year
Lead Agency	City of Sacramento
Land Use Sca	Project/site
Analysis Leve	County
Windspeed (I	3.5
Precipitation	36.4
Location	38.59694156972523, -121.45572359088179
County	Sacramento
City	Sacramento
Air District	Sacramento Metropolitan AQMD
Air Basin	Sacramento Valley
TAZ	521
EDFZ	13
Electric Utilit	Sacramento Municipal Utility District
Gas Utility	Pacific Gas & Electric

1.2. Land Use Types

Land Use Sut	Size	Unit	Lot Acreage	Building A	Landscape	Special Lar	Populatior	Description
General Light	44	1000sqft	1.01	44000	0	0		
Other Asphal	69	1000sqft	1.58	0	0	0		

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-B	Water Active Demolition Sites
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Un/Mit.	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Unmit.	2.57	2.13	18.7	21.4	0.04	0.84	0.24	1.08	0.77	0.06	0.83		4354	4354	0.18	0.07	1.53	4382
Mit.	2.57	2.13	18.7	21.4	0.04	0.84	0.24	1.08	0.77	0.06	0.83		4354	4354	0.18	0.07	1.53	4382
% Reduced																		
Daily, Winter (Max)																		
Unmit.	5.9	19.3	40.3	45	0.11	1.63	7.18	8.02	1.5	3.45	4.22		11726	11726	0.49	0.52	0.18	11794
Mit.	5.9	19.3	40.3	45	0.11	1.63	2.86	3.7	1.5	1.36	2.13		11726	11726	0.49	0.52	0.18	11794
% Reduced							60.1	53.9		60.6	49.6							
Average Daily (Max)																		

Unmit.	1.88	2.46	13.7	15	0.03	0.58	0.39	0.97	0.53	0.12	0.65		3493	3493	0.16	0.08	0.61	3521
Mit.	1.88	2.46	13.7	15	0.03	0.58	0.28	0.86	0.53	0.08	0.61		3493	3493	0.16	0.08	0.61	3521
% Reduced							28.3	11.4		33.6	5.97							
Annual (Max)																		
Unmit.	0.34	0.45	2.51	2.74	0.01	0.11	0.07	0.18	0.1	0.02	0.12		578	578	0.03	0.01	0.1	583
Mit.	0.34	0.45	2.51	2.74	0.01	0.11	0.05	0.16	0.1	0.01	0.11		578	578	0.03	0.01	0.1	583
% Reduced							28.3	11.4		33.6	5.97							
Exceeds (Daily Max)																		
Threshold			85					80			82							
Unmit.		No					No			No							Yes	
Mit.		No					No			No							Yes	
Exceeds (Average Daily)																		
Threshold			85					80			82							
Unmit.		No					No			No							Yes	
Mit.		No					No			No							Yes	
Exceeds (Annual)																		
Threshold																		1100
Unmit.																	No	
Mit.																	No	

2.2. Construction Emissions by Year, Unmitigated

Year	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																		
2023	2.57	2.13	18.7	21.4	0.04	0.84	0.24	1.08	0.77	0.06	0.83		4354	4354	0.18	0.07	1.53	4382
Daily - Winter (Max)																		
2023	5.9	19.3	40.3	45	0.11	1.63	7.18	8.02	1.5	3.45	4.22		11726	11726	0.49	0.52	0.18	11794
Average Daily																		
2023	1.88	2.46	13.7	15	0.03	0.58	0.39	0.97	0.53	0.12	0.65		3493	3493	0.16	0.08	0.61	3521
Annual																		
2023	0.34	0.45	2.51	2.74	0.01	0.11	0.07	0.18	0.1	0.02	0.12		578	578	0.03	0.01	0.1	583

2.3. Construction Emissions by Year, Mitigated

Year	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																		
2023	2.57	2.13	18.7	21.4	0.04	0.84	0.24	1.08	0.77	0.06	0.83		4354	4354	0.18	0.07	1.53	4382
Daily - Winter (Max)																		
2023	5.9	19.3	40.3	45	0.11	1.63	2.86	3.7	1.5	1.36	2.13		11726	11726	0.49	0.52	0.18	11794
Average Daily																		
2023	1.88	2.46	13.7	15	0.03	0.58	0.28	0.86	0.53	0.08	0.61		3493	3493	0.16	0.08	0.61	3521
Annual																		
2023	0.34	0.45	2.51	2.74	0.01	0.11	0.05	0.16	0.1	0.01	0.11		578	578	0.03	0.01	0.1	583

2.4. Operations Emissions Compared Against Thresholds

Un/Mit.	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Unmit.	2	2.86	4.24	7.44	0.01	0.22	< 0.005	0.23	0.23	< 0.005	0.23	0	1374	1374	0.06	0.01	0.04	1378

Daily, Winter (Max)																		
Unmit.	1.66	2.55	4.23	5.52	0.01	0.22	< 0.005	0.23	0.22	< 0.005	0.22	0	1365	1365	0.06	0.01	< 0.005	1369
Average Daily (Max)																		
Unmit.	0.26	1.27	0.07	1.41	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	0.01	0	606	606	0.03	< 0.005	0.01	608
Annual (Max)																		
Unmit.	0.05	0.23	0.01	0.26	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	100	100	< 0.005	< 0.005	< 0.005	101
Exceeds (Daily Max)																		
Threshold		65	65					80			82							
Unmit.	No	No						No			No						Yes	
Exceeds (Average Daily)																		
Threshold		65	65					80			82							
Unmit.	No	No						No			No						Yes	
Exceeds (Annual)																		
Threshold																		1100
Unmit.																		No

2.5. Operations Emissions by Sector, Unmitigated

Sector	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Mobile	0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Area	0.34	1.35	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Energy	0	0	0	0	0	0		0	0		0		583	583	0.02	< 0.005		584
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	2	2.86	4.24	7.44	0.01	0.22	< 0.005	0.23	0.23	< 0.005	0.23	0	1374	1374	0.06	0.01	0.04	1378
Daily, Winter (Max)																		
Mobile	0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.65	9.65	< 0.005	< 0.005	< 0.005	9.81
Area		1.04																
Energy	0	0	0	0	0	0		0	0		0		583	583	0.02	< 0.005		584
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	1.66	2.55	4.23	5.52	0.01	0.22	< 0.005	0.23	0.22	< 0.005	0.22	0	1365	1365	0.06	0.01	< 0.005	1369
Average Daily																		
Mobile	< 0.005	< 0.005	< 0.005	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		7.03	7.03	< 0.005	< 0.005	0.01	7.15
Area	0.23	1.25	0.01	1.31	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		5.39	5.39	< 0.005	< 0.005		5.41
Energy	0	0	0	0	0	0		0	0		0		583	583	0.02	< 0.005		584
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	0.02	0.02	0.06	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		10.6	10.6	< 0.005	< 0.005		10.6
Total	0.26	1.27	0.07	1.41	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	0.01	0	606	606	0.03	< 0.005	0.01	608
Annual																		
Mobile	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.16	1.16	< 0.005	< 0.005	< 0.005	1.18
Area	0.04	0.23	< 0.005	0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9
Energy	0	0	0	0	0	0		0	0		0		96.5	96.5	< 0.005	< 0.005		96.8

Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	< 0.005	< 0.005		0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	0.05	0.23	0.01	0.26	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	100	100	< 0.005	< 0.005	< 0.005	101

2.6. Operations Emissions by Sector, Mitigated

Sector	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Mobile	0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Area	0.34	1.35	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Energy	0	0	0	0	0	0		0	0		0		583	583	0.02	< 0.005		584
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	2	2.86	4.24	7.44	0.01	0.22	< 0.005	0.23	0.23	< 0.005	0.23	0	1374	1374	0.06	0.01	0.04	1378
Daily, Winter (Max)																		
Mobile	0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.65	9.65	< 0.005	< 0.005	< 0.005	9.81
Area		1.04																
Energy	0	0	0	0	0	0		0	0		0		583	583	0.02	< 0.005		584
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	1.66	2.55	4.23	5.52	0.01	0.22	< 0.005	0.23	0.22	< 0.005	0.22	0	1365	1365	0.06	0.01	< 0.005	1369
Average Daily																		
Mobile	< 0.005	< 0.005	< 0.005	0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		7.03	7.03	< 0.005	< 0.005	0.01	7.15
Area	0.23	1.25	0.01	1.31	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		5.39	5.39	< 0.005	< 0.005		5.41
Energy	0	0	0	0	0	0		0	0		0		583	583	0.02	< 0.005		584
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	0.02	0.02	0.06	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		10.6	10.6	< 0.005	< 0.005		10.6
Total	0.26	1.27	0.07	1.41	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	0.01	0	606	606	0.03	< 0.005	0.01	608
Annual																		
Mobile	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.16	1.16	< 0.005	< 0.005	< 0.005	1.18
Area	0.04	0.23	< 0.005	0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9
Energy	0	0	0	0	0	0		0	0		0		96.5	96.5	< 0.005	< 0.005		96.8
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	< 0.005	< 0.005		0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	0.05	0.23	0.01	0.26	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	100	100	< 0.005	< 0.005	< 0.005	101

3. Construction Emissions Details

3.1. Demolition (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		

Off-Road Equ	2.14	1.79	17.4	17.2	0.02	0.78		0.78	0.71		0.71	2550	2550	0.1	0.02		2559
Demolition							0.22	0.22		0.03	0.03						
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																	
Off-Road Equ	0.06	0.05	0.48	0.47	< 0.005	0.02		0.02	0.02		0.02	69.9	69.9	< 0.005	< 0.005		70.1
Demolition							0.01	0.01		< 0.005	< 0.005						
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
Off-Road Equ	0.01	0.01	0.09	0.09	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	11.6	11.6	< 0.005	< 0.005		11.6
Demolition							< 0.005	< 0.005		< 0.005	< 0.005						
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																	
Daily, Summer (Max)																	
Daily, Winter (Max)																	
Worker	0.07	0.07	0.08	0.82	0	0	0.16	0.16	0	0.04	0.04	167	167	< 0.005	0.01	0.02	169
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	0.04	0.01	0.64	0.22	< 0.005	0.01	0.08	0.08	0.01	0.02	0.03	308	308	0.03	0.05	0.02	324
Average Daily																	
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	4.71	4.71	< 0.005	< 0.005	0.01	4.78
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	8.45	8.45	< 0.005	< 0.005	0.01	8.87
Annual																	
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0.78	0.78	< 0.005	< 0.005	< 0.005	0.79
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.4	1.4	< 0.005	< 0.005	< 0.005	1.47

3.2. Demolition (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	2.14	1.79	17.4	17.2	0.02	0.78		0.78	0.71		0.71		2550	2550	0.1	0.02		2559
Demolition							0.14	0.14		0.02	0.02							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equ	0.06	0.05	0.48	0.47	< 0.005	0.02		0.02	0.02		0.02		69.9	69.9	< 0.005	< 0.005		70.1
Demolition							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equ	0.01	0.01	0.09	0.09	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		11.6	11.6	< 0.005	< 0.005		11.6
Demolition							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.07	0.07	0.08	0.82	0	0	0.16	0.16	0	0.04	0.04		167	167	< 0.005	0.01	0.02	169

Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	0.04	0.01	0.64	0.22	< 0.005	0.01	0.08	0.08	0.01	0.02	0.03	308	308	0.03	0.05	0.02	324	
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	4.71	4.71	< 0.005	< 0.005	0.01	4.78	
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	8.45	8.45	< 0.005	< 0.005	0.01	8.87	
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0.78	0.78	< 0.005	< 0.005	< 0.005	0.79	
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.4	1.4	< 0.005	< 0.005	< 0.005	1.47	

3.3. Site Preparation (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	1.63	1.37	13.7	11.6	0.03	0.6		0.6	0.55		0.55	2716	2716	0.11	0.02		2725	
Dust From Material Movement							1.61	1.61		0.18	0.18							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Average Daily																		
Off-Road Equ	0.06	0.05	0.53	0.45	< 0.005	0.02		0.02	0.02		0.02	104	104	< 0.005	< 0.005		105	
Dust From Material Movement							0.06	0.06		0.01	0.01							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Annual																		
Off-Road Equ	0.01	0.01	0.1	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	17.2	17.2	< 0.005	< 0.005		17.3	
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.04	0.03	0.04	0.41	0	0	0.08	0.08	0	0.02	0.02	83.7	83.7	< 0.005	< 0.005	0.01	84.7	
Vendor	0.04	0.01	0.77	0.26	< 0.005	< 0.005	0.09	0.1	< 0.005	0.02	0.03	360	360	0.03	0.05	0.02	376	
Hauling	0.36	0.08	5.79	1.96	0.03	0.05	0.68	0.73	0.05	0.18	0.23	2774	2774	0.27	0.44	0.15	2912	
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	3.29	3.29	< 0.005	< 0.005	0.01	3.34	
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	13.8	13.8	< 0.005	< 0.005	0.02	14.4	
Hauling	0.01	< 0.005	0.22	0.07	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	106	106	0.01	0.02	0.09	112	
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0.55	0.55	< 0.005	< 0.005	< 0.005	0.55	
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	2.28	2.28	< 0.005	< 0.005	< 0.005	2.39	
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	17.6	17.6	< 0.005	< 0.005	0.02	18.5	

3.4. Site Preparation (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		

Daily, Winter (Max)																	
Off-Road Equ	1.63	1.37	13.7	11.6	0.03	0.6		0.6	0.55		0.55	2716	2716	0.11	0.02		2725
Dust From Material Movement							0.63	0.63		0.07	0.07						
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																	
Off-Road Equ	0.06	0.05	0.53	0.45	< 0.005	0.02		0.02	0.02		0.02	104	104	< 0.005	< 0.005		105
Dust From Material Movement							0.02	0.02		< 0.005	< 0.005						
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
Off-Road Equ	0.01	0.01	0.1	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	17.2	17.2	< 0.005	< 0.005		17.3
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005						
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																	
Daily, Summer (Max)																	
Daily, Winter (Max)																	
Worker	0.04	0.03	0.04	0.41	0	0	0.08	0.08	0	0.02	0.02	83.7	83.7	< 0.005	< 0.005	0.01	84.7
Vendor	0.04	0.01	0.77	0.26	< 0.005	< 0.005	0.09	0.1	< 0.005	0.02	0.03	360	360	0.03	0.05	0.02	376
Hauling	0.36	0.08	5.79	1.96	0.03	0.05	0.68	0.73	0.05	0.18	0.23	2774	2774	0.27	0.44	0.15	2912
Average Daily																	
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	3.29	3.29	< 0.005	< 0.005	0.01	3.34
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	13.8	13.8	< 0.005	< 0.005	0.02	14.4
Hauling	0.01	< 0.005	0.22	0.07	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	106	106	0.01	0.02	0.09	112
Annual																	
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0.55	0.55	< 0.005	< 0.005	< 0.005	0.55
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	2.28	2.28	< 0.005	< 0.005	< 0.005	2.39
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	17.6	17.6	< 0.005	< 0.005	0.02	18.5

3.5. Grading (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	2.12	1.78	17.5	16.3	0.02	0.83		0.83	0.77		0.77	2453	2453	0.1	0.02		2462	
Dust From Material Movement							7.08	7.08		3.42	3.42							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equ	0.03	0.03	0.29	0.27	< 0.005	0.01		0.01	0.01		0.01	40.3	40.3	< 0.005	< 0.005		40.5	
Dust From Material Movement							0.12	0.12		0.06	0.06							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equ	0.01	0.01	0.05	0.05	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	6.68	6.68	< 0.005	< 0.005		6.7	
Dust From Material Movement							0.02	0.02		0.01	0.01							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		

Worker	0.05	0.04	0.05	0.51	0	0	0.1	0.1	0	0.02	0.02		105	105	< 0.005	< 0.005	0.01	106
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		1.77	1.77	< 0.005	< 0.005	< 0.005	1.79
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		0.29	0.29	< 0.005	< 0.005	< 0.005	0.3
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.6. Grading (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	2.12	1.78	17.5	16.3	0.02	0.83		0.83	0.77		0.77		2453	2453	0.1	0.02		2462
Dust From Material Movement							2.76	2.76		1.34	1.34							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equ	0.03	0.03	0.29	0.27	< 0.005	0.01		0.01	0.01		0.01		40.3	40.3	< 0.005	< 0.005		40.5
Dust From Material Movement							0.05	0.05		0.02	0.02							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equ	0.01	0.01	0.05	0.05	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		6.68	6.68	< 0.005	< 0.005		6.7
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.05	0.04	0.05	0.51	0	0	0.1	0.1	0	0.02	0.02		105	105	< 0.005	< 0.005	0.01	106
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.01	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		1.77	1.77	< 0.005	< 0.005	< 0.005	1.79
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		0.29	0.29	< 0.005	< 0.005	< 0.005	0.3
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.7. Building Construction (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		

Daily, Summer (Max)																	
Daily, Winter (Max)																	
Off-Road Equ	3.23	2.71	20.9	22.7	0.07	0.78		0.78	0.72		0.72	6900	6900	0.28	0.06		6923
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																	
Off-Road Equ	0.4	0.33	2.57	2.8	0.01	0.1		0.1	0.09		0.09	851	851	0.03	0.01		854
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
Off-Road Equ	0.07	0.06	0.47	0.51	< 0.005	0.02		0.02	0.02		0.02	141	141	0.01	< 0.005		141
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																	
Daily, Summer (Max)																	
Daily, Winter (Max)																	
Worker	0.08	0.07	0.09	0.93	0	0	0.18	0.18	0	0.04	0.04	188	188	< 0.005	0.01	0.02	191
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	0.04	0.01	0.64	0.22	< 0.005	0.01	0.08	0.08	0.01	0.02	0.03	308	308	0.03	0.05	0.02	324
Average Daily																	
Worker	0.01	0.01	0.01	0.12	0	0	0.02	0.02	0	0.01	0.01	23.8	23.8	< 0.005	< 0.005	0.05	24.2
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	38	38	< 0.005	0.01	0.03	39.9
Annual																	
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	3.94	3.94	< 0.005	< 0.005	0.01	4
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	6.29	6.29	< 0.005	< 0.005	0.01	6.61

3.8. Building Construction (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	3.23	2.71	20.9	22.7	0.07	0.78		0.78	0.72		0.72		6900	6900	0.28	0.06		6923
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equ	0.4	0.33	2.57	2.8	0.01	0.1		0.1	0.09		0.09		851	851	0.03	0.01		854
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equ	0.07	0.06	0.47	0.51	< 0.005	0.02		0.02	0.02		0.02		141	141	0.01	< 0.005		141
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.08	0.07	0.09	0.93	0	0	0.18	0.18	0	0.04	0.04		188	188	< 0.005	0.01	0.02	191
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.04	0.01	0.64	0.22	< 0.005	0.01	0.08	0.08	0.01	0.02	0.03		308	308	0.03	0.05	0.02	324
Average Daily																		
Worker	0.01	0.01	0.01	0.12	0	0	0.02	0.02	0	0.01	0.01		23.8	23.8	< 0.005	< 0.005	0.05	24.2

Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	38	38	< 0.005	0.01	0.03	39.9
Annual																	
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	3.94	3.94	< 0.005	< 0.005	0.01	4
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	6.29	6.29	< 0.005	< 0.005	0.01	6.61

3.9. Building Construction (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equ	2.44	2.04	18.1	20	0.04	0.83		0.83	0.77		0.77		3902	3902	0.16	0.03		3915
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equ	2.44	2.04	18.1	20	0.04	0.83		0.83	0.77		0.77		3902	3902	0.16	0.03		3915
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equ	1.2	1	8.89	9.82	0.02	0.41		0.41	0.38		0.38		1914	1914	0.08	0.02		1920
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equ	0.22	0.18	1.62	1.79	< 0.005	0.07		0.07	0.07		0.07		317	317	0.01	< 0.005		318
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker	0.1	0.08	0.07	1.26	0	0	0.18	0.18	0	0.04	0.04		212	212	0.01	0.01	0.93	216
Vendor	0.03	0.01	0.48	0.17	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02		240	240	0.02	0.04	0.6	252
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
Worker	0.08	0.07	0.09	0.93	0	0	0.18	0.18	0	0.04	0.04		188	188	< 0.005	0.01	0.02	191
Vendor	0.03	0.01	0.51	0.17	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02		240	240	0.02	0.04	0.02	251
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Worker	0.04	0.04	0.04	0.46	0	0	0.09	0.09	0	0.02	0.02		94.8	94.8	< 0.005	< 0.005	0.2	96.2
Vendor	0.01	< 0.005	0.25	0.08	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01		118	118	0.01	0.02	0.13	123
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Worker	0.01	0.01	0.01	0.08	0	0	0.02	0.02	0	< 0.005	< 0.005		15.7	15.7	< 0.005	< 0.005	0.03	15.9
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		19.5	19.5	< 0.005	< 0.005	0.02	20.4
Hauling	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

3.10. Building Construction (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equ	2.44	2.04	18.1	20	0.04	0.83		0.83	0.77		0.77		3902	3902	0.16	0.03		3915
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

Daily, Winter (Max)																	
Off-Road Equ	2.44	2.04	18.1	20	0.04	0.83		0.83	0.77		0.77	3902	3902	0.16	0.03		3915
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																	
Off-Road Equ	1.2	1	8.89	9.82	0.02	0.41		0.41	0.38		0.38	1914	1914	0.08	0.02		1920
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
Off-Road Equ	0.22	0.18	1.62	1.79	< 0.005	0.07		0.07	0.07		0.07	317	317	0.01	< 0.005		318
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																	
Daily, Summer (Max)																	
Worker	0.1	0.08	0.07	1.26	0	0	0.18	0.18	0	0.04	0.04	212	212	0.01	0.01	0.93	216
Vendor	0.03	0.01	0.48	0.17	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	240	240	0.02	0.04	0.6	252
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily, Winter (Max)																	
Worker	0.08	0.07	0.09	0.93	0	0	0.18	0.18	0	0.04	0.04	188	188	< 0.005	0.01	0.02	191
Vendor	0.03	0.01	0.51	0.17	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	240	240	0.02	0.04	0.02	251
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																	
Worker	0.04	0.04	0.04	0.46	0	0	0.09	0.09	0	0.02	0.02	94.8	94.8	< 0.005	< 0.005	0.2	96.2
Vendor	0.01	< 0.005	0.25	0.08	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	118	118	0.01	0.02	0.13	123
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
Worker	0.01	0.01	0.01	0.08	0	0	0.02	0.02	0	< 0.005	< 0.005	15.7	15.7	< 0.005	< 0.005	0.03	15.9
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	19.5	19.5	< 0.005	< 0.005	0.02	20.4
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.11. Paving (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	0.92	0.78	6.66	8.27	0.01	0.33		0.33	0.31		0.31		1244	1244	0.05	0.01		1248
Paving		0.42																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equ	0.03	0.02	0.18	0.23	< 0.005	0.01		0.01	0.01		0.01		34.1	34.1	< 0.005	< 0.005		34.2
Paving		0.01																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equ	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		5.64	5.64	< 0.005	< 0.005		5.66
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		

Worker	0.07	0.07	0.08	0.82	0	0	0.16	0.16	0	0.04	0.04		167	167	< 0.005	0.01	0.02	169
Vendor	0.01	< 0.005	0.13	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005		59.9	59.9	< 0.005	0.01	< 0.005	62.7
Hauling	0.24	0.06	3.86	1.3	0.02	0.03	0.46	0.49	0.03	0.12	0.15		1849	1849	0.18	0.29	0.1	1941
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		4.71	4.71	< 0.005	< 0.005	0.01	4.78
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.64	1.64	< 0.005	< 0.005	< 0.005	1.72
Hauling	0.01	< 0.005	0.1	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		50.7	50.7	< 0.005	0.01	0.04	53.2
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		0.78	0.78	< 0.005	< 0.005	< 0.005	0.79
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		0.27	0.27	< 0.005	< 0.005	< 0.005	0.28
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		8.39	8.39	< 0.005	< 0.005	0.01	8.81

3.12. Paving (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	0.92	0.78	6.66	8.27	0.01	0.33		0.33	0.31		0.31		1244	1244	0.05	0.01		1248
Paving		0.42																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equ	0.03	0.02	0.18	0.23	< 0.005	0.01		0.01	0.01		0.01		34.1	34.1	< 0.005	< 0.005		34.2
Paving		0.01																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equ	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		5.64	5.64	< 0.005	< 0.005		5.66
Paving		< 0.005																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.07	0.07	0.08	0.82	0	0	0.16	0.16	0	0.04	0.04		167	167	< 0.005	0.01	0.02	169
Vendor	0.01	< 0.005	0.13	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005		59.9	59.9	< 0.005	0.01	< 0.005	62.7
Hauling	0.24	0.06	3.86	1.3	0.02	0.03	0.46	0.49	0.03	0.12	0.15		1849	1849	0.18	0.29	0.1	1941
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		4.71	4.71	< 0.005	< 0.005	0.01	4.78
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.64	1.64	< 0.005	< 0.005	< 0.005	1.72
Hauling	0.01	< 0.005	0.1	0.04	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		50.7	50.7	< 0.005	0.01	0.04	53.2
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005		0.78	0.78	< 0.005	< 0.005	< 0.005	0.79
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		0.27	0.27	< 0.005	< 0.005	< 0.005	0.28
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		8.39	8.39	< 0.005	< 0.005	0.01	8.81

3.13. Architectural Coating (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		

Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	0.18	0.15	0.93	1.15	< 0.005	0.04		0.04	0.03		0.03	134	134	0.01	< 0.005		134	
Architectural Coatings		19.1																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Average Daily																		
Off-Road Equ	0.01	0.01	0.04	0.05	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	6.22	6.22	< 0.005	< 0.005		6.24	
Architectural Coatings		0.89																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Annual																		
Off-Road Equ	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	1.03	1.03	< 0.005	< 0.005		1.03	
Architectural Coatings		0.16																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.04	0.03	0.04	0.41	0	0	0.08	0.08	0	0.02	0.02	83.7	83.7	< 0.005	< 0.005	0.01	84.7	
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	4	4	< 0.005	< 0.005	0.01	4.06	
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0.66	0.66	< 0.005	< 0.005	< 0.005	0.67	
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

3.14. Architectural Coating (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equ	0.18	0.15	0.93	1.15	< 0.005	0.04		0.04	0.03		0.03	134	134	0.01	< 0.005		134	
Architectural Coatings		19.1																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Average Daily																		
Off-Road Equ	0.01	0.01	0.04	0.05	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	6.22	6.22	< 0.005	< 0.005		6.24	
Architectural Coatings		0.89																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Annual																		
Off-Road Equ	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	1.03	1.03	< 0.005	< 0.005		1.03	
Architectural Coatings		0.16																
Onsite truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Offsite																		
Daily, Summer (Max)																		

Daily, Winter (Max)																	
Worker	0.04	0.03	0.04	0.41	0	0	0.08	0.08	0	0.02	0.02	83.7	83.7	< 0.005	< 0.005	0.01	84.7
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																	
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	4	4	< 0.005	< 0.005	0.01	4.06
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	< 0.005	< 0.005	0.66	0.66	< 0.005	< 0.005	< 0.005	0.67
Vendor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light	0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Other Asphal	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Daily, Winter (Max)																		
General Light	0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.65	9.65	< 0.005	< 0.005	< 0.005	9.81
Other Asphal	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.65	9.65	< 0.005	< 0.005	< 0.005	9.81
Annual																		
General Light	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.16	1.16	< 0.005	< 0.005	< 0.005	1.18
Other Asphal	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.16	1.16	< 0.005	< 0.005	< 0.005	1.18

4.1.2. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light	0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Other Asphal	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Daily, Winter (Max)																		
General Light	0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.65	9.65	< 0.005	< 0.005	< 0.005	9.81
Other Asphal	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.65	9.65	< 0.005	< 0.005	< 0.005	9.81
Annual																		
General Light	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.16	1.16	< 0.005	< 0.005	< 0.005	1.18
Other Asphal	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.16	1.16	< 0.005	< 0.005	< 0.005	1.18

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													583	583	0.02	< 0.005		584
Other Asphalt Surfaces													0	0	0		0	0
Total													583	583	0.02	< 0.005		584
Daily, Winter (Max)																		
General Light Industry													583	583	0.02	< 0.005		584
Other Asphalt Surfaces													0	0	0		0	0
Total													583	583	0.02	< 0.005		584
Annual																		
General Light Industry													96.5	96.5	< 0.005	< 0.005		96.8
Other Asphalt Surfaces													0	0	0		0	0
Total													96.5	96.5	< 0.005	< 0.005		96.8

4.2.2. Electricity Emissions By Land Use - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													583	583	0.02	< 0.005		584
Other Asphalt Surfaces													0	0	0		0	0
Total													583	583	0.02	< 0.005		584
Daily, Winter (Max)																		
General Light Industry													583	583	0.02	< 0.005		584
Other Asphalt Surfaces													0	0	0		0	0
Total													583	583	0.02	< 0.005		584
Annual																		
General Light Industry													96.5	96.5	< 0.005	< 0.005		96.8
Other Asphalt Surfaces													0	0	0		0	0
Total													96.5	96.5	< 0.005	< 0.005		96.8

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Other Asphal	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Total	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Daily, Winter (Max)																		
General Light	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Other Asphal	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Total	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Annual																		
General Light	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Other Asphal	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Total	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Other Asphal	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Total	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Daily, Winter (Max)																		
General Light	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Other Asphal	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Total	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Annual																		
General Light	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Other Asphal	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0
Total	0	0	0	0	0	0		0	0		0		0	0	0	0	0	0

4.3. Area Emissions by Source

4.3.2. Unmitigated

Source	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Consumer Products			0.95															
Architectural Coatings			0.09															
Landscape Ec	0.34		0.31	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Total	0.34		1.35	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Daily, Winter (Max)																		
Consumer Products			0.95															
Architectural Coatings			0.09															
Total			1.04															
Annual																		
Consumer Products			0.17															
Architectural Coatings			0.02															
Landscape Ec	0.04		0.04	< 0.005	0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9
Total	0.04		0.23	< 0.005	0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9

4.3.1. Mitigated

Source	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Consumer Products			0.95															
Architectural Coatings			0.09															
Landscape Ec	0.34		0.31	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Total	0.34		1.35	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Daily, Winter (Max)																		
Consumer Products			0.95															
Architectural Coatings			0.09															
Total			1.04															
Annual																		
Consumer Products			0.17															
Architectural Coatings			0.02															

Landscape Ec	0.04	0.04	< 0.005	0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9
Total	0.04	0.23	< 0.005	0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Daily, Winter (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Annual																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0

4.4.1. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Daily, Winter (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Annual																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Daily, Winter (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Annual																		

General Light Industry												0	0	0	0	0	0
Other Asphalt Surfaces												0	0	0	0	0	0
Total												0	0	0	0	0	0

4.5.1. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry												0	0	0	0	0	0	0
Other Asphalt Surfaces												0	0	0	0	0	0	0
Total												0	0	0	0	0	0	0
Daily, Winter (Max)																		
General Light Industry												0	0	0	0	0	0	0
Other Asphalt Surfaces												0	0	0	0	0	0	0
Total												0	0	0	0	0	0	0
Annual																		
General Light Industry												0	0	0	0	0	0	0
Other Asphalt Surfaces												0	0	0	0	0	0	0
Total												0	0	0	0	0	0	0

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.6.2. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Equipment T	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		

Total

4.7.2. Mitigated

Equipment T	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Equipment T	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Emergency G	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Daily, Winter (Max)																		
Emergency G	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Annual																		
Emergency G	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76

4.8.2. Mitigated

Equipment T	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Emergency G	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Daily, Winter (Max)																		
Emergency G	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total	1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Annual																		
Emergency G	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Equipment T	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.9.2. Mitigated

Equipment T	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Vegetation	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Species	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Daily, Winter (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		

Annual
Avoided
Subtotal
Sequestered
Subtotal
Removed
Subtotal

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Vegetation	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Species	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		

Daily, Winter (Max)
Avoided
Subtotal
Sequestered
Subtotal
Removed
Subtotal

Annual

Avoided
Subtotal
Sequestered
Subtotal
Removed
Subtotal

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Typ	Start Date	End Date	Days Per V	Work Days	Phase Description
Demolition	Demolitior	1/1/2023	1/14/2023	5	10	Well demo
Site Preparat	Site Prepa	1/17/2023	2/4/2023	5	14	Prep, clearing, grubbing, mobilization
Grading	Grading	2/7/2023	2/14/2023	5	6	
Drilling	Building C	2/15/2023	3/31/2023	7	45	Test and production well drilling
Construction	Building C	3/7/2023	11/10/2023	5	179	Test and production well testing and construction
Paving	Paving	11/11/2023	11/25/2023	5	10	
Coating	Architectu	11/28/2023	12/20/2023	5	17	

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipmen	Fuel Type	Engine Tier	Number p	Hours Per	Horsepow	Load Factor
Demolition	Concrete/I	Diesel	Average	1	8	33	0.73
Demolition	Rubber Tir	Diesel	Average	1	8	367	0.4
Demolition	Tractors/L	Diesel	Average	3	8	84	0.37
Site Preparat	Graders	Diesel	Average	1	8	148	0.41
Site Preparat	Scrapers	Diesel	Average	1	8	423	0.48
Site Preparat	Tractors/L	Diesel	Average	1	7	84	0.37
Grading	Graders	Diesel	Average	1	8	148	0.41
Grading	Rubber Tir	Diesel	Average	1	8	367	0.4
Grading	Tractors/L	Diesel	Average	2	7	84	0.37
Drilling	Welders	Diesel	Average	1	8	46	0.45
Construction	Tractors/L	Diesel	Average	4	7	84	0.37
Construction	Cranes	Diesel	Average	1	8	367	0.29
Construction	Forklifts	Diesel	Average	5	7	82	0.2
Construction	Generator	Diesel	Average	1	8	14	0.74
Construction	Welders	Diesel	Average	1	8	46	0.45
Paving	Cement ar	Diesel	Average	1	8	10	0.56
Paving	Pavers	Diesel	Average	1	8	81	0.42
Paving	Paving Eq	Diesel	Average	1	8	89	0.36
Paving	Rollers	Diesel	Average	2	8	36	0.38
Paving	Tractors/L	Diesel	Average	1	8	84	0.37
Coating	Air Compr	Diesel	Average	1	6	37	0.48
Demolition	Cement ar	Diesel	Average	1	8	10	0.56
Drilling	Bore/Drill	Diesel	Average	1	24	83	0.5
Drilling	Off-Highw	Diesel	Average	4	8	376	0.38

Drilling	Pumps	Diesel	Average	1	8	11	0.74
Drilling	Air Compr	Diesel	Average	1	6	37	0.48
Construction	Off-Highw	Diesel	Average	1	4	376	0.38
Construction	Pumps	Diesel	Average	1	6	11	0.74
Construction	Cement ar	Diesel	Average	1	8	10	0.56
Construction	Air Compr	Diesel	Average	1	6	37	0.48

5.2.2. Mitigated

Phase Name	Equipmen	Fuel Type	Engine Tier	Number p	Hours Per	Horsepow	Load Factor
Demolition	Concrete/	Diesel	Average	1	8	33	0.73
Demolition	Rubber Tir	Diesel	Average	1	8	367	0.4
Demolition	Tractors/L	Diesel	Average	3	8	84	0.37
Site Preparat	Graders	Diesel	Average	1	8	148	0.41
Site Preparat	Scrapers	Diesel	Average	1	8	423	0.48
Site Preparat	Tractors/L	Diesel	Average	1	7	84	0.37
Grading	Graders	Diesel	Average	1	8	148	0.41
Grading	Rubber Tir	Diesel	Average	1	8	367	0.4
Grading	Tractors/L	Diesel	Average	2	7	84	0.37
Drilling	Welders	Diesel	Average	1	8	46	0.45
Construction	Tractors/L	Diesel	Average	4	7	84	0.37
Construction	Cranes	Diesel	Average	1	8	367	0.29
Construction	Forklifts	Diesel	Average	5	7	82	0.2
Construction	Generator	Diesel	Average	1	8	14	0.74
Construction	Welders	Diesel	Average	1	8	46	0.45
Paving	Cement ar	Diesel	Average	1	8	10	0.56
Paving	Pavers	Diesel	Average	1	8	81	0.42
Paving	Paving Eq	Diesel	Average	1	8	89	0.36
Paving	Rollers	Diesel	Average	2	8	36	0.38
Paving	Tractors/L	Diesel	Average	1	8	84	0.37
Coating	Air Compr	Diesel	Average	1	6	37	0.48
Demolition	Cement ar	Diesel	Average	1	8	10	0.56
Drilling	Bore/Drill	Diesel	Average	1	24	83	0.5
Drilling	Off-Highw	Diesel	Average	4	8	376	0.38
Drilling	Pumps	Diesel	Average	1	8	11	0.74
Drilling	Air Compr	Diesel	Average	1	6	37	0.48
Construction	Off-Highw	Diesel	Average	1	4	376	0.38
Construction	Pumps	Diesel	Average	1	6	11	0.74
Construction	Cement ar	Diesel	Average	1	8	10	0.56
Construction	Air Compr	Diesel	Average	1	6	37	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Tri	Miles per Tri	Vehicle Mix
Demolition				
Demolition	Worker	16	14.3	LDA,LDT1,LDT2
Demolition	Vendor		8.8	HHDT,MHDT

Demolition	Hauling	4	20	HHDT
Demolition	Onsite truck			HHDT
Site Preparation				
Site Preparat	Worker	8	14.3	LDA,LDT1,LDT2
Site Preparat	Vendor	12	8.8	HHDT,MHDT
Site Preparat	Hauling	36	20	HHDT
Site Preparat	Onsite truck			HHDT
Grading				
Grading	Worker	10	14.3	LDA,LDT1,LDT2
Grading	Vendor		8.8	HHDT,MHDT
Grading	Hauling	0	20	HHDT
Grading	Onsite truck			HHDT
Drilling				
Drilling	Worker	18	14.3	LDA,LDT1,LDT2
Drilling	Vendor	0	8.8	HHDT,MHDT
Drilling	Hauling	4	20	HHDT
Drilling	Onsite truck			HHDT
Construction				
Construction	Worker	18	14.3	LDA,LDT1,LDT2
Construction	Vendor	8	8.8	HHDT,MHDT
Construction	Hauling	0	20	HHDT
Construction	Onsite truck			HHDT
Paving				
Paving	Worker	16	14.3	LDA,LDT1,LDT2
Paving	Vendor	2	8.8	HHDT,MHDT
Paving	Hauling	24	20	HHDT
Paving	Onsite truck			HHDT
Coating				
Coating	Worker	8	14.3	LDA,LDT1,LDT2
Coating	Vendor		8.8	HHDT,MHDT
Coating	Hauling	0	20	HHDT
Coating	Onsite truck			HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Tri	Miles per Tri	Vehicle Mix
Demolition				
Demolition	Worker	16	14.3	LDA,LDT1,LDT2
Demolition	Vendor		8.8	HHDT,MHDT
Demolition	Hauling	4	20	HHDT
Demolition	Onsite truck			HHDT
Site Preparation				
Site Preparat	Worker	8	14.3	LDA,LDT1,LDT2
Site Preparat	Vendor	12	8.8	HHDT,MHDT
Site Preparat	Hauling	36	20	HHDT
Site Preparat	Onsite truck			HHDT
Grading				

Grading	Worker	10	14.3	LDA,LDT1,LDT2
Grading	Vendor		8.8	HHDT,MHDT
Grading	Hauling	0	20	HHDT
Grading	Onsite truck			HHDT
Drilling				
Drilling	Worker	18	14.3	LDA,LDT1,LDT2
Drilling	Vendor	0	8.8	HHDT,MHDT
Drilling	Hauling	4	20	HHDT
Drilling	Onsite truck			HHDT
Construction				
Construction	Worker	18	14.3	LDA,LDT1,LDT2
Construction	Vendor	8	8.8	HHDT,MHDT
Construction	Hauling	0	20	HHDT
Construction	Onsite truck			HHDT
Paving				
Paving	Worker	16	14.3	LDA,LDT1,LDT2
Paving	Vendor	2	8.8	HHDT,MHDT
Paving	Hauling	24	20	HHDT
Paving	Onsite truck			HHDT
Coating				
Coating	Worker	8	14.3	LDA,LDT1,LDT2
Coating	Vendor		8.8	HHDT,MHDT
Coating	Hauling	0	20	HHDT
Coating	Onsite truck			HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strat	PM10 Red	PM2.5 Reduction

5.5. Architectural Coatings

Phase Name	Residentia	Residential E	Non-Residen	Non-Resid	Parking Area Coated (sq ft)
Coating	0	0	66000	22000	4140

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Ir	Material Exp	Acres Grade	Material D	Acres Paved (acres)
Demolition	0	0	0	2100	
Site Preparat	0	4000	21	0	
Grading			6	0	
Paving	0	0	0	0	1.58

5.6.2. Construction Earthmoving Control Strategies

Control Strat	Frequency	PM10 Reduc	PM2.5 Reduction

5.7. Construction Paving

Land Use	Area Pave	% Asphalt

General Light	0	0
Other Asphal	1.58	100

5.8. Construction Electricity Consumption and Emissions Factors

Year	kWh per Y	CO2	CH4	N2O
2023	0	375	0.01	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Typ	Trips/Wee	Trips/Saturd	Trips/Sunday	Trips/Year	VMT/Wee	VMT/Satu	VMT/Sund	VMT/Year
General Light	1.01	0	0	264	11.7	0	0	3052
Other Asphal	0	0	0	0	0	0	0	0

5.9.2. Mitigated

Land Use Typ	Trips/Wee	Trips/Saturd	Trips/Sunday	Trips/Year	VMT/Wee	VMT/Satu	VMT/Sund	VMT/Year
General Light	1.01	0	0	264	11.7	0	0	3052
Other Asphal	0	0	0	0	0	0	0	0

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)

5.10.2. Architectural Coatings

Residential Ir	Residentia	Non-Residen	Non-Residen	Parking Area Coated (sq ft)
0	0	66000	22000	4140

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0
Summer Day	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0
Summer Day	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Land Use	Electricity	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light	681858	312	0.0129	0.0017	0
Other Asphal	0	312	0.0129	0.0017	0

5.11.2. Mitigated

Land Use	Electricity	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light	681858	312	0.0129	0.0017	0
Other Asphal	0	312	0.0129	0.0017	0

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Wa	Outdoor Water (gal/year)
General Light	0	0
Other Asphal	0	0

5.12.2. Mitigated

Land Use	Indoor Wa	Outdoor Water (gal/year)
General Light	0	0
Other Asphal	0	0

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (to	Cogeneration (kWh/year)
General Light	0	0
Other Asphal	0	0

5.13.2. Mitigated

Land Use	Waste (to	Cogeneration (kWh/year)
General Light	0	0
Other Asphal	0	0

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Typ	Equipmen	Refrigerant	GWP	Quantity (l	Operation	Service Le	Times Serviced

5.14.2. Mitigated

Land Use Typ	Equipmen	Refrigerant	GWP	Quantity (l	Operation	Service Le	Times Serviced

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment T	Fuel Type	Engine Tier	Number per	Hours Per	Horsepow	Load Factor

5.15.2. Mitigated

Equipment T	Fuel Type	Engine Tier	Number per	Hours Per	Horsepow	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment T	Fuel Type	Number per	Hours per Da	Hours per	Horsepow	Load Factor
Emergency G	Diesel	1	8	40	115	0.73

5.16.2. Process Boilers

Equipment T	Fuel Type	Number	Boiler Rating	Daily Heat Input	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment T	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation L	Vegetatior	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation L	Vegetatior	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cov	Initial Acre	Final Acres

5.18.1.2. Mitigated

Biomass Cov	Initial Acre	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Sa	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Sa	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emission

Climate Haza	Result for	Unit
Temperature	20.2	annual days of extreme heat
Extreme Prec	6	annual days with precipitation above 20 mm
Sea Level Ris	0	meters of inundation depth
Wildfire	0	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical c

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different incremen

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetatic

6.2. Initial Climate Risk Scores

Climate Haza	Exposure S	Sensitivity Sc	Adaptive Cap	Vulnerability Score
Temperature	N/A	N/A	N/A	N/A
Extreme Prec	N/A	N/A	N/A	N/A

Sea Level Ris	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Re	N/A	N/A	N/A	N/A
Air Quality D	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Haza	Exposure S	Sensitivity Sc	Adaptive Cap	Vulnerability Score
Temperature	N/A	N/A	N/A	N/A
Extreme Prec	N/A	N/A	N/A	N/A
Sea Level Ris	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Re	N/A	N/A	N/A	N/A
Air Quality D	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	
AQ-Ozone	50.5
AQ-PM	37.6
AQ-DPM	69.9
Drinking Wat	16.8
Lead Risk Ho	79
Pesticides	0
Toxic Release	29.2
Traffic	32.4
Effect Indicators	
CleanUp Site	87.2
Groundwate	93.8
Haz Waste Fa	80.2
Impaired Wa	77.3
Solid Waste	22.1
Sensitive Population	
Asthma	99.5

Cardio-vascu	97.1
Low Birth We	76.1
Socioeconomic Factor Indicators	
Education	60.6
Housing	93.6
Linguistic	
Poverty	94.1
Unemployme	95.5

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	
Above Poverl	11.54883
Employed	2.989863
Median HI	2.951367
Education	
Bachelor's or	43.64173
High school e	0.551777
Preschool en	67.11151
Transportation	
Auto Access	6.467342
Active comm	37.39253
Social	
2-parent hou	13.17849
Voting	40.74169
Neighborhood	
Alcohol availa	30.25792
Park access	81.35506
Retail density	79.26344
Supermarket	52.34185
Tree canopy	89.20826
Housing	
Homeowners	23.32863
Housing habi	26.71628
Low-inc hom	9.149236
Low-inc rente	31.63095
Uncrowded h	51.79007
Health Outcomes	
Insured adult	22.55871
Arthritis	4.4
Asthma ER A	1.4
High Blood P	5.4
Cancer (exclu	23
Asthma	8.7
Coronary Hea	3.6

Chronic Obst	2.8
Diagnosed Di	14
Life Expectan	3
Cognitively D	17
Physically Di	3.8
Heart Attack	4
Mental Healt	20
Chronic Kidn	11
Obesity	14
Pedestrian In	97
Physical Heal	15
Stroke	6.5
Health Risk Behaviors	
Binge Drinkin	79
Current Smol	10
No Leisure Ti	31
Climate Change Exposures	
Wildfire Risk	0
SLR Inundatic	0
Children	72
Elderly	40
English Speak	28
Foreign-born	36
Outdoor Wor	71
Climate Change Adaptive Capacity	
Impervious S	47
Traffic Densit	33
Traffic Access	74
Other Indices	
Hardship	86
Other Decision Support	
2016 Voting	22

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScre	94
Healthy Place	2
Project Locat	Yes
Project Locat	Yes
Project Locat	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

Measure Title	Co-Benefits Achieved

7.5. Evaluation Scorecard

Category	Number o	Total Points	Max Possible	Weighted Score

7.6. Health & Equity Custom Measures

Measure Titl	Sponsor

8. User Changes to Default Data

Screen	Justification
Construction	per project description
Construction	per project description
Operations: \	per project description
Operations: E	per project description
Operations: \	no net change
Operations: S	no net change
Operations: F	well building would not be climate controlled
Construction	per project description

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Sac GW Master Plan - Single Well - Wet Year
Lead Agency	City of Sacramento
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.5
Precipitation (days)	36.4
Location	38.59694156972523, -121.45572359088179
County	Sacramento
City	Sacramento
Air District	Sacramento Metropolitan AQMD
Air Basin	Sacramento Valley
TAZ	521
EDFZ	13
Electric Utility	Sacramento Municipal Utility District
Gas Utility	Pacific Gas & Electric

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq	Special Landscape Area	Population	Description
General Light Industry	44	1000sqft	1.01	44000	0			
Other Asphalt Surfaces	69	1000sqft	1.58	0	0			

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-B	Water Active Demolition Sites
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Un/Mit.	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Unmit.		2.39	1.99	17.7	20.3	0.04	0.8	0.24	1.04	0.74	0.06	0.79	4203	4203	0.18	0.07	1.49	4229
Mit.		2.39	1.99	17.7	20.3	0.04	0.8	0.24	1.04	0.74	0.06	0.79	4203	4203	0.18	0.07	1.49	4229
% Reduced																		
Daily, Winter (Max)																		
Unmit.		5.71	20.2	39.2	43.8	0.1	1.59	7.18	8.02	1.46	3.45	4.22	11487	11487	0.47	0.46	0.16	11548
Mit.		5.71	20.2	39.2	43.8	0.1	1.59	2.86	3.7	1.46	1.36	2.13	11487	11487	0.47	0.46	0.16	11548
% Reduced								60.1	53.9		60.6	49.6						
Average Daily (Max)																		
Unmit.		1.79	2.43	13.1	14.4	0.03	0.56	0.37	0.93	0.52	0.11	0.63	3336	3336	0.15	0.07	0.53	3360
Mit.		1.79	2.43	13.1	14.4	0.03	0.56	0.26	0.82	0.52	0.07	0.59	3336	3336	0.15	0.07	0.53	3360
% Reduced								29.8	11.9		35.3	6.2						
Annual (Max)																		
Unmit.		0.33	0.44	2.39	2.62	0.01	0.1	0.07	0.17	0.09	0.02	0.11	552	552	0.02	0.01	0.09	556
Mit.		0.33	0.44	2.39	2.62	0.01	0.1	0.05	0.15	0.09	0.01	0.11	552	552	0.02	0.01	0.09	556
% Reduced								29.8	11.9		35.3	6.2						
Exceeds (Daily Max)																		
Threshold				85					80			82						
Unmit.			No					No			No			Yes				Yes
Mit.			No					No			No			Yes				Yes
Exceeds (Average Daily)																		
Threshold				85					80			82						
Unmit.			No					No			No			Yes				Yes
Mit.			No					No			No			Yes				Yes
Exceeds (Annual)																		
Threshold																		1100
Unmit.																		No
Mit.																		No

2.2. Construction Emissions by Year, Unmitigated

Year	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																		
2023		2.39	1.99	17.7	20.3	0.04	0.8	0.24	1.04	0.74	0.06	0.79	4203	4203	0.18	0.07	1.49	4229
Daily - Winter (Max)																		
2023		5.71	20.2	39.2	43.8	0.1	1.59	7.18	8.02	1.46	3.45	4.22	11487	11487	0.47	0.46	0.16	11548
Average Daily																		
2023		1.79	2.43	13.1	14.4	0.03	0.56	0.37	0.93	0.52	0.11	0.63	3336	3336	0.15	0.07	0.53	3360
Annual																		
2023		0.33	0.44	2.39	2.62	0.01	0.1	0.07	0.17	0.09	0.02	0.11	552	552	0.02	0.01	0.09	556

2.3. Construction Emissions by Year, Mitigated

Year	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily - Summer (Max)																		
2023		2.39	1.99	17.7	20.3	0.04	0.8	0.24	1.04	0.74	0.06	0.79	4203	4203	0.18	0.07	1.49	4229
Daily - Winter (Max)																		
2023		5.71	20.2	39.2	43.8	0.1	1.59	2.86	3.7	1.46	1.36	2.13	11487	11487	0.47	0.46	0.16	11548
Average Daily																		
2023		1.79	2.43	13.1	14.4	0.03	0.56	0.26	0.82	0.52	0.07	0.59	3336	3336	0.15	0.07	0.53	3360
Annual																		
2023		0.33	0.44	2.39	2.62	0.01	0.1	0.05	0.15	0.09	0.01	0.11	552	552	0.02	0.01	0.09	556

2.4. Operations Emissions Compared Against Thresholds

Un/Mit.	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Unmit.		2	2.87	4.24	7.44	0.01	0.22	< 0.005	0.23	0.23	< 0.005	0.23	0	1250	1250	0.05	0.01	0.04	1254
Daily, Winter (Max)																		
Unmit.		1.66	2.55	4.23	5.52	0.01	0.22	< 0.005	0.23	0.22	< 0.005	0.22	0	1241	1241	0.05	0.01	< 0.005	1245
Average Daily (Max)																		
Unmit.		0.26	1.28	0.07	1.41	< 0.005	< 0.005		0.01	0.01	< 0.005	0.01	0	482	482	0.02	< 0.005	0.01	483
Annual (Max)																		
Unmit.		0.05	0.23	0.01	0.26	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	79.8	79.8	< 0.005	< 0.005	< 0.005	80
Exceeds (Daily Max)																		
Threshold			65	65					80			82						
Unmit.		No	No					No			No							
Exceeds (Average Daily)																		
Threshold			65	65					80			82						
Unmit.		No	No					No			No							
Exceeds (Annual)																		
Threshold																		1100
Unmit.																		No

2.5. Operations Emissions by Sector, Unmitigated

Sector	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Mobile		0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Area		0.34	1.35	0.02	1.91	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Energy		0	0	0	0	0	0		0	0	0		459	459	0.02	< 0.005		460
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary		1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total		2	2.87	4.24	7.44	0.01	0.22	< 0.005	0.23	0.23	< 0.005	0.23	0	1250	1250	0.05	0.01	0.04	1254
Daily, Winter (Max)																		
Mobile		0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.66	9.66	< 0.005	< 0.005	< 0.005	9.82
Area			1.04															
Energy		0	0	0	0	0	0		0	0	0		459	459	0.02	< 0.005		460
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary		1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total		1.66	2.55	4.23	5.52	0.01	0.22	< 0.005	0.23	0.22	< 0.005	0.22	0	1241	1241	0.05	0.01	< 0.005	1245
Average Daily																		
Mobile	< 0.005		< 0.005	< 0.005		0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		7.04	7.04	< 0.005	< 0.005	0.01	7.16
Area		0.23	1.25	0.01	1.31	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		5.39	5.39	< 0.005	< 0.005		5.41
Energy		0	0	0	0	0	0		0	0	0		459	459	0.02	< 0.005		460
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary		0.02	0.02	0.06	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		10.6	10.6	< 0.005	< 0.005		10.6
Total		0.26	1.28	0.07	1.41	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	0.01	0	482	482	0.02	< 0.005	0.01	483
Annual																		
Mobile	< 0.005		< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.17	1.17	< 0.005	< 0.005	< 0.005	1.18
Area		0.04	0.23	< 0.005		0.24	< 0.005	< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9
Energy		0	0	0	0	0	0		0	0	0		76	76	< 0.005	< 0.005		76.2
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary	< 0.005		< 0.005		0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total		0.05	0.23	0.01	0.26	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	79.8	79.8	< 0.005	< 0.005	< 0.005	80

2.6. Operations Emissions by Sector, Mitigated

Sector	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Mobile		0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Area		0.34	1.35	0.02	1.91	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		7.87	7.87	< 0.005	< 0.005		7.9
Energy		0	0	0	0	0	0		0	0	0		459	459	0.02	< 0.005		460
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary		1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total		2	2.87	4.24	7.44	0.01	0.22	< 0.005	0.23	0.23	< 0.005	0.23	0	1250	1250	0.05	0.01	0.04	1254
Daily, Winter (Max)																		
Mobile		0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.66	9.66	< 0.005	< 0.005	< 0.005	9.82
Area			1.04															
Energy		0	0	0	0	0	0		0	0	0		459	459	0.02	< 0.005		460
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary		1.66	1.51	4.22	5.48	0.01	0.22		0.22	0.22		0.22		772	772	0.03	0.01		775
Total		1.66	2.55	4.23	5.52	0.01	0.22	< 0.005	0.23	0.22	< 0.005	0.22	0	1241	1241	0.05	0.01	< 0.005	1245
Average Daily																		
Mobile	< 0.005		< 0.005	< 0.005		0.03	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		7.04	7.04	< 0.005	< 0.005	0.01	7.16
Area		0.23	1.25	0.01	1.31	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		5.39	5.39	< 0.005	< 0.005		5.41
Energy		0	0	0	0	0	0		0	0	0		459	459	0.02	< 0.005		460
Water												0	0	0	0	0		0
Waste												0	0	0	0	0		0
Stationary		0.02	0.02	0.06	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		10.6	10.6	< 0.005	< 0.005		10.6
Total		0.26	1.28	0.07	1.41	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	0.01	0	482	482	0.02	< 0.005	0.01	483
Annual																		
Mobile	< 0.005		< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.17	1.17	< 0.005	< 0.005	< 0.005	1.18
Area		0.04	0.23	< 0.005		0.24	< 0.005	< 0.005	< 0.005		< 0.005		0.89	0.89	< 0.005	< 0.005		0.9
Energy		0	0	0	0	0	0		0	0	0		76	76	< 0.005	< 0.005		76.2
Water												0	0	0	0	0		0

Waste												0	0	0	0	0		0
Stationary	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	0.05	0.23	0.01	0.26	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0	79.8	79.8	< 0.005	< 0.005	< 0.005	80

3. Construction Emissions Details

3.1. Demolition (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	2.14	1.79	17.4	17.2	0.02	0.78		0.78	0.71		0.71		2550	2550	0.1	0.02		2559
Demolition							0.22	0.22		0.03	0.03							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.06	0.05	0.48	0.47	< 0.005	0.02		0.02	0.02		0.02		69.9	69.9	< 0.005	< 0.005		70.1
Demolition							0.01	0.01		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.09	0.09	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		11.6	11.6	< 0.005	< 0.005		11.6
Demolition							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.07	0.06	0.07	0.77	0	0	0.01	0.01	0	0	0		157	157	< 0.005	0.01	0.02	159
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.02	0.01	0.4	0.14	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01		193	193	0.02	0.03	0.01	202
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	0	0		4.41	4.41	< 0.005	< 0.005	0.01	4.48
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		5.28	5.28	< 0.005	< 0.005	< 0.005	5.54
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	0	0		0.73	0.73	< 0.005	< 0.005	< 0.005	0.74
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		0.87	0.87	< 0.005	< 0.005	< 0.005	0.92

3.2. Demolition (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	2.14	1.79	17.4	17.2	0.02	0.78		0.78	0.71		0.71		2550	2550	0.1	0.02		2559
Demolition							0.14	0.14		0.02	0.02							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.06	0.05	0.48	0.47	< 0.005	0.02		0.02	0.02		0.02		69.9	69.9	< 0.005	< 0.005		70.1
Demolition							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.09	0.09	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		11.6	11.6	< 0.005	< 0.005		11.6
Demolition							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.07	0.06	0.07	0.77	0	0	0.01	0.01	0	0	0		157	157	< 0.005	0.01	0.02	159
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	0.02	0.01	0.4	0.14	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01		193	193	0.02	0.03	0.01	202
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005	0.02	0	0	< 0.005	< 0.005	0	0	0		4.41	4.41	< 0.005	< 0.005	0.01	4.48
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		5.28	5.28	< 0.005	< 0.005	< 0.005	5.54
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0	0	< 0.005	< 0.005	0	0	0		0.73	0.73	< 0.005	< 0.005	< 0.005	0.74
Vendor	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		0.87	0.87	< 0.005	< 0.005	< 0.005	0.92

3.3. Site Preparation (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment	1.63	1.37	13.7	11.6	0.03	0.6		0.6	0.55		0.55		2716	2716	0.11	0.02		2725
Dust From Material Movement							1.61	1.61		0.18	0.18							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Average Daily																		
Off-Road Equipment	0.06	0.05	0.53	0.45	< 0.005	0.02		0.02	0.02		0.02		104	104	< 0.005	< 0.005		105
Dust From Material Movement							0.06	0.06		0.01	0.01							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
Off-Road Equipment	0.01	0.01	0.1	0.08	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005		17.2	17.2	< 0.005	< 0.005		17.3
Dust From Material Movement							0.01	0.01		< 0.005	< 0.005							
Onsite truck	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker	0.03	0.03	0.04	0.39	0	0	< 0.005	< 0.005	0	0	0		78.5	78.5	< 0.005	< 0.005	0.01	79.4

Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0.36	0.08	5.74	1.94	0.03	0.05	0.2	0.25	0.05	0.06	0.11	2752	2752	0.27	0.44	0.15	2888
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	3.09	3.09	< 0.005	< 0.005	0.01	3.13
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0.01	< 0.005	0.22	0.07	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		106	106	0.01	0.02	0.09	111
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.51	0.51	< 0.005	< 0.005	< 0.005	0.52
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005		0.04	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		17.5	17.5	< 0.005	< 0.005	0.02	18.4

3.4. Site Preparation (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		1.63	1.37	13.7	11.6	0.03	0.6		0.6	0.55		0.55	2716	2716	0.11	0.02		2725
Dust From Material Movement								0.63	0.63		0.07	0.07						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.06	0.05	0.53	0.45	< 0.005	0.02		0.02	0.02		0.02	104	104	< 0.005	< 0.005		105
Dust From Material Movement								0.02	0.02		< 0.005	< 0.005						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.01	0.01	0.1	0.08	< 0.005		< 0.005	< 0.005		< 0.005		17.2	17.2	< 0.005	< 0.005		17.3
Dust From Material Movement							< 0.005	< 0.005		< 0.005	< 0.005							
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.03	0.03	0.04	0.39	0	0	< 0.005	< 0.005	0	0	0	78.5	78.5	< 0.005	< 0.005	0.01	79.4
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0.36	0.08	5.74	1.94	0.03	0.05	0.2	0.25	0.05	0.06	0.11	2752	2752	0.27	0.44	0.15	2888
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	3.09	3.09	< 0.005	< 0.005	0.01	3.13
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0.01	< 0.005	0.22	0.07	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005		106	106	0.01	0.02	0.09	111
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.51	0.51	< 0.005	< 0.005	< 0.005	0.52
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling	< 0.005	< 0.005		0.04	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		17.5	17.5	< 0.005	< 0.005	0.02	18.4

3.5. Grading (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		2.12	1.78	17.5	16.3	0.02	0.83		0.83	0.77		0.77	2453	2453	0.1	0.02		2462
Dust From Material Movement								7.08	7.08		3.42	3.42						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.03	0.03	0.29	0.27	< 0.005	0.01		0.01	0.01		0.01	40.3	40.3	< 0.005	< 0.005		40.5
Dust From Material Movement								0.12	0.12		0.06	0.06						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.01	0.01	0.05	0.05	< 0.005		< 0.005	< 0.005		< 0.005		6.68	6.68	< 0.005	< 0.005		6.7
Dust From Material Movement								0.02	0.02		0.01	0.01						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.05	0.04	0.05	0.51	0	0	0.01	0.01	0	0	0	105	105	< 0.005	< 0.005	0.01	106
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005		0.01	0	0	< 0.005	< 0.005	0	0	0	1.77	1.77	< 0.005	< 0.005	< 0.005	1.79
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.29	0.29	< 0.005	< 0.005	< 0.005	0.3
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.6. Grading (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		2.12	1.78	17.5	16.3	0.02	0.83		0.83	0.77		0.77	2453	2453	0.1	0.02		2462
Dust From Material Movement								2.76	2.76		1.34	1.34						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.03	0.03	0.29	0.27	< 0.005	0.01		0.01	0.01		0.01	40.3	40.3	< 0.005	< 0.005		40.5
Dust From Material Movement								0.05	0.05		0.02	0.02						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.01	0.01	0.05	0.05	< 0.005		< 0.005	< 0.005		< 0.005		6.68	6.68	< 0.005	< 0.005		6.7

Dust From Material Movement												0.01	0.01	< 0.005	< 0.005									
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																								
Daily, Summer (Max)																								
Daily, Winter (Max)																								
Worker		0.05	0.04	0.05	0.51	0	0	0.01	0.01	0	0	0	105	105	< 0.005	< 0.005	0.01	106						
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Average Daily																								
Worker	< 0.005	< 0.005	< 0.005		0.01	0	0	< 0.005	< 0.005	0	0	0	1.77	1.77	< 0.005	< 0.005	< 0.005	1.79						
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Annual																								
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.29	0.29	< 0.005	< 0.005	< 0.005	0.3						
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						

3.7. Building Construction (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		3.23	2.71	20.9	22.7	0.07	0.78		0.78	0.72		0.72	6900	6900	0.28	0.06		6923
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.4	0.33	2.57	2.8	0.01	0.1		0.1	0.09		0.09	851	851	0.03	0.01		854
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.07	0.06	0.47	0.51	< 0.005	0.02		0.02	0.02		0.02	141	141	0.01	< 0.005		141
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.08	0.08	0.09	0.95	0	0	0.01	0.01	0	0	0	193	193	< 0.005	0.01	0.02	196
Vendor		0.03	0.01	0.46	0.16	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	216	216	0.02	0.03	0.01	226
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Worker		0.01	0.01	0.01	0.12	0	0	< 0.005	< 0.005	0	0	0	24.5	24.5	< 0.005	< 0.005	0.05	24.8
Vendor	< 0.005	< 0.005		0.06	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		26.7	26.7	< 0.005	< 0.005	0.03	27.9
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	4.05	4.05	< 0.005	< 0.005	0.01	4.11
Vendor	< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		4.41	4.41	< 0.005	< 0.005	< 0.005	4.62
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.8. Building Construction (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		3.23	2.71	20.9	22.7	0.07	0.78		0.78	0.72		0.72	6900	6900	0.28	0.06		6923
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.4	0.33	2.57	2.8	0.01	0.1		0.1	0.09		0.09	851	851	0.03	0.01		854
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.07	0.06	0.47	0.51	< 0.005	0.02		0.02	0.02		0.02	141	141	0.01	< 0.005		141
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.08	0.08	0.09	0.95	0	0	0.01	0.01	0	0	0	193	193	< 0.005	0.01	0.02	196
Vendor		0.03	0.01	0.46	0.16	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	0.01	216	216	0.02	0.03	0.01	226
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Worker		0.01	0.01	0.01	0.12	0	0	< 0.005	< 0.005	0	0	0	24.5	24.5	< 0.005	< 0.005	0.05	24.8
Vendor	< 0.005	< 0.005		0.06	0.02	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		26.7	26.7	< 0.005	< 0.005	0.03	27.9
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	4.05	4.05	< 0.005	< 0.005	0.01	4.11
Vendor	< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		4.41	4.41	< 0.005	< 0.005	< 0.005	4.62
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.9. Building Construction (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment		2.26	1.9	17.2	18.9	0.04	0.8		0.8	0.73		0.73	3768	3768	0.15	0.03		3781
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment		2.26	1.9	17.2	18.9	0.04	0.8		0.8	0.73		0.73	3768	3768	0.15	0.03		3781
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		1.11	0.93	8.43	9.25	0.02	0.39		0.39	0.36		0.36	1848	1848	0.07	0.01		1854
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.2	0.17	1.54	1.69	< 0.005	0.07		0.07	0.07		0.07	306	306	0.01	< 0.005		307

Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																							
Daily, Summer (Max)																							
Worker		0.1	0.08	0.07	1.29	0	0	0.01	0.01	0	0	0	218	218	0.01	0.01	0.95	221					
Vendor		0.03	0.01	0.43	0.15	< 0.005	< 0.005		0.01	0.02	< 0.005	< 0.005	0.01	216	216	0.02	0.03	0.54	227				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Daily, Winter (Max)																							
Worker		0.08	0.08	0.09	0.95	0	0	0.01	0.01	0	0	0	193	193	< 0.005	0.01	0.02	196					
Vendor		0.03	0.01	0.46	0.16	< 0.005	< 0.005		0.01	0.02	< 0.005	< 0.005	0.01	216	216	0.02	0.03	0.01	226				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Average Daily																							
Worker		0.04	0.04	0.04	0.48	0	0	0.01	0.01	0	0	0	97.3	97.3	< 0.005	< 0.005	0.2	98.7					
Vendor		0.01	< 0.005	0.22	0.08	< 0.005	< 0.005		0.01	0.01	< 0.005	< 0.005	< 0.005	106	106	0.01	0.02	0.12	111				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Annual																							
Worker		0.01	0.01	0.01	0.09	0	0	< 0.005	< 0.005	0	0	0	16.1	16.1	< 0.005	< 0.005	0.03	16.3					
Vendor	< 0.005	< 0.005		0.04	0.01	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	17.6	17.6	< 0.005	< 0.005	0.02	18.4				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

3.10. Building Construction (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Off-Road Equipment		2.26	1.9	17.2	18.9	0.04	0.8		0.8	0.73		0.73	3768	3768	0.15	0.03		3781
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily, Winter (Max)																		
Off-Road Equipment		2.26	1.9	17.2	18.9	0.04	0.8		0.8	0.73		0.73	3768	3768	0.15	0.03		3781
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		1.11	0.93	8.43	9.25	0.02	0.39		0.39	0.36		0.36	1848	1848	0.07	0.01		1854
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment		0.2	0.17	1.54	1.69	< 0.005	0.07		0.07	0.07		0.07	306	306	0.01	< 0.005		307
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Worker		0.1	0.08	0.07	1.29	0	0	0.01	0.01	0	0	0	218	218	0.01	0.01	0.95	221
Vendor		0.03	0.01	0.43	0.15	< 0.005	< 0.005		0.01	0.02	< 0.005	< 0.005	0.01	216	216	0.02	0.03	0.54	227
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily, Winter (Max)																		
Worker		0.08	0.08	0.09	0.95	0	0	0.01	0.01	0	0	0	193	193	< 0.005	0.01	0.02	196				
Vendor		0.03	0.01	0.46	0.16	< 0.005	< 0.005		0.01	0.02	< 0.005	< 0.005	0.01	216	216	0.02	0.03	0.01	226				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Average Daily																							
Worker		0.04	0.04	0.04	0.48	0	0	0.01	0.01	0	0	0	97.3	97.3	< 0.005	< 0.005	0.2	98.7					
Vendor		0.01	< 0.005	0.22	0.08	< 0.005	< 0.005		0.01	0.01	< 0.005	< 0.005	< 0.005	106	106	0.01	0.02	0.12	111				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Annual																							
Worker		0.01	0.01	0.01	0.09	0	0	< 0.005	< 0.005	0	0	0	16.1	16.1	< 0.005	< 0.005	0.03	16.3					
Vendor	< 0.005	< 0.005		0.04	0.01	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	17.6	17.6	< 0.005	< 0.005	0.02	18.4				
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

3.11. Paving (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		0.92	0.78	6.66	8.27	0.01	0.33		0.33	0.31		0.31	1244	1244	0.05	0.01		1248
Paving			0.42															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.03	0.02	0.18	0.23	< 0.005	0.01		0.01	0.01		0.01	34.1	34.1	< 0.005	< 0.005		34.2
Paving			0.01															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment	< 0.005	< 0.005		0.03	0.04	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	5.64	5.64	< 0.005	< 0.005		5.66
Paving		< 0.005																
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.07	0.06	0.07	0.77	0	0	0.01	0.01	0	0	0	157	157	< 0.005	0.01	0.02	159
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	4.41	4.41	< 0.005	< 0.005	0.01	4.48
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.73	0.73	< 0.005	< 0.005	< 0.005	0.74
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.12. Paving (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		

Daily, Winter (Max)																									
Off-Road Equipment		0.92	0.78	6.66	8.27	0.01	0.33		0.33	0.31		0.31	1244	1244	0.05	0.01		1248							
Paving			0.42																						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Average Daily																									
Off-Road Equipment		0.03	0.02	0.18	0.23	< 0.005	0.01		0.01	0.01		0.01	34.1	34.1	< 0.005	< 0.005		34.2							
Paving			0.01																						
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Annual																									
Off-Road Equipment	< 0.005	< 0.005		0.03	0.04	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	5.64	5.64	< 0.005	< 0.005		5.66							
Paving		< 0.005																							
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Offsite																									
Daily, Summer (Max)																									
Daily, Winter (Max)																									
Worker		0.07	0.06	0.07	0.77	0	0	0.01	0.01	0	0	0	157	157	< 0.005	0.01	0.02	159							
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Average Daily																									
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005		0	0	4.41	4.41	< 0.005	< 0.005	0.01	4.48							
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Annual																									
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005		0	0	0.73	0.73	< 0.005	< 0.005	< 0.005	0.74							
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							

3.13. Architectural Coating (2023) - Unmitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		0.18	0.15	0.93	1.15	< 0.005	0.04		0.04	0.03		0.03	134	134	0.01	< 0.005		134
Architectural Coatings			20															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.01	0.01	0.04	0.05	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	6.22	6.22	< 0.005	< 0.005		6.24
Architectural Coatings			0.93															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment	< 0.005	< 0.005		0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	1.03	1.03	< 0.005	< 0.005		1.03
Architectural Coatings			0.17															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.03	0.03	0.04	0.38	0	0	< 0.005	< 0.005	0	0	0	77.3	77.3	< 0.005	< 0.005	0.01	78.3
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	3.7	3.7	< 0.005	< 0.005	0.01	3.75
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.61	0.61	< 0.005	< 0.005	< 0.005	0.62
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.14. Architectural Coating (2023) - Mitigated

Location	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Onsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Off-Road Equipment		0.18	0.15	0.93	1.15	< 0.005	0.04		0.04	0.03		0.03	134	134	0.01	< 0.005		134
Architectural Coatings			20															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Off-Road Equipment		0.01	0.01	0.04	0.05	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	6.22	6.22	< 0.005	< 0.005		6.24
Architectural Coatings			0.93															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Off-Road Equipment	< 0.005	< 0.005		0.01	0.01	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	1.03	1.03	< 0.005	< 0.005		1.03
Architectural Coatings			0.17															
Onsite truck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Offsite																		
Daily, Summer (Max)																		
Daily, Winter (Max)																		
Worker		0.03	0.03	0.04	0.38	0	0	< 0.005	< 0.005	0	0	0	77.3	77.3	< 0.005	< 0.005	0.01	78.3
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Daily																		
Worker	< 0.005	< 0.005	< 0.005		0.02	0	0	< 0.005	< 0.005	0	0	0	3.7	3.7	< 0.005	< 0.005	0.01	3.75
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																		
Worker	< 0.005	< 0.005	< 0.005	< 0.005		0	0	< 0.005	< 0.005	0	0	0	0.61	0.61	< 0.005	< 0.005	< 0.005	0.62
Vendor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Hauling		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry		0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Daily, Winter (Max)																		
General Light Industry		0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.66	9.66	< 0.005	< 0.005	< 0.005	9.82
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.66	9.66	< 0.005	< 0.005	< 0.005	9.82
Annual																		
General Light Industry	< 0.005	< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.17	1.17	< 0.005	< 0.005	< 0.005	1.18
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	< 0.005	< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.17	1.17	< 0.005	< 0.005	< 0.005	1.18

4.1.2. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry		0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0.01	0.01	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		10.6	10.6	< 0.005	< 0.005	0.04	10.8
Daily, Winter (Max)																		
General Light Industry		0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.66	9.66	< 0.005	< 0.005	< 0.005	9.82
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0.01	< 0.005	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		9.66	9.66	< 0.005	< 0.005	< 0.005	9.82
Annual																		
General Light Industry	< 0.005	< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.17	1.17	< 0.005	< 0.005	< 0.005	1.18
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total	< 0.005	< 0.005	< 0.005		0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005		1.17	1.17	< 0.005	< 0.005	< 0.005	1.18

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													459	459	0.02	< 0.005		460
Other Asphalt Surfaces													0	0	0	0		0
Total													459	459	0.02	< 0.005		460
Daily, Winter (Max)																		
General Light Industry													459	459	0.02	< 0.005		460
Other Asphalt Surfaces													0	0	0	0		0
Total													459	459	0.02	< 0.005		460
Annual																		
General Light Industry													76	76	< 0.005	< 0.005		76.2
Other Asphalt Surfaces													0	0	0	0		0
Total													76	76	< 0.005	< 0.005		76.2

4.2.2. Electricity Emissions By Land Use - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													459	459	0.02	< 0.005		460
Other Asphalt Surfaces													0	0	0	0		0
Total													459	459	0.02	< 0.005		460
Daily, Winter (Max)																		
General Light Industry													459	459	0.02	< 0.005		460
Other Asphalt Surfaces													0	0	0	0		0
Total													459	459	0.02	< 0.005		460
Annual																		
General Light Industry													76	76	< 0.005	< 0.005		76.2
Other Asphalt Surfaces													0	0	0	0		0
Total													76	76	< 0.005	< 0.005		76.2

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		
General Light Industry		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Annual																		
General Light Industry		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Other Asphalt Surfaces		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Daily, Winter (Max)																		

General Light Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Asphalt Surfaces	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual																	
General Light Industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Asphalt Surfaces	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.3. Area Emissions by Source

4.3.2. Unmitigated

Source	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Consumer Products			0.95															
Architectural Coatings			0.09															
Landscape Equipment		0.34	0.31	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	7.87	7.87	< 0.005	< 0.005		7.9
Total		0.34	1.35	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	7.87	7.87	< 0.005	< 0.005		7.9
Daily, Winter (Max)																		
Architectural Coatings			20.1															
Consumer Products			0.95															
Total			21															
Annual																		
Architectural Coatings			0.19															
Consumer Products			0.17															
Landscape Equipment		0.04	0.04	< 0.005		0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	0.89	0.89	< 0.005	< 0.005		0.9
Total		0.04	0.4	< 0.005		0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	0.89	0.89	< 0.005	< 0.005		0.9

4.3.1. Mitigated

Source	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Consumer Products			0.95															
Architectural Coatings			0.09															
Landscape Equipment		0.34	0.31	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	7.87	7.87	< 0.005	< 0.005		7.9
Total		0.34	1.35	0.02	1.91	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	7.87	7.87	< 0.005	< 0.005		7.9
Daily, Winter (Max)																		
Architectural Coatings			20.1															
Consumer Products			0.95															
Total			21															
Annual																		
Architectural Coatings			0.19															
Consumer Products			0.17															
Landscape Equipment		0.04	0.04	< 0.005		0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	0.89	0.89	< 0.005	< 0.005		0.9
Total		0.04	0.4	< 0.005		0.24	< 0.005	< 0.005		< 0.005	< 0.005		< 0.005	0.89	0.89	< 0.005	< 0.005		0.9

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0
Daily, Winter (Max)																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0
Annual																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0

4.4.1. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0
Daily, Winter (Max)																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0
Annual																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0
Daily, Winter (Max)																		
General Light Industry													0	0	0	0	0	0
Other Asphalt Surfaces													0	0	0	0	0	0
Total													0	0	0	0	0	0
Annual																		
General Light Industry													0	0	0	0	0	0

Other Asphalt Surfaces												0	0	0	0	0	0
Total												0	0	0	0	0	0

4.5.1. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Daily, Winter (Max)																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0
Annual																		
General Light Industry												0	0	0	0	0		0
Other Asphalt Surfaces												0	0	0	0	0		0
Total												0	0	0	0	0		0

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.6.2. Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Equipment Type	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.7.2. Mitigated

Equipment Type	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Equipment Type	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Emergency Generator		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Total		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Daily, Winter (Max)																		
Emergency Generator		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Total		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Annual																		
Emergency Generator	< 0.005	< 0.005		0.01	0.01	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	< 0.005	< 0.005		0.01	0.01	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76

4.8.2. Mitigated

Equipment Type	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Emergency Generator		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Total		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Daily, Winter (Max)																		
Emergency Generator		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Total		1.66	1.51	4.22	5.48	0.01	0.22	0.22	0.22	0.22	0.22		772	772	0.03	0.01		775
Annual																		
Emergency Generator	< 0.005	< 0.005		0.01	0.01	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76
Total	< 0.005	< 0.005		0.01	0.01	< 0.005		< 0.005	< 0.005		< 0.005		1.75	1.75	< 0.005	< 0.005		1.76

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Equipment Type	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		

Total
Annual
Total

4.9.2. Mitigated

Equipment Type	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Vegetation	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Species	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Daily, Winter (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		
Annual																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Vegetation	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Land Use	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Total																		
Daily, Winter (Max)																		
Total																		
Annual																		
Total																		

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Species	TOG	ROG	NOx	CO	SO_2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO_2	$NBCO_2$	CO_2T	CH_4	N_2O	R	CO_2e
Daily, Summer (Max)																		
Avoided																		
Subtotal																		
Sequestered																		
Subtotal																		
Removed																		
Subtotal																		

Daily, Winter (Max)
Avoided
Subtotal
Sequestered
Subtotal
Removed
Subtotal

Annual
Avoided
Subtotal
Sequestered
Subtotal
Removed
Subtotal

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Pha:	Phase Description
Demolition	Demolition	1/1/2023	1/14/2023	5	10	
Site Preparation	Site Preparation	1/17/2023	2/4/2023	5	14	
Grading	Grading	2/7/2023	2/14/2023	5	6	
Drilling	Building Construction	2/15/2023	3/31/2023	7	45	
Construction	Building Construction	3/7/2023	11/10/2023	5	179	
Paving	Paving	11/11/2023	11/25/2023	5	10	
Architectural Coating	Architectural Coating	11/28/2023	12/20/2023	5	17	

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Tractors/Loaders/Backhoes	Diesel	Average	3	8	84	0.37
Demolition	Rubber Tired Dozers	Diesel	Average	1	8	367	0.4
Demolition	Concrete/Industrial Saws	Diesel	Average	1	8	33	0.73
Site Preparation	Graders	Diesel	Average	1	8	148	0.41
Site Preparation	Scrapers	Diesel	Average	1	8	423	0.48
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1	7	84	0.37
Grading	Graders	Diesel	Average	1	8	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1	8	367	0.4
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2	7	84	0.37
Drilling	Welders	Diesel	Average	1	8	46	0.45
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1	8	84	0.37
Paving	Pavers	Diesel	Average	1	8	81	0.42
Paving	Paving Equipment	Diesel	Average	1	8	89	0.36
Paving	Rollers	Diesel	Average	2	8	36	0.38
Paving	Cement and Mortar Mixers	Diesel	Average	1	8	10	0.56
Architectural Coating	Air Compressors	Diesel	Average	1	6	37	0.48
Construction	Cranes	Diesel	Average	1	8	367	0.29
Construction	Forklifts	Diesel	Average	5	7	82	0.2
Construction	Generator Sets	Diesel	Average	1	8	14	0.74
Construction	Tractors/Loaders/Backhoes	Diesel	Average	4	7	84	0.37
Construction	Welders	Diesel	Average	1	8	46	0.45
Demolition	Cement and Mortar Mixers	Diesel	Average	1	8	10	0.56
Drilling	Bore/Drill Rigs	Diesel	Average	1	24	83	0.5
Drilling	Off-Highway Trucks	Diesel	Average	4	8	376	0.38
Drilling	Pumps	Diesel	Average	1	8	11	0.74
Drilling	Air Compressors	Diesel	Average	1	6	37	0.48
Construction	Off-Highway Trucks	Diesel	Average	1	4	376	0.38
Construction	Pumps	Diesel	Average	1	6	11	0.74
Construction	Cement and Mortar Mixers	Diesel	Average	1	8	10	0.56

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Tractors/Loaders/Backhoes	Diesel	Average	3	8	84	0.37
Demolition	Rubber Tired Dozers	Diesel	Average	1	8	367	0.4
Demolition	Concrete/Industrial Saws	Diesel	Average	1	8	33	0.73
Site Preparation	Graders	Diesel	Average	1	8	148	0.41
Site Preparation	Scrapers	Diesel	Average	1	8	423	0.48
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1	7	84	0.37
Grading	Graders	Diesel	Average	1	8	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1	8	367	0.4
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2	7	84	0.37
Drilling	Welders	Diesel	Average	1	8	46	0.45
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1	8	84	0.37
Paving	Pavers	Diesel	Average	1	8	81	0.42
Paving	Paving Equipment	Diesel	Average	1	8	89	0.36
Paving	Rollers	Diesel	Average	2	8	36	0.38
Paving	Cement and Mortar Mixers	Diesel	Average	1	8	10	0.56
Architectural Coating	Air Compressors	Diesel	Average	1	6	37	0.48
Construction	Cranes	Diesel	Average	1	8	367	0.29
Construction	Forklifts	Diesel	Average	5	7	82	0.2
Construction	Generator Sets	Diesel	Average	1	8	14	0.74
Construction	Tractors/Loaders/Backhoes	Diesel	Average	4	7	84	0.37
Construction	Welders	Diesel	Average	1	8	46	0.45
Demolition	Cement and Mortar Mixers	Diesel	Average	1	8	10	0.56
Drilling	Bore/Drill Rigs	Diesel	Average	1	24	83	0.5
Drilling	Off-Highway Trucks	Diesel	Average	4	8	376	0.38

Drilling	Pumps	Diesel	Average	1	8	11	0.74
Drilling	Air Compressors	Diesel	Average	1	6	37	0.48
Construction	Off-Highway Trucks	Diesel	Average	1	4	376	0.38
Construction	Pumps	Diesel	Average	1	6	11	0.74
Construction	Cement and Mortar Mixers	Diesel	Average	1	8	10	0.56

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition				
Demolition	Worker	15	14.3	LDA,LDT1,LDT2
Demolition	Vendor		8.8	HHDT,MHDT
Demolition	Hauling	2.5	20	HHDT
Demolition	Onsite truck			HHDT
Site Preparation				
Site Preparation	Worker	7.5	14.3	LDA,LDT1,LDT2
Site Preparation	Vendor		8.8	HHDT,MHDT
Site Preparation	Hauling	35.7	20	HHDT
Site Preparation	Onsite truck			HHDT
Grading				
Grading	Worker	10	14.3	LDA,LDT1,LDT2
Grading	Vendor		8.8	HHDT,MHDT
Grading	Hauling	0	20	HHDT
Grading	Onsite truck			HHDT
Drilling				
Drilling	Worker	18.5	14.3	LDA,LDT1,LDT2
Drilling	Vendor	7.21	8.8	HHDT,MHDT
Drilling	Hauling	0	20	HHDT
Drilling	Onsite truck			HHDT
Paving				
Paving	Worker	15	14.3	LDA,LDT1,LDT2
Paving	Vendor		8.8	HHDT,MHDT
Paving	Hauling	0	20	HHDT
Paving	Onsite truck			HHDT
Architectural Coating				
Architectural Coating	Worker	7.39	14.3	LDA,LDT1,LDT2
Architectural Coating	Vendor		8.8	HHDT,MHDT
Architectural Coating	Hauling	0	20	HHDT
Architectural Coating	Onsite truck			HHDT
Construction				
Construction	Worker	18.5	14.3	LDA,LDT1,LDT2
Construction	Vendor	7.21	8.8	HHDT,MHDT
Construction	Hauling	0	20	HHDT
Construction	Onsite truck			HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition				
Demolition	Worker	15	14.3	LDA,LDT1,LDT2
Demolition	Vendor		8.8	HHDT,MHDT
Demolition	Hauling	2.5	20	HHDT
Demolition	Onsite truck			HHDT
Site Preparation				
Site Preparation	Worker	7.5	14.3	LDA,LDT1,LDT2
Site Preparation	Vendor		8.8	HHDT,MHDT
Site Preparation	Hauling	35.7	20	HHDT
Site Preparation	Onsite truck			HHDT
Grading				
Grading	Worker	10	14.3	LDA,LDT1,LDT2
Grading	Vendor		8.8	HHDT,MHDT
Grading	Hauling	0	20	HHDT
Grading	Onsite truck			HHDT
Drilling				
Drilling	Worker	18.5	14.3	LDA,LDT1,LDT2
Drilling	Vendor	7.21	8.8	HHDT,MHDT
Drilling	Hauling	0	20	HHDT
Drilling	Onsite truck			HHDT
Paving				
Paving	Worker	15	14.3	LDA,LDT1,LDT2
Paving	Vendor		8.8	HHDT,MHDT
Paving	Hauling	0	20	HHDT
Paving	Onsite truck			HHDT
Architectural Coating				
Architectural Coating	Worker	7.39	14.3	LDA,LDT1,LDT2
Architectural Coating	Vendor		8.8	HHDT,MHDT
Architectural Coating	Hauling	0	20	HHDT
Architectural Coating	Onsite truck			HHDT
Construction				
Construction	Worker	18.5	14.3	LDA,LDT1,LDT2
Construction	Vendor	7.21	8.8	HHDT,MHDT
Construction	Hauling	0	20	HHDT
Construction	Onsite truck			HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Are	Non-Residential Interior Area C	Non-Residential Exterior Parking Area Coated (sq ft)	
Architectural Coating	0	0	69105	23035	4140

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubi	Acres Graded (acres)	Material Demolished (Bu	Acres Paved (acres)
Demolition	0	0	0	2100	
Site Preparation		4000	21	0	
Grading			6	0	
Paving	0	0	0	0	1.58

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0	0
Other Asphalt Surfaces	1.58	100

5.8. Construction Electricity Consumption and Emissions Factors

Year	kWh per Year	CO2	CH4	N2O
2023	0	327	0.01	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	1.01	0	0	264	11.7	0	0	3056
Other Asphalt Surfaces	0	0	0	0	0	0	0	0

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	1.01	0	0	264	11.7	0	0	3056
Other Asphalt Surfaces	0	0	0	0	0	0	0	0

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interio	Non-Residential Exterior Area C	Parking Area Coated (sq ft)
0	0	69105	23035	4140

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	537073	312	0.0129	0.0017	0
Other Asphalt Surfaces	0	312	0.0129	0.0017	0

5.11.2. Mitigated

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	537073	312	0.0129	0.0017	0
Other Asphalt Surfaces	0	312	0.0129	0.0017	0

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	0	0
Other Asphalt Surfaces	0	0

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	0	0
Other Asphalt Surfaces	0	0

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Light Industry	0	0
Other Asphalt Surfaces	0	0

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

General Light Industry	0	0
Other Asphalt Surfaces	0	0

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Ra	Service Leak Rate	Times Serviced

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Ra	Service Leak Rate	Times Serviced

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	1	8	40	115	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/\	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/\	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	20.2	annual days of extreme heat
Extreme Precipitation	6	annual days with precipitation above 20 mm
Sea Level Rise	0	meters of inundation depth
Wildfire	0	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. Th

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cel

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack	N/A	N/A	N/A	N/A
Air Quality	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack	N/A	N/A	N/A	N/A

ne four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft
ll. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Air Quality	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	
AQ-Ozone	50.5
AQ-PM	37.6
AQ-DPM	69.9
Drinking Water	16.8
Lead Risk Housing	79
Pesticides	0
Toxic Releases	29.2
Traffic	32.4
Effect Indicators	
CleanUp Sites	87.2
Groundwater	93.8
Haz Waste Facilities/Generators	80.2
Impaired Water Bodies	77.3
Solid Waste	22.1
Sensitive Population	
Asthma	99.5
Cardio-vascular	97.1
Low Birth Weights	76.1
Socioeconomic Factor Indicators	
Education	60.6
Housing	93.6
Linguistic	
Poverty	94.1
Unemployment	95.5

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	
Above Poverty	11.54882587
Employed	2.989862697
Education	
Bachelor's or higher	43.64172976
High school enrollment	0.551777236
Preschool enrollment	67.11151033
Transportation	
Auto Access	6.467342487
Active commuting	37.39253176
Social	
2-parent households	13.17849352
Voting	40.74169126
Neighborhood	
Alcohol availability	30.25792378
Park access	81.35506224
Retail density	79.26344155
Supermarket access	52.34184525
Tree canopy	89.20826383
Housing	
Homeownership	23.32862826
Housing habitability	26.71628384
Low-inc homeowner severe housing cost burden	9.149236494
Low-inc renter severe housing cost burden	31.63095085
Uncrowded housing	51.79006801
Health Outcomes	
Insured adults	22.55870653
Arthritis	4.4
Asthma ER Admissions	1.4
High Blood Pressure	5.4
Cancer (excluding skin)	23
Asthma	8.7
Coronary Heart Disease	3.6
Chronic Obstructive Pulmonary Disease	2.8
Diagnosed Diabetes	14
Life Expectancy at Birth	3
Cognitively Disabled	17
Physically Disabled	3.8
Heart Attack ER Admissions	4
Mental Health Not Good	20
Chronic Kidney Disease	11
Obesity	14
Pedestrian Injuries	97
Physical Health Not Good	15
Stroke	6.5
Health Risk Behaviors	
Binge Drinking	79
Current Smoker	10

No Leisure Time for Physical Activity	31
Climate Change Exposures	
Wildfire Risk	0
SLR Inundation Area	0
Children	72
Elderly	40
English Speaking	28
Foreign-born	36
Outdoor Workers	71
Climate Change Adaptive Capacity	
Impervious Surface Cover	47
Traffic Density	33
Traffic Access	74
Other Indices	
Hardship	86
Other Decision Support	
2016 Voting	22

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	94
Healthy Places Index Score for Project Location (b)	2
Project Located in a Designated Disadvantaged Community (S	Yes
Project Located in a Low-Income Community (Assembly Bill 1	Yes
Project Located in a Community Air Protection Program Comr	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

Measure Title	Co-Benefits Achieved

7.5. Evaluation Scorecard

Category	Number of Applicable Measures	Total Points Earned by A	Max Possible Points	Weighted Score

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	per project description
Construction: Off-Road Equipment	per project description
Operations: Vehicle Data	per project description
Operations: Energy Use	per project description
Operations: Water and Waste Water	per project description
Operations: Solid Waste	per project description
Operations: Refrigerants	not climate controlled

APPENDIX D - BIOLOGICAL RESOURCES TECHNICAL REPORT

BIOLOGICAL RESOURCES TECHNICAL REPORT

CITY OF SACRAMENTO GROUNDWATER MASTER PLAN

SACRAMENTO, SACRAMENTO COUNTY, CALIFORNIA

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WRA #30359
JULY 2020

wra
ENVIRONMENTAL CONSULTANTS

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DEFINITIONS

Study Area: The area throughout which the assessment was performed, inclusive of 38 discrete Well Sites in the City of Sacramento.
Well Site: The area evaluated for potential direct impacts to sensitive biological resources, inclusive of a proposed project footprint and surrounding 100-foot buffer.

LIST OF ACRONYMS

BGEPA	Bald and Golden Eagle Protection Act
BIOS	Biogeographic Information and Observation System
BRTR	Biological Resources Technical Report
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFP	California Fully Protected Species
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
County	County of Sacramento
Corps	U.S. Army Corps of Engineers
CSRL	California Soils Resources Lab
CWA	Clean Water Act
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
GGS	Giant Garter Snake
ITP	Incidental Take Permit
LSAA	Lake or Streambed Alteration Agreement
Magnusen-Stevens Act	Magnuson-Stevens Fishery Conservation & Management
MBTA	Migratory Bird Treaty Act
NBHCP	Natomas Basin Habitat Conservation Plan
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
NWPL	National Wetland Plant List
OHWM	Ordinary High Water Mark
Rank	California Rare Plant Ranks
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
SWHA	Swainson's Hawk
SWRCB	State Water Resource Control Board
TOB	Top of Bank

USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley Elderberry Longhorn Beetle
VPFS	Vernal Pool Fairy Shrimp
VPTS	Vernal Pool Tadpole Shrimp
WBWG	Western Bat Working Group
WRA	WRA, Inc.

1.0 INTRODUCTION

This Biological Resources Technical Report evaluates existing biological resources, potential impacts, and mitigation measures (if required) for the City of Sacramento Groundwater Master Plan Project (Project). WRA, Inc. (WRA) performed a constraints assessment of biological resources on 38 discrete Well Sites located within the City of Sacramento, Sacramento County, California. Well Sites and a surrounding 100-foot buffer, collectively referred to as the Study Area, are all located in Sacramento County, California (Figure 1). The Study Area is a mix of undeveloped vacant land, parks, schools, median strips and industrial areas. Some of the individual Well Sites have some degree of infrastructure development, though most do not. The majority of the Well Sites are within or adjacent to areas of existing commercial and/or residential development. Site assessments were conducted between June 22 and June 26, 2020, to determine site conditions and identify potential constraints to future project activities at the Well Sites with respect to local regulations and ordinances and to identify any potential biological constraints pursuant to the California Environmental Quality Act (CEQA).

This report describes the results of the site visits, which assessed the Study Area for the (1) potential to support special-status species; and (2) presence of other sensitive biological resources protected by local, state, and federal laws and regulations.

1.1 Overview and Purpose

This report provides an assessment of biological resources within the Study Area and immediate vicinity. The assessment did not include a full protocol-level surveys for special-status species, though they were searched for if identifiable. The purpose of the assessment was to develop and gather information on sensitive biological communities and special-status plant and wildlife species to support an evaluation of the Project under CEQA. This report describes the results of the site visit, which assessed the Study Area for (1) the presence of sensitive biological communities, special-status plant species, and special-status wildlife species, (2) the potential for the site to support special-status plant and wildlife species. Based on the results of the site assessment, potential impacts to sensitive biological communities and special-status species resulting from the proposed project were evaluated. If the project has the potential to result in significant impacts to these biological resources, measures to avoid, minimize, or mitigate for those significant impacts are described.

A biological resources technical report provides general information on the presence, or potential presence, of sensitive species and habitats. Additional focused studies (such as protocol-level species surveys or wetland delineation) may be required to support regulatory permit applications or to implement mitigation measures included in this report. This assessment is based on information available at the time of the study and on site conditions that were observed on the dates the Well Sites were visited. Conclusions are based on currently available information used in combination with the professional judgement of the biologists completing this study.

1.2 Project Description

The City of Sacramento Well Replacement Program involves the construction and operation of up to 38 groundwater extraction wells within the City's water service area, which overlies the North American and

South American Subbasins of the Sacramento Valley Groundwater Basin, as well as distribution system improvements and the decommissioning of 38 existing active and inactive municipal wells that are at or near the end of their useful life.

The Well Sites are generally in an urban setting. Surrounding land uses for existing and proposed replacement wells include single-family residential, multi-family residential, schools, commercial, office, public facilities (such as existing well sites, water storage facilities, and water treatment facilities), and open space/park.

1.2.1 Construction Activities

Construction of wells under the Project would take place in four stages:

- Exploratory drilling would involve construction of test holes or monitoring wells to characterize the groundwater conditions at the site.
- Well drilling and construction would involve clearing of a pad for a drill rig followed by drilling operations, which would require drilling 24 hours per day for at least two weeks. Drilling may take longer for deeper wells. Wells would range in depth from about 250 feet to 1,200 feet.
- Well equipping includes the construction of all above-grade facilities as well below grade pipelines to connect the replacement well to the potable water distribution system. The remainder of the site would be cleared and the well and control building would be constructed. The site would be paved, landscaped and fenced. Pipelines to connect to the potable water distribution system would be constructed and each well would be connected to the sewer system for disposal of backwash water. Each well site would be about one acre in size (200 feet by 200 feet).
- Well destruction would entail removal of existing wells. If replacement wells are sited at an existing well facility the existing well would be destroyed in accordance with California Well Standards. If a replacement well is not located at the site of an existing well, well destruction would include removal of all above-ground facilities at the well site, with the exception of fencing, and underground piping would be abandoned in place.

During well drilling and equipping, the contractor would employ a staging area adjacent to the well site to store drilling equipment and materials. Staging areas would typically be in parking lots, lawn areas, or vacant land.

1.3 Summary of Results

In summary, no special-status species of plants or wildlife were observed during the site visits. However, based on a review of available information and an assessment of site conditions, WRA concludes that there is potential for special-status plants and wildlife, regulated habitats (e.g. wetlands and streams) and trees subject to local ordinances to occur within the Study Area, though this potential is restricted to a limited number of the discrete Well Sites. These constraints are described in greater detail in the following sections and are described in the context of the individual Well Sites that may support them. In addition, five of the Well Sites are within the Natomas Basin Habitat Conservation Plan (NBHCP).

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Table 1. Summary of Biological Resources Evaluation

CEQA Assessment Category[1] IV. - Biological Resources	Biological Resources Considered	Relevant Laws and Regulations	Responsible Regulatory Agency	Summary of Findings & Report Section[2]
Question A. Special-status species	Special-status Plants Special-status Wildlife Designated Critical Habitat	Federal Endangered Species Act (ESA), California Endangered Species Act (CESA), California Native Plant Protection Act (CNPPA), Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA)	U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW)	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less-than-significant. See Section 7.1 for more information
Question B. Sensitive natural communities & Riparian habitat	Sensitive Natural Communities Streams, Lakes, & Riparian Habitat	California Fish and Game Code (CFGC), Oak Woodland Conservation Act, Porter-Cologne Water Quality Control Act, Clean Water Act (CWA)	California Department of Fish and Wildlife (CDFW), U.S. Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), State Water Resources Control Board (SWRCB), Regional Water Quality Control Board (RWQCB)	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less-than-significant. **See Section 7.2 for more information**
Question C. State and federally protected wetlands	Wetlands Unvegetated surface waters	Clean Water Act (CWA) Sections 404/401, Rivers and Harbors Act Section 10, Porter-Cologne Water Quality Control Act	U.S. Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), State Water Resources Control Board (SWRCB), Regional Water Quality Control Board (RWQCB)	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less-than-significant. **See Section 7.3 for more information**

[1] *CEQA Questions have been summarized here; see Section 6.2 for details.*
[2] *As given in this report; see Section 5.0 subheadings*

CEQA Assessment Category1IV. -Biological Resources	Biological Resources Considered	Relevant Laws and Regulations	Responsible Regulatory Agency	Summary of Findings & Report Section2
Question D. Fish & wildlife corridors	Essential Fish Habitat, Wildlife Corridors	California Fish and Game Code (CFGC), Magnusen-Stevens Fishery Conservation & Management Act	California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS)	Potentially significant impacts were not identified during this assessment. **See Section 7.4 for more information**
Question E. Local policies	Protected Trees Other biological protections	Local Tree Ordinance, General Plan (e.g., Stream & Wetland Setbacks), Local ordinances	Local and regional agencies	Potentially significant impacts were identified and mitigation measures included that reduce those impacts to a level that is less than significant. **See Section 7.5 for more information**
Question F. Local, state, federal conservation plans	Habitat Conservation Plans, Natural Community Conservation Plans	Federal Endangered Species Act (ESA), Natural Community Conservation Planning Act (NCCPA)	U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW)	Potentially significant impacts were not identified. **See Section 7.6 for more information**

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2.0 REGULATORY BACKGROUND

The following sections explain the regulatory context of the biological resources technical report, including applicable laws and regulations that were applied to the field investigations and analysis of potential project impacts. Table 1 shows the correlation between these regulations and each Biological Resources question in the Environmental Checklist Form (Appendix G) of the CEQA guidelines.

2.1 Federal and State Regulatory Setting

2.1.1 Vegetation and Aquatic Communities

CEQA provides protections for particular vegetation types defined as sensitive by the CDFW, and aquatic communities protected by laws and regulations administered by the EPA, Corps, SWRCB, and RWQCB. The laws and regulations that provide protection for these resources are summarized below.

Sensitive Natural Communities: Sensitive natural communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" (CDFG 2010, CDFW 2018a) and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2020a). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2020) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). In addition, this general class includes oak woodlands that are protected by local ordinances under the Oak Woodlands Protection Act.

Waters of the United States, Including Wetlands: The Corps regulates “Waters of the United States” under Section 404 of the CWA. Waters of the United States are defined in the Code of Federal Regulations (CFR) as including the territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, such as tributaries, lakes and ponds, impoundments of waters of the U.S., and wetlands (33 CFR 328.3). Potential wetland areas, according to the three criteria used to delineate wetlands as defined in the Corps Wetlands Delineation Manual (Environmental Laboratory 1987), are identified by the presence of (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Unvegetated waters including lakes, rivers, and streams may also be subject to Section 404 jurisdiction and are characterized by an ordinary high water mark (OHWM) identified based on field indicators such as the lack of vegetation, sorting of sediments, and other indicators of flowing or standing water. The placement of fill material into Waters of the United States generally requires a permit from the Corps under Section 404 of the CWA.

The Corps also regulates construction in navigable waterways of the U.S. through Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC 403). Section 10 of the RHA requires Corps approval and a permit for excavation or fill, or alteration or modification of the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor or refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States. Section 10 requirements apply only to navigable waters themselves, and are not applicable to tributaries, adjacent wetlands, and similar aquatic features not capable of supporting interstate commerce.

Waters of the State, Including Wetlands: The term "Waters of the State" is defined by the Porter-Cologne Water Quality Control Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." The SWRCB and nine RWQCB districts protect waters within this broad regulatory scope through many different regulatory programs. Waters of the State in the context of a CEQA Biological Resources evaluation include wetlands and other surface waters protected by the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. The SWRCB and RWQCB issue permits for the discharge of fill material into surface waters through the State Water Quality Certification Program, which fulfills requirements of Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require a CWA permit are also required to obtain a Water Quality Certification. If a project does not require a federal permit, but does involve discharge of dredge or fill material into surface waters of the State, the SWRCB and RWQCB may issue a permit in the form of Waste Discharge Requirements.

Sections 1600-1616 of California Fish and Game Code: Streams and lakes, as habitat for fish and wildlife species, are regulated by CDFW under Sections 1600-1616 of CFGC. Alterations to or work within or adjacent to streambeds or lakes generally require a 1602 Lake or Streambed Alteration Agreement (LSAA). The term "stream", which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). The term "stream" can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). Riparian vegetation has been defined as "vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself" (CDFG 1994). Removal of riparian vegetation also requires a Section 1602 LSAA from CDFW.

2.1.2 Special-status Species

Endangered and Threatened Plants, Fish and Wildlife. Specific plant and wildlife species may be designated as threatened or endangered by the ESA, or CESA. Specific protections and permitting mechanisms for these species differ under each of these acts, and a species' designation under one law does not automatically provide protection under the other.

The ESA (16 USC 1531 et seq.) is implemented by the USFWS and the NMFS. The USFWS and NMFS maintain lists of "endangered" and "threatened" plant and wildlife species (referred to as "listed species"). "Proposed" or "candidate" species are those that are being considered for listing, and are not protected until they are formally listed as threatened or endangered. Under the ESA, authorization must be obtained from the USFWS or NMFS prior to take of any listed species. Take under the ESA is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Take under the ESA includes direct injury or mortality to individuals, disruptions in normal behavioral patterns resulting from factors such as noise and visual disturbance, and impacts to habitat for listed species. Actions that may result in "take" of an ESA-listed species may obtain a permit under ESA Section 10, or via the interagency consultation described in ESA Section 7. Federal-listed plant species are only protected when take occurs on federal land.

The ESA also provides for designation of critical habitat, which are specific geographic areas containing physical or biological features "essential to the conservation of the species". Protections afforded to designated critical habitat apply only to actions that are funded, permitted, or carried out by federal agencies. Critical habitat designations do not affect activities by private landowners if there is no other federal agency involvement.

The CESA (CFGC 2050 et seq.) prohibits a "take" of any plant and animal species that the California Fish and Game Commission determines to be an endangered or threatened species in California. CESA regulations include take protection for threatened and endangered plants on private lands, as well as extending this protection to "candidate species" which are proposed for listing as threatened or endangered under CESA. The definition of a "take" under CESA ("hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") only applies to direct impact to individuals, and does not extend to habitat impacts or harassment. CDFW may issue an Incidental Take Permit (ITP) under CESA to authorize take if it is incidental to otherwise lawful activity and if specific criteria are met. Take of these species is also authorized if the geographic area is covered by a Natural Community Conservation Plan (NCCP), as long as the NCCP covers that activity.

Fully Protected Species and Designated Rare Plant Species. This category includes specific plant and wildlife species that are designated in CFGC as protected even if not listed under CESA or the ESA. Fully Protected Species include specific lists of birds, mammals, reptiles, amphibians, and fish designated in CFGC. Fully protected species may not be taken or possessed at any time and, therefore, no licenses or permits may be issued for take of fully protected species, except for necessary scientific research and conservation purposes. The definition of "take" is the same under the California Fish and Game Code and the CESA. By law, CDFW may not issue an Incidental Take Permit (ITP) for Fully Protected Species. Under the California Native Plant Protection Act (NPPA), CDFW has listed 64 "rare" or "endangered" plant species, and prevents "take", with few exceptions, of these species. CDFW may authorize take of species protected by the NPPA through the ITP process, or under a NCCP.

Special Protections for Nesting Birds and Bats. The federal Bald and Golden Eagle Protection Act (BGEPA) provides relatively broad protections to both of North America's eagle species (bald eagle [*Haliaeetus leucocephalus*] and golden eagle [*Aquila chrysaetos*]) that in some regards are similar to those provided by the ESA. In addition to regulations for special-status species, most native birds in the United States, including non-status species, have baseline legal protections under the Migratory Bird Treaty Act (MBTA) of 1918 and CFGC, i.e., sections 3503, 3503.5 and 3513. Under these laws/codes, the intentional harm or collection of adult birds as well as the intentional collection or destruction of active nests, eggs, and young is illegal. For bat species, the Western Bat Working Group (WBWG) designates conservation status for species of bats, and those with a high or medium-high priority are typically given special consideration under CEQA.

Essential Fish Habitat. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) provides for conservation and management of fishery resources in the U.S., administered by NMFS. This Act establishes a national program intended to prevent overfishing, rebuild overfished stocks, ensure conservation, and facilitate long-term protection through the establishment of Essential Fish Habitat (EFH). EFH consists of aquatic areas that contain habitat essential to the long-term survival and health of fisheries, which may include the water column, certain bottom types, vegetation (e.g. eelgrass (*Zostera* spp.)), or complex structures such as oyster beds. Any federal agency that authorizes, funds, or undertakes action that may adversely affect EFH is required to consult with NMFS.

Species of Special Concern, Movement Corridors, and Other Special Status Species under CEQA. To address additional species protections afforded under CEQA, CDFW has developed a list of special species as "a general term that refers to all of the taxa the CNDDB is interested in tracking, regardless of their legal or protection status." This list includes species lists developed by other organizations, including for example, the Audubon Watch List Species, the Bureau of Land Management Sensitive Species, and USFWS Birds of Special Concern. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (Inventory) with California Rare Plant Ranks (Rank) of 1, 2, and 3 are also considered special-status plant species and must be considered under CEQA. Rank 4 species are typically only afforded protection under CEQA when such species are particularly unique to the locale (e.g., range limit, low abundance/low frequency, limited habitat) or are otherwise considered locally rare. Additionally, any species listed as sensitive within the NBHCP, or other local plans, policies and ordinances are likewise considered sensitive in the HCP area. Movement and migratory corridors for native wildlife (including aquatic corridors) as well as wildlife nursery sites are given special consideration under CEQA.

2.2 Local Regulatory Setting

City of Sacramento 2035 General Plan

The City of Sacramento's 2035 General Plan (General Plan; City of Sacramento 2015a) was written to serve as a guide for future development and growth in the City of Sacramento. Included in the General Plan is guidance pertaining to environmental resources, including "riparian habitat," "annual grasslands," and "wetland protection." Relevant General Plan language is as follows:

ER 2.1.6 Wetland Protection. The City shall preserve and protect wetland resources including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands, to the extent feasible. If not feasible, the mitigation of all adverse impacts on wetland resources shall be required in compliance with State and Federal regulations protecting wetland resources, and if applicable, threatened or endangered species. Additionally, the City shall require either on- or off-site permanent preservation of an equivalent amount of wetland habitat to ensure no net-loss of value and/or function.

Applicable Habitat Conservation Plans (HCPs)

Natomas Basin Habitat Conservation Plan

The NBHCP (City of Sacramento et al. 2003) was developed to promote biological conservation together with in conjunction with economic and urban development within the Natomas Basin, which is located in northern Sacramento County and southern Sutter County. The NBHCP establishes a multi-species conservation program designed to allow for continued development within the Natomas Basin while mitigating the anticipated impacts to habitats and the incidental take of protected species resulting from development. Projects located within the NBHCP Area may obtain permits and mitigation coverage through payment of in-lieu fees to the NBHCP. Projects receiving permits through the NBHCP must also implement avoidance and minimization measures included in the NBHCP to reduce the potential for take of covered species. These measures are outlined in Chapter 5 of the NBHCP. Measures include a pre-construction survey between 30 days and 6 months (or prior year for species with seasonal survey windows) prior to initiation of construction activities and additional species-specific conservation measures.

The Study Area is partially located within the NBHCP Area. The five Well Sites that are located within the NBHCP area are: Well 15, Well 19, Well 20, Well 23, and Well 39.

City of Sacramento Tree Ordinance. The City of Sacramento Tree Ordinance requires approval for the regulated work to City Trees for public projects (Section 12.56.040). Regulated work includes planting, removal, or work which may adversely impact the health of trees on City property. The Ordinance defines a "City Tree" as:

> Any tree the trunk of which, when measured at 4.5 feet above ground is partially or completely located in a city park, or on real property the city owns…"

If a public project may potentially remove City Trees, and avoidance is not feasible, the city project manager shall provide written justification to the director of the need to remove City Trees for the public project. City Trees that have a diameter at standard height (DSH) of 4 inches or more require approval of the director. If the DSH is less than 4 inches, the tree shall be removed as provided in Section 12.56.030. C.

3.0 ASSESSMENT METHODOLOGY

On June 22 through June 24, 2020, WRA biologists visited the Study Area to map vegetation, aquatic communities, unvegetated land cover types, document plant and wildlife species present, and evaluate habitat on site for the potential to support special status species as defined by the CEQA. Prior to the site visit, WRA biologists reviewed literature resources and performed database searches to assess the potential for sensitive biological communities (e.g., wetlands) and special-status species (e.g., endangered plants), including:

- Soil Survey of Sacramento County, California (USDA 1993)
- Sacramento East and Rio Linda 7.5-minute quadrangle (USGS 2018)
- Contemporary aerial photographs (Google Earth 2020)
- Historical aerial photographs (Historical Aerials 2020)
- National Wetlands Inventory (USFWS 2020a)
- California Aquatic Resources Inventory (SFEI 2020)
- California Natural Diversity Database (CNDDB, CDFW 2020a)
- California Native Plant Society Electronic Inventory (CNPS 2020a)
- Consortium of California Herbaria (CCH 2020)
- USFWS List of Federal Endangered and Threatened Species (USFWS 2020b)
- eBird Online Database (eBird 2020)
- CDFW Publication, California Bird Species of Special Concern in California (Shuford and Gardali 2008)
- CDFW and University of California Press publication California Amphibian and Reptile Species of Special Concern (Thomson et al. 2016)
- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)
- A Manual of California Vegetation, 2nd Edition (Sawyer et al. 2009)
- A Manual of California Vegetation Online (CNPS 2020b)
- Preliminary Descriptions of the Terrestrial Natural Communities (Holland 1986)
- California Natural Community List (CDFW 2018a)

- Natomas Basin Habitat Conservation Plan (City of Sacramento 2003)

Database searches (i.e., CNDDB, CNPS) focused on the geographic extent of the Study Area and the surrounding five miles for special-status plants and wildlife. Figures 2 and 3 in Appendix A contains occurrences of special-status species documented within a five-mile radius of the Study Area.

Following the remote assessment, WRA biologists completed a field review over the course of three days to document: (1) land cover types (e.g., vegetation communities, aquatic resources), (2) potential for the Study Area to provide suitable habitat for any special-status plant or wildlife species, (3) potential for the Study Area to support wetlands, and other potential constraints such as trees subject to local ordinances and (4) to document special-status species if detectable and present[3].

3.1 Vegetation Communities and Other Land Cover Types

During the site visit, WRA evaluated the species composition and area occupied by distinct vegetation communities, aquatic communities, and other land cover types. Sensitive land cover types were mapped at a coarse level. Mapping of these classifications utilized a combination of aerial imagery and field surveys. In most instances, communities are characterized based on distinct shifts in plant assemblage (vegetation), and follow the California Natural Community List (CDFW 2018b), *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and *A Manual of California Vegetation, Online Edition* (CNPS 2020b). These vegetation manuals do not describe every potential vegetation assemblage in California, and so in some cases, it is necessary to identify other appropriate vegetative classifications based on best professional judgment of WRA biologists. When undescribed variants are used, it is noted in the description. Vegetation alliances (natural communities) with a CDFW Rank of 1 through 3 ((globally critically imperiled (S1/G1), imperiled (S2/G2), or vulnerable (S3/G3)), were evaluated as sensitive as part of this evaluation.

The Study Area was assessed for the potential presence of wetlands and other aquatic resources based on the methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* ("Arid West Supplement"; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Areas meeting these indicators were mapped at an assessment level as aquatic resources and categorized using the vegetation community classification methods described above where possible. Aquatic communities which are mapped in the NMFS Essential Fish Habitat Mapper (NMFS 2020), or otherwise meet criteria for designation as Essential Fish Habitat are indicated as such in the community description below in Section 5.1. The presence of riparian habitat was evaluated based on woody plant species meeting the definition of riparian provided in *A Field Guide to Lake and Streambed Alteration Agreements, Section 1600-1607, California Fish and Game Code* (CDFG 1994) and based on best professional judgement of biologists completing the field surveys.

[3] Due to the timing of the assessment, it may or may not constitute protocol-level species surveys; see Section 4.2 if the site assessment would constitute a formal or protocol-level species survey.

3.2 Special-status Species

3.2.1 General Assessment

Potential occurrence of special-status species in the Study Area was evaluated by first determining which special-status species occur in the vicinity of the Study Area through a literature and database review as described above. Presence of suitable habitat for special-status species was evaluated during the site visit(s) based on physical and biological conditions of the site, as well as the professional expertise of the investigating biologists. The potential for each special-status species to occur in the Study Area was then determined according to the following criteria:

- No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

- Unlikely. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

- Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

- High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

- Present. Species is observed on the site or has been recorded (i.e. CNDDB, other reports) on the site in the recent past.

If a more thorough assessment was deemed necessary, a targeted or protocol-level assessment may be recommended as a future study. If a special-status species was observed during the site visit, its presence was recorded and discussed below in Section 5.2. If designated critical habitat is present for a species, the extent of critical habitat present and an evaluation of critical habitat elements is provided as part of the species discussions below.

3.2.2 Special-status Plants

A general assessment for special-status plants was conducted within the Study Area June 22 through 24, 2020. The survey assessed the habitat within the Study Area to determine if any special-status plants have the potential to occur.

To determine the presence or absence of special-status plant species determined to have potential and that were identifiable in the month of June, those species were searched for during the assessment site visits June 22 through June 24, 2020. The field surveys were conducted by botanists familiar with the flora of Sacramento and surrounding counties.

3.2.3 Special-status Wildlife

The study evaluated the likelihood for each special-status species wildlife species to be present in Study Area based on the suitability of habitat observed (Appendix C). No special field studies (e.g. protocol level) were conducted as part of this study. As such, any conclusions reached as to presence and absence of a special status species may be subject to modification should new information become available.

To the extent possible, the study also evaluated an approximately 200-foot to 0.5-mile area surrounding the Study Area, depending on the species, in order to comply with applicable NBHCP requirements. Where NBHCP requirements are not applicable, evaluations were limited to the Study Area, as previously described.

3.3 Wildlife Corridors and Native Wildlife Nursery Sites

To account for potential impacts to wildlife movement/migratory corridors, biologists reviewed maps from the California Essential Connectivity Project (CalTrans 2010), and habitat connectivity data available through the CDFW Biogeographic Information and Observation System (BIOS). Additionally, aerial imagery (Google 2018) for the local area was referenced to assess if local core habitat areas were present within, or connected to the Study Area. This assessment was refined based on observations of on-site physical and/or biological conditions, including topographic and vegetative factors that can facilitate wildlife movement, as well as on-site and off-site barriers to connectivity.

The potential presence of native wildlife nursery sites is evaluated as part of the site visit and discussion of individual wildlife species below. Examples of native wildlife nursery sites include nesting sites for native bird species (particularly colonial nesting sites), marine mammal pupping sites, and colonial roosting sites for other species (such as for monarch butterfly).

4.0 ECOLOGICAL SETTING

The Study Area includes 38 discrete areas located throughout the City of Sacramento. These areas are generally located east of Interstate 5/Highway 70, west of Watt Avenue, south of West Elkhorn Boulevard, and north of Cosumnes River Boulevard. The Study Area includes all areas affected by the Project, as well as a 100-foot buffer, excluding some lateral subsurface pipes. Additional details of the local setting are below.

4.1 Soils and Topography

The overall topography of the Study Area is flat with elevations ranging from approximately 30 to 60 feet above sea level. According to the *Soil Survey of Sacramento County* (USDA 1993; CSRL 2020), the Study Area is underlain by 26 soil mapping units; Table 2 below lists each soil mapping unit and indicates the Study Area which contains that soil unit. The parent soil series of all the Study Area's mapping units are summarized below.

Table 2. Soil Mapping Units within the Study Area

Soil Mapping Unit	Well Site
Bruella sandy loam, 0 to 2 percent slopes	22, 32
Clear Lake clay, hardpan substratum, drained, 0 to 1 percent slopes	19, 20
Columbia sandy loam, drained, 0 to 2 percent slopes	24
Cosumnes silt loam, drained, 0 to 2 percent slopes	23
Cosumnes silt loam, partially drained, 0 to 2 percent slopes	15, 39
Cosumnes-Urban land complex, partially drained, 0 to 2 percent slopes	15
Durixeralfs, 0 to 1 percent slopes	13
Egbert clay, partially drained, 0 to 2 percent slopes	2
Galt clay, 0 to 2 percent slopes	14
Galt-Urban land complex, 0 to 2 percent slopes	1
Madera loam, 0 to 2 percent slopes	12, 37
Madera-Galt complex, 0 to 2 percent slopes	11
Pits	7, 35
Riverwash	5
Rossmoor-Urban land complex, 0 to 2 percent slopes	5, 6, 38
San Joaquin fine sandy loam, 0 to 3 percent slopes	17, 22, 26, 28
San Joaquin silt loam, 0 to 3 percent slopes	3, 37
San Joaquin silt loam, leveled, 0 to 1 percent slope	37
San Joaquin-Durixeralfs complex, 0 to 1 percent slopes	9
San Joaquin-Galt complex, leveled, 0 to 1 percent slopes	14
San Joaquin-Urban land complex, 0 to 2 percent slope	1, 2, 3, 4, 8, 16, 33, 35
San Joaquin-Urban land complex, 0 to 3 percent slopes	10, 21, 26, 27, 29, 30, 31
Urban land	24, 25, 31, 34
Water	39
Xerarents-San Joaquin complex, 0 to 1 percent slopes	9, 17, 36
Xerarents-Urban land-San Joaquin complex, 0 to 5 percent slopes	8

4.2 Climate and Hydrology

The Study Area is located in the southern portion of the Sacramento Valley. The average monthly maximum temperature in the area is 73 degrees Fahrenheit, while the average monthly minimum temperature is 49 degrees Fahrenheit. Predominantly, precipitation falls as rainfall between November and March with an annual average precipitation of 18 inches (WRCC 2020).

Regional watersheds within the Study Area include Cache Slough-Sacramento River (HUC 8: 180-20-163), Lower American River (HUC 8: 180-20-111), and Auburn Ravine-Coon Creek (HUC 8: 180-20-161). Several blue-line streams are present within or immediately adjacent to the Study Area (USGS 2018). Several mapped resources in the National Wetlands Inventory (NWI; USFWS 2020a), and California Aquatic Resources Inventory (CARI; SFEI 2020) are situated in the Study Area. Detailed descriptions of aquatic resources are provided in Section 5.1 below.

4.3 Land-use

The majority of the Study Area is landscaped or maintained vegetation of City parks or schools and/or developed with City infrastructure. Undeveloped areas consist of ruderal vegetation or non-native grassland in un-developed City lots. Detailed plant community descriptions are included in Section 5.1 below, and all observed plants are included in Appendix B. Surrounding land uses include residential and industrial (Google Earth 2020). Historically, the Study Area was developed for agriculture (Historic Aerials 2020).

5.0 ASSESSMENT RESULTS

5.1 Vegetation Communities and Other Land Cover

WRA observed seven land cover types within the Study Area: developed, landscaped, non-native grassland, seasonal wetlands, drainage canals, ditch, and artificial pond. Sensitive land cover types within the Study Area are illustrated in Figure 4 (Appendix A). The non-sensitive land cover types in the Study Area include non-native grasslands, landscaped and developed areas, and artificial pond, while the sensitive communities include the streams (drainage canals and ditches) and seasonal wetlands.

Table 3. Sensitive Land Cover Types

COMMUNITY/LAND COVERS	SENSITIVE STATUS	RARITY RANKING	WELL SITES WITH SENSITIVE LAND COVER TYPES
Aquatic Resources			
Seasonal wetland	Sensitive	N/A	2, 13, 12, 28, 29, 30, 37
Drainage Canal	Sensitive	N/A	24, 30, 39
Ditch	Sensitive	N/A	2, 28

5.1.1 Terrestrial Land Cover

Developed Area (no vegetation alliance). CDFW Rank: None. Developed areas include areas which are paved or have structures. If planted trees are immediately adjacent to the paved areas, these are included within developed areas. Developed areas include parking lots, access roads and structures within the Study Area. Vegetation in developed areas includes planted native and non-native trees. Generally the trees are young and small with little to somewhat developed canopy.

Landscaped Area (no vegetation alliance). CDFW Rank: None. Landscape areas include areas which are dominated by vegetation which is regularly maintained. Landscaped areas include City parks, fields at City schools, and vegetated median strips within City roads. Vegetation within the landscaped areas include mowed fields of turf grasses dominated by Bermuda grass (*Cynodon dactylon*), dallis grass (*Paspalum dilatatum*), and bluegrass (*Poa* spp.). Associated species include white clover (*Trifolium repens*), ribwort (*Plantago lanceolata*), common plantain (*Plantago major*), and common purslane (*Portulaca oleracea*). Landscaped areas also include planted and/or natural stands of native and non-native trees. Native trees observed included valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), California sycamore (*Platanus racemosa*), and interior live oak (*Quercus wislizenii*). The trees ranged from saplings to mature. Non-native trees observed in landscaped areas included but are not limited to black locust (*Robinia pseudoacacia*), crape myrtle (*Lagerstroemia indica*), Chinese pistache (*Pistacia chinensis*), and London plane (*Platanus* x *racemosa*).

Non-native grassland (Wild Oats Grassland-*Avena* spp. Herbaceous Semi-Natural Alliance). CDFW Rank: None. Non-native grasslands are present within many of the Well Sites, occurring in undeveloped and unmaintained locations. These non-native grasslands vary in species composition, but are commonly dominated by slim oat (*Avena barbata*) and generally best fit the Wild Oats Grassland Alliance (CNPS 2020b). The vegetation is dominated by slim oat and other non-native grasses, including Bermuda grass, ripgut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), and downy chess (*Bromus tectorum*). Associated species include wild lettuce (*Lactuca saligna*), filaree (*Erodium* spp.), field bindweed (*Convolvulus arvensis*), short-podded mustard (*Hirschfeldia incana*), cheese weed (*Malva parviflora*), and

willow herb (*Epilobium brachycarpum*). Many of these areas were mowed or disked prior to the field work, which is likely an annual or biannual occurrence.

5.1.2 Aquatic Resources

Seasonal Wetland (Perennial ryegrass fields-*Festuca perennis* Herbaceous Semi-Natural Alliance; Creeping ryegrass turf-*Elymus triticoides* Herbaceous Alliance). CDFW Rank: Italian ryegrass fields: No Rank; Creeping ryegrass turf: G3 S3. Seasonal wetlands occur in areas where the soil is saturated for a duration sufficient to support hydrophytic vegetation; saturated conditions are generally absent during the dry season. Several potential seasonal wetlands are present within the Study Area; most seasonal wetlands within the Study Area best fit the Perennial Ryegrass Field alliance. One location (Well 28) also contains a seasonal wetland which best fits the Creeping Ryegrass Turf alliance. Within the Study Area, seasonal wetlands occur in depressions on areas of compacted soil or in ditches which show no indications of flow. Typical vegetation within the perennial ryegrass wetlands includes Italian ryegrass, barley (*Hordeum marinum*), hood canary grass (*Phalaris paradoxa*), smartweed (*Persicaria* sp.), tall cyperus (*Cyperus eragrostis*), hyssop loosetrife (*Lythrum hyssopifolia*), toad rush (*Juncus bufonius*), curly dock (*Rumex crispus*), and bristly ox-tongue (*Helminthotheca echioides*). The creeping ryegrass wetland is dominated by creeping ryegrass. Indicators of hydric soils and wetland hydrology were observed in areas mapped as seasonal wetland. Section 7 provides an analysis of impacts and mitigation measures for these sensitive features.

Drainage canal (no vegetation alliance). CDFW Rank: None. Several sites (24, 30, and 39) are located within 100-feet of drainage canal. Drainage canals within the Study Area are man-made channels with earthen or concrete bottoms which appear to be re-routed channels. These features contain an obvious bed and bank and contain indicators of OHWM. Drainage canals observed in the Study Area ranged between 10 and 30-feet wide between top-of-bank (TOB), and the beds ranged between 4 and 10 feet wide between OHWMs. No or very little herbaceous vegetation is present within the TOB of the concrete-lined canals. Vegetation within the TOB of drainage canals with earthen bottoms was generally herbaceous and occasionally mowed. Generally, a narrow band of stream-fringe vegetation is present along the OHWM within the TOB, dominated by hydrophytic species such as tall nutsedge, western goldenrod (*Euthamia occidentalis*), and Italian ryegrass; above the OHWM, vegetation is dominated by ruderal species, including milk thistle (*Silybum marinum*), ripgut brome, yellow star thistle (*Centaurea solstitialis*), and filaree. Patches of water primrose (*Ludwigia* sp.) and mosquito fern (*Azolla* sp.) occur as floating vegetation in some of the features. Woody shrubs and trees if present, appeared to be planted ornamental or native trees. Section 7 provides an analysis of impacts and mitigation measures for these sensitive features.

Ditch (no vegetation alliance). CDFW Rank: None. Ephemeral ditches are located in the Study Area at Well Sites 2 and 28. These features capture surface flow and convey the water to a larger nearby conveyance. The ditch is vegetated and no indication of flow was observed. The TOB of the features was approximately 5-6 feet wide while the OHWM is approximately 2-3 feet wide. Hydrophytic vegetation, dominated by Italian ryegrass is present within the OHWM. Weedy upland species are present above the OHW line to the TOB. Section 7 provides an analysis of impacts and mitigation measures for these sensitive features.

Pond (no vegetation alliance). CDFW Rank: None. An artificially created ornamental pond is present at one site (Well 35). The TOB of the pond is dominated by non-native grassland and planted trees, which are maintained. A small patch of cattail (*Typha* sp.) is present within the pond in the Study Area. This

feature was absent in 1966 aerial imagery (Historic Aerials 2020) and is not currently mapped by USFWS nor CARI (NWI 2020; SFEI 2020) and is not considered a sensitive resource.

5.2 Special-status Species

5.2.1 Special-status Plants

Based upon a review of the resource databases listed in Section 4.0, including the NBHCP, 23 special-status plant species have been documented in the vicinity of the Study Area. Seven of these plants have the potential to occur in the Study Area. The remaining species documented from the greater vicinity are unlikely or have no potential to occur for one or more of the following:

- Hydrologic conditions (e.g., perennial wetlands, vernal pools) necessary to support the special-status plant species are not present in the Study Area;
- Edaphic (soil) conditions (e.g., alkaline soils) necessary to support the special-status plant species are not present in the Study Area;
- Associated natural communities (e.g., perennial marsh, vernal pool) necessary to support the special-status plant species are not present in the Study Area;
- The Study Area is geographically isolated by surrounding development from the documented range of the special-status plant species;
- The historical landscape and/or habitat(s) of the Study Area were not suitable habitat prior to land/type conversion to support the special-status plant species;
- Land use history and contemporary management (e.g., grading, mowing, pesticide use) has degraded the localized habitat necessary to support the special-status plant species.

WRA biologists conducted assessment level surveys during a period sufficient to identify two of the seven special-status plant species with the potential to occur: pappose tarplant (*Centromadia parryi* ssp. *parryi*) and Pary's rough tarplant (*Centromadia parryi* ssp. *rudis*). These two species have peak blooming periods within the month of June and would be identifiable if present. No special-status species were observed during the June site visit. The remaining species with potential habitat in the Study Area are summarized below.

Table 4. Potential Special-status Plants

Scientific Name	Common Name	Conservation Status	Well Sites with Habitat on or Nearby
Formally Listed Plants (FESA, CESA, CNPPA)			
No formally listed plants have the potential to occur			
Other Special-status Plants (CEQA, other)			
Brodiaea rosea ssp. *vallicola*	valley brodiaea	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Downingia pusilla	Dwarf downingia	Rank 2B	12, 37

Scientific Name	Common Name	Conservation Status	Well Sites with habitat on or nearby
Fritillaria agrestis	stinkbells	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Navarretia eriocephala	hoary navarretia	Rank 4	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32
Trifolium hydrophilum	saline clover	Rank 1B	7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32

Valley brodiaea (*Brodiaea rosea* ssp. *vallicola*). Rank 4. Moderate Potential. Valley brodiaea is a bulbiferous perennial forb in the brodiaea family (Themidaceae) that blooms from April through May. It typically occurs in swales in valley and foothill grassland and vernal pools in the eastern portion of the Sacramento valley at elevations ranging from 5 to 245 feet (CNPS 2020a). Known associated species include medusa head (*Elymus caput-medusea*), soft chess (*Bromus hordeaceus*), rattail grass (*Festuca myuros*), hawkbit (*Leontodon saxatilis*), rose clover (*Trifolium hirtum*), big heron bill (*Erodium botrys*), Italian ryegrass (*Festuca perennis*), and tarplant (*Holocarpha virgata*) (CCH 2020). This species has the potential to occur in non-native grasslands present within the Study Area.

Dwarf downingia (*Downingia pusilla*), Rank 2B.2. Moderate Potential. Dwarf downingia is annual forb in the harebell family (Campanulaceae) that blooms from March to May. It typically occurs on slightly acidic clay to clay loam mesic areas on the edge of vernal pools and lakes in valley and foothill grassland at elevations ranging from 3 to 1450 feet (CNPS 2020a). This species is an obligate (OBL) wetland plant (Lichvar et al. 2016), and is regularly known from vernal pool habitat, but may occur in other wetland habitat types. Known associated species include maroon spot calico flower (*Downingia concolor*), California goldfields (*Lasthenia californica*), California oat grass (*Danthonia californica*), semaphore grass (*Pleuropogon californicus*), annual hairgrass (*Deschampsia danthonioides*), barleys (*Hordeum* spp.), Italian ryegrass, rattlesnake grasses and docks (*Rumex crispus, R. pulcher*) (CDFW 2020a). This species has a moderate potential to occur in depressional seasonal wetlands observed at Well Sites 12, and 37 due to the presence of associated species and enclosed depressional wetlands.

Stinkbells (*Fritillaria agrestis*). Rank 4. Moderate Potential. Stinkbell is a bulbiferous perennial forb in the lily family (Liliaceae) that blooms from March to June. It typically occurs on clay soils, sometimes derived from serpentine, in grassy areas, occasionally near vernal pools, within cismontane woodland, chaparral, pinyon and juniper woodland, and valley and foothill grassland habitat at elevations ranging from 30 to 5055 feet (CNPS 2020a). This species is a facultative (FAC) plant (Lichvar 2016), but has no vernal pool indicator status (Keeler-Wolf et al. 1998). Known associated species include ripgut brome, soft chess, Italian rye grass, and fillarees (CCH 2020). This species has the potential to occur in non-native grassland present within the Study Area.

Hoary navarretia (*Navarretia eriocephala*). Rank 4. Moderate Potential. Hoary navarretia is an annual herb in the phlox family (Polemoniaceae) that blooms from May to June. It typically occurs in vernally mesic cismontane woodland and valley and foothill grassland at elevations ranging from 340 to 1,310 feet (CNPS 2016a). This species is a facultative wetland plant (Lichvar et al. 2016) and is a vernal pool generalist (Keeler-Wolf et al. 1998). Known associated species include blue oak, manzanitas (*Arctostaphylos* spp.), oats (*Avena* spp.), Italian ryegrass, bromes (*Bromus* spp.), filarees, adobe navarretia (*Navarretia nigelliformis*), marigold navarretia (*N. tagetina*), June grass (*Koeleria macrantha*), and yellow starthistle (CCH 2020). This species has the potential to occur in non-native grassland present within the Study Area.

Saline clover (*Trifolium hydrophilum*). Rank 1B. Moderate Potential. Saline clover is an annual herb in the pea family (Fabaceae) that blooms from April to June. It typically occurs in mesic, alkali sites in marsh, swamp, valley and foothill grassland, and vernal pool habitat at elevations ranging from 0 to 980 feet (0 to 300 meters) (CDFW 2020a, CNPS 2020a). This species is a facultative plant (Lichvar et al. 2016). Known associated species include semaphore grass (*Pleuropogon californicus*), salt grass (*Distichlis spicata*), Italian rye grass, brass buttons (*Cotula coronopifolia*), calico flowers (*Downingia* spp.), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), hyssop loosestrife, toad rush, California oat grass (*Danthonia californica*), purslane speedwell (*Veronica peregrina* ssp. *xalapensis*), meadow barley (*Hordeum brachyantherum*), clovers (*Trifolium microdon*, *T. wormskioldii*, *T. fucatum*), and sand spurry (*Spergularia macrotheca*) (CDFW 2020a). This species has potential to occur in seasonal wetlands within the Study Area.

5.2.2 Special-status Wildlife

No Critical Habitat, EFH or Wildlife Corridors were identified as occurring in the Study Area during this assessment. Potentially suitable habitat for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) exists on two Well Sites. Potential habitat for vernal pool fairy shrimp is present on Well Sites containing wetlands and ditches. All of the Well Sites have potential to support one or more species of nesting bird. Swainson's hawk has potential to nest in the Study Area and its vicinity, as do burrowing owls. Well Sites have potential to support day roosting bats where trees are present, however trees in the Well Sites are not large enough to support maternity roosts for bats. No buildings or trees that would support maternity roosts would be removed or demolished as part of the Project.

Of the special-status wildlife species documented in the vicinity of the Study Area, most are excluded from the majority of the Study Area based on a lack of habitat features and the position of the Study Area in an urban environment that precludes access to the majority of the individual Well Sites. Features not found within the Study Area that are required to support special-status wildlife species include:

- Suitable perennial aquatic habitat (e.g. streams, rivers or ponds) with suitable surrounding upland habitat (e.g. areas with animal burrows)
- Tidal Marsh areas
- Caves, mine shafts, or abandoned buildings
- Extensive grasslands
- Cut banks, riparian jungles, extensive emergent vegetation etc. to support nesting

The absence of such habitat features eliminates components critical to the survival or movement of most special-status species found in the vicinity. For instance, giant garter snake (*Thamnophis gigas*) is documented to historically occur in the vicinity of several parts of the Study Area. However, suitable aquatic habitat and movement corridors connecting the Study Area to source populations are absent, precluding this species from existing on the Study Area.

Six special-status species have potential to occur in the immediate vicinity of or in portions of the Study Area: Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*), vernal pool fairy shrimp (VPFS; *Branchinecta lynchi*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus),* burrowing owl (*Athene cunicularia*), and Swainson's hawk (SWHA; *Buteo swainsonii*).

Native birds protected under the MBTA and CFGC may nest within the Study Area during nesting season (February 1 – August 31). Additionally, Swainson's hawk and burrowing owl are unlikely to nest within the majority of the Study Area, but may nest within 0.25 mile of the Study Area and a few sites may support nesting. Species not documented in the close vicinity of the Study Area and determined to be unlikely or have no potential to occur there are not discussed further, except as required by the NBHCP. Species and habitats evaluated in or immediately outside of the Study Area or species that have not been documented in the close vicinity of the Study Area but require discussion by the NBHCP are discussed below.

Table 5. Potential Special-status Wildlife

Scientific Name	Common Name	Conservation Status	Well Sites with Habitat on or Nearby
Formally Listed Wildlife (FESA, CESA)			
Branchinecta lynchi	vernal pool fairy shrimp	FT	Well Sites 2, 12, 13, 28, 29, 30, 37 have potential wetlands or other features onsite that may be suitable for VPFS.
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	FT	Well Sites 38 and 24 have *Sambucus*, the host plant for VELB.
Buteo swainsonii	Swainson's Hawk	ST	Suitable habitat is present within some sites and is located within 0.25 miles of all sites.
Other Special-status Wildlife (CEQA, other)			
Athene cunicularia	burrowing owl	SSC	This species has numerous documented occurrences in the vicinity of the Study Area and some sites contain burrows.
Lanius ludovicianus	loggerhead shrike	SSC	This species has been documented in the vicinity of the Study Area and may nest there.
Elanus leucurus	white-tailed kite	CFP	This species has been documented in the vicinity and may nest in trees and shrubs if they are available.

Vernal pool fairy shrimp (*Branchinecta lynchi*), Federal Threatened Species. No Potential/ Unlikely in Most Well Sites. Moderate Potential at Well Sites 2, 12, 13, 28, 29, 30 and 37. The vernal pool fairy shrimp is widespread but not abundant; populations are known from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County (additional disjunct populations exist at various locations throughout state). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear sandstone rock pools to large, turbid, alkaline, grassland valley floor pools.

Within the Study Area, Well Sites 2, 12, 13, 28, 29, 30, 37 have potential to support VPFS. While most of these sites do not have connectivity to documented occurrences of the species, their presence cannot be ruled out without additional study.

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*), Federal Threatened Species. Unlikely or No Potential at most Well Sites. Moderate Potential in Well Sites 38 and 24. This beetle is found throughout the Central Valley in elderberry (*Sambucus sp*.) shrubs, on which it is completely

dependent for larval development, and to a lesser degree, adult feeding. Typical habitat is characterized as large stands of mature elderberry shrubs in riparian or floodplain areas.

Within the Study Area, only two of the Well Sites, 24 and 38, were found to support *Sambucus*. Neither of these plants were found to contain evidence of VELB. However, at sites where *Sambucus* is present, VELB may be present.

Swainson's hawk (*Buteo swainsoni*). State Threatened. Moderate Potential. Swainson's hawk is a summer resident and migrant in California's Central Valley and scattered portions of the southern California interior. Areas typically used for nesting include the edges of narrow bands of riparian vegetation, isolated patches of oak woodland, lone trees, and also planted and natural trees associated with roads, farmyards, and sometimes adjacent residential areas. Foraging occurs in open habitats including grasslands, open woodlands, and agricultural areas. Swainson's hawk is not uncommon in the lower Sacramento Valley in locations where nest trees and foraging habitat are present.

There are trees within or adjacent to the Well Sites that could support nesting by Swainson's hawk and documented occurrences are present near several of the Well Sites and prevalent in the Sacramento area. All the Well Sites have potentially suitable nesting trees within 0.25 miles, though many of these have reduced potential to support the species due to their context in the urban setting and other factors. The entire Study Area is within foraging distance of suitable feeding areas. The foraging quality in most of the Study Area itself is diminished due to the majority of it being developed and managed, though a few of the Well Sites may occasionally be visited by foraging Swainson's hawk.

Burrowing owl (*Athene cunicularia*). CDFW Species of Special Concern. Unlikely at Most Well Sites, Moderate in the Vicinity. Burrowing owl occurs as a year-round resident and winter visitor in much of California's lowlands, inhabiting open areas with sparse or non-existent tree or shrub canopies. Typical habitat is annual or perennial grassland, although human-modified areas such as agricultural lands and airports are also used. This species is dependent on burrowing mammals to provide the burrows that are characteristically used for shelter and nesting, and in northern California, it is typically found in close association with California ground squirrels (*Otospermophilus beecheyi*). Manmade substrates such as pipes or debris piles may also be occupied in place of burrows.

No burrowing owls were observed within the Study Area. Burrows or burrow analogues were seen at Well Sites 7, 13, and 16. Wells 19, 20 and 28 have small culverts near the potential work areas that could be used by burrowing owls. Additional structures that may support burrowing owls are located outside the Study Area, but within its vicinity.

Loggerhead shrike (*Lanius ludovicianus*). CDFW Species of Special Concern. Unlikely or Moderate Potential in the Study Area. The loggerhead shrike is a year-round resident and winter visitor in lowlands and foothills throughout California. This species is associated with open country with short vegetation and scattered trees, shrubs, fences, utility lines and/or other perches. Although they are songbirds, shrikes are predatory and forage on a variety of invertebrates and small vertebrates. Captured prey items are often impaled for storage purposes on suitable substrates, including thorns or spikes on vegetation, and barbed wire fences. Loggerhead shrike nests in trees and large shrubs and nests are usually placed three to ten feet off the ground (Shuford and Gardali 2008).

The majority of the Study Area provides only marginal habitat for the species to nest and forage. Because potentially suitable habitat is present and the species has been documented in the region, the species has potential to occur and nest.

Giant garter snake (GGS; *Thamnophis gigas*). State Threatened, Federal Threatened, NBHCP species. Unlikely at Well Sites 19 and 39. No Potential at Remaining Well Sites. This endemic species of snake is found only in the Sacramento and San Joaquin Valleys. The giant garter snake prefers freshwater marshes and low gradient streams but has adapted to drainage channels and irrigation ditches. The giant garter snake inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley.

Though GGS is assessed as unlikely to occur, it is discussed further here because of its listed status and its inclusion in the NBHCP. Within the Study Area, there are no sites that have suitable habitat that have connectivity to populations that are presumed extant. Well Site 19 is located near an occurrence that is presumed to be extant but there is no suitable aquatic habitat onsite and the terrestrial areas lack refugia. Rip-rap and aquatic habitat adjacent to the site may potentially support GGS. This Well Site is within 200 feet of potentially occupied habitat and is within the NBHCP area.

Well Site 39 has an occurrence for GGS within it, but the area is developed, lacking suitable habitat, and the CNDDB description of the occurrence is "possibly extirpated", as are the majority of the occurrences in the Study Area's vicinity.

The remainder of the Study Area either does not contain suitable habitat to support this species and/or is separated from other suitable habitat by urban development, roadways, and disked fields. There is no suitable habitat for this species within 200 feet of the majority of the Study Area. Additionally, giant garter snake occurrences that are near Well Sites in the rest of the NBHCP are considered possibly extirpated, including the occurrences in closest proximity to the Study Area, (CDFW 2020). Land use changes in the vicinity have eliminated suitable habitat.

NBHCP Species Outside of the Study Area

The following buffers were evaluated for species covered under the NBHCP (Well Sites 15, 19, 20, 23, and 39) except when assessment would require entering properties where access was not granted:

- A 250-foot area surrounding the Study Areas within the NBHCP area was evaluated to determine whether any vernal pools, swales, or other seasonal wetlands capable of supporting vernal pool-associated species such as vernal pool fairy shrimp (*Branchinecta lynchi*), midvalley fairy shrimp (*B. mesovallensis*), vernal pool tadpole shrimp (*Lepidurus packardi*), western spadefoot toad (*Spea hammondii*), and California tiger salamander (*Ambystoma californiense*) were present. The 250-foot surrounding areas are either developed, have been disked or otherwise disturbed in such a way that no wetland features that would support vernal pool-associated species would be present.
- No Elderberry (*Sambucus* spp.) shrubs, the host plant for VELB, were observed at Well Sites subject to the NBHCP. However, Well Site 23 is within 1000 feet of riparian habitat that could support elderberry.
- No tricolor blackbird (*Agelaius tricolor*) nesting habitat was observed within 500 feet of the Study Area within the NBHCP area. .

- No Aleutian Canada geese (*Branta canadensis leucopareia*) were observed within the Study Area within the NBHCP area. .
- No white-faced ibis (*Plegadis chihi*) nesting habitat was observed within 0.25 mile of the Study Area within the NBHCP area.
- Loggerhead shrike (*Lanius ludovicianus*) nesting habitat was observed within 100 feet of the Study Area within the NBHCP area.
- No bank swallow (*Riparia riparia*) nesting habitat was observed within 250 feet of the Study Area within the NBHCP area.

5.3 Wildlife Corridors and Native Wildlife Nursery Sites

The Study Area is not within a designated wildlife corridor (CalTrans 2010). The site is located within a highly urbanized landscape. While common wildlife species presumably utilize the site to some degree for movement at a local scale, the Study Area itself does not provide corridor functions for most species and the limited scale of each Well Site further reduces the potential for these areas to play a significant role for wildlife transit. There is no Essential Fish Habitat or designated Critical Habitat within the Study Area. Well Site 39 has nearby nesting herons and egrets. Heron and egret nest sites are protected from disturbance that could result in nest failure or abandonment while active.

6.0 ANALYTICAL METHODOLOGY AND SIGNIFICANCE THRESHOLD CRITERIA

Pursuant to Appendix G, Section IV of the State CEQA Guidelines, a project would have a significant impact on biological resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and/or,

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

These thresholds were utilized in completing the analysis of potential project impacts for CEQA purposes. For the purposes of this analysis, a "substantial adverse effect" is generally interpreted to mean that a potential impact could directly or indirectly affect the resiliency or presence of a local biological community or species population. Potential impacts to natural processes that support biological communities and special-status species populations that can produce similar effects are also considered potentially significant. Impacts to individuals of a species or small areas of existing biological communities may be considered less than significant if those impacts are speculative, beneficial, *de minimis*, and/or would not affect the resiliency of a local population.

7.0 IMPACTS AND MITIGATION EVALUATION

Using the CEQA analysis methodology outlined in Section 6.2 above, the following section describes potential significant impacts to sensitive resources within the Well Site as well as suggested mitigation measures which are expected to reduce impacts to less than significant. Table 6 indicates the potential constraints that may be present at each Well Site.

Table 6. Potential Sensitive Communities, City Trees and Special Status-species Constraints by Well Site

Well Site	Rare Plants	Wetlands	Ephemeral Ditches and/or Canals	Nesting and Special-status Birds	Giant Garter Snake	Vernal Pool Fairy Shrimp	Valley Elderberry Longhorn Beetle	Natomas Basin HCP	City Trees
2		YES	YES	YES		YES			YES
3				YES					YES
4				YES					YES
5				YES					YES
6				YES					
7	YES			YES					YES
8				YES					YES
9				YES					YES
10				YES					
11	YES			YES					
12	YES	YES		YES		YES			
13	YES	YES		YES		YES			
14				YES					
15	YES			YES				YES	
16				YES					YES
17				YES					
18				YES					
19				YES	YES*			YES	
20	YES			YES				YES	
21	YES			YES					YES
22				YES					
23				YES				YES	YES
24	YES		YES	YES			YES		
25				YES					
26				YES					YES
27				YES					YES
28	YES	YES		YES		YES			
29		YES		YES		YES			
30		YES	YES	YES		YES			YES
31	YES			YES					
32	YES			YES					YES
33				YES					
34				YES					
35				YES					YES
36				YES					YES
37	YES	YES		YES		YES			
38				YES			YES		

39			YES	YES	YES*			YES	
Section with discussion of mitigation		7.2, 7.3, 7.5	7.2, 7.3, 7.5	7.1	*Unlikely to occur but surveys required due to NBHCP (7.6)	7.1	7.1	7.6	7.5

7.1 Special-status Species and Nesting Birds

This section analyzes the Project's potential impacts and mitigation for special-status species in reference to the significance threshold outlined in CEQA Appendix G, Part IV (a):

> *Does the project have the potential to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

Potential impacts and mitigation for potentially significant impacts are discussed below.

Special-Status Plant Species

Five special-status plant species have the potential to occur within non-native grassland habitat within the Study Area. As these species have peak blooming periods in April and May, presence or absence could not be determined during the June site visit and therefore the plants may potentially be present. As these species are considered special-status due to limited distribution within California and/or elsewhere, impacts to populations are considered a **potentially significant impact** under CEQA. None of the four species is "covered" under the Natomas Basin HCP.

> **Potential Impact Bio-1**: The Proposed Project may directly or indirectly impact special-status plant populations.

To reduce impacts to special-status plant populations to less than significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-1:** Conduct protocol-level special-status plant surveys in April and May within areas of non-native grassland and suitable wetlands with potential to support special-status plants, specifically at Well Sites 7, 11, 12, 13, 15, 20, 21, 24, 28, 31, 32, and 37. The surveys shall be performed in accordance with those described by resource experts and agencies (CNPS 2001, CDFW 2018a, USFWS 1996). If individuals or populations are observed, they shall be mapped and notes regarding size of population, quality of habitat and potential threats taken. Populations shall be avoided to the greatest extent practical, with a recommended minimum 25-foot buffer from the edge of the population. Prior to Project activities within the vicinity of the populations, the population and associated 25-foot buffer shall be flagged or otherwise made visible. No work shall occur within that flagged area and personnel shall avoid entering the area to the greatest extent practical.

If avoidance of a population or individual is not practical, a Habitat Mitigation and Monitoring Plan (HMMP) shall be drafted for the species being impacted. The HMMP shall provide guidance for restoring, enhancing, and/or creating suitable habitat for the species being impacted, and shall also provide success criteria which will ensure success of mitigation efforts. Mitigation ratios shall be a minimum of 2:1 for either percent cover or number of individuals. The HMMP shall be final upon approval by the City of Sacramento and interested regulatory agencies.

Implementation of this mitigation measure will reduce potential impacts to special-status plants to a level that is less than significant.

Swainson's Hawk

Swainson's hawk is a CESA-listed raptor that regularly nests in the vicinity of the Study Area. No permanent loss of SWHA habitat is anticipated due to the Proposed Project. It is anticipated that in Well Sites where potential foraging habitat is present, this habitat will remain at approximately the same extent and quality after the Project. During construction of the Project, some areas may be temporarily disturbed and SWHA may avoid the active construction areas at that time. No nesting trees for SWHA would be removed for the Project. If SWHA nests near a Well Site and construction activities are sufficient to disturb the active nest to the extent that the active nest was abandoned, this abandonment would be considered "take" under CESA. If no impact avoidance or minimization measures are implemented, direct mortality to dependent young could occur to individual SWHA present in these areas during construction. Because SWHA are listed as threatened under CESA, take of individuals is considered a **significant impact** under CEQA.

Potential Impact BIO-2: The Proposed Project's construction activities in the Well Sites could result in take of State-threatened SWHA, which would be considered a significant impact.

To reduce potential impacts to SWHA to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-2a: Initial ground disturbing activities will commence outside of the SWHA nesting season (March 1- September 15).

or

Mitigation Measure BIO-2b: If initial ground disturbing activities will commence during the SWHA nesting season (March 1- September 15), surveys based on CDFW's survey protocol shall be conducted. These surveys will include a pre-arrival assessment conducted between January 1 and March 1, to identify areas with suitable nesting sites within 0.25 miles of the Well Sites that will have activity in that year. The survey extent will include areas up to 0.5 miles for Well Sites located in the Natomas Basin Habitat Conservation Plan (NBHCP) area (Well Sites 15, 19, 20, 23 and 39). For Well Sites determined to have suitable nesting habitat within 0.25 miles or within 0.5 miles in the NBHCP area surveys will be conducted for SWHA nesting during the nest-building period (April 1-April 30) if work will begin between April 1 and May 30). For activities that will commence after June 1, surveys for active nests will be conducted between June 1 and August 1. Any active nests shall be avoided at a distance sufficient to ensure that nest abandonment will not occur and this distance shall be determined

through observation of the nest by a qualified biologist. Avoidance shall be maintained until dependent young are no longer present. Survey radius for these surveys shall be 0.25 miles except for sites within the NBHCP area, where survey radius shall extend 0.5 miles from the site.

Burrowing Owl

The Project may affect burrowing owl if present during Project development. Potential impacts to burrowing owl could occur during the removal of burrow-like structures. These activities could result in the direct removal or destruction of active nests or occupied refugia or may create audible, vibratory, and/or visual disturbances that cause birds to abandon active nests. Because burrowing owl are a CDFW SSC, harming a burrowing owl is a **potentially significant impact** under CEQA.

Potential Impact BIO-3: The Proposed Project's construction activities in the Well Sites could result in harm to burrowing owl, which would be considered a potentially significant impact.

To reduce potential impacts to burrowing owl to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-3: An assessment survey for burrowing owls shall be conducted at all well sites by a qualified biologist in the year of construction, prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) regardless of time of year. The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or ground disturbing activities if these activities commence between February 1 and August 31, the timeframe that corresponds to the burrowing owl nesting season. If the results of the surveys indicate that burrowing owl may be impacted by project activities or if the Well Site is in the NBHCP area, the following measure shall apply:

- Preconstruction surveys in accordance with CDFW (CDFG) burrowing owl guidelines shall be conducted, summarized as: The Project Area and surrounding area (up to 500 feet if habitat has potential to support burrowing owl and no barriers preclude burrowing owls) shall be traversed on foot to detect burrowing owls. The survey will be conducted using transects spaced no more than 50 feet apart. For sites determined to have potential to support nesting burrowing owls, at least 3 site visits for burrowing owl shall occur between April 15 and July 15, with at least one site visit after June 15. Visits are to be at least 15 days apart.
- If any burrowing owl nest is identified during preconstruction surveys, the applicant shall comply with all CDFW guidelines regarding the minimization of impacts to the burrowing owl, including not disturbing an occupied nest during nesting season (February 1 through August 31) unless a qualified biologist approved by the Department verifies through noninvasive methods that either:
  (1) the owls have not begun egg-laying and incubation; or
  (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.
- Any owls identified in the preconstruction surveys shall be relocated to appropriate locations using passive relocation techniques approved by the CDFW and mitigation for impacts to

burrowing owl nests shall be provided and funded by the applicant in accordance with CDFW guidelines and requirements.

Valley elderberry longhorn beetle

The Project may affect VELB if present during Project development. Potential impacts to VELB could occur during the removal of its host plant, *Sambucus,* if occupied by VELB eggs, larvae or adult life stages. Because VELB are a Federal-threatened species, take of a VELB is a **significant impact** under CEQA.

> **Potential Impact BIO-4:** The Proposed Project's construction activities in the Well Sites could result in take of Federal-threatened VELB, which would be considered a significant impact.

To reduce potential impacts to VELB to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measure BIO-4:** Prior to initial ground disturbance, a survey for the valley elderberry longhorn beetle (VELB) host plant, *Sambucus*, will be conducted at all sites where *Sambucus* has been detected (Well Sites 38 and 24) and all sites within the NBHCP. *Sambucus* plants, if detected, shall be avoided by at least 20 feet from the dripline of the plant and this avoidance buffer shall be clearly demarcated using lathe and flagging. If *Sambucus* plants with a stem diameter of greater than 1 inch cannot be avoided, they shall be inspected for evidence of VELB presence and if any evidence of VELB is detected, the plants shall be avoided and consultation with the USFWS shall occur to determine next steps, which may include relocation of the plant. If the Well Site where the *Sambucus* is located in the NBHCP, new consultation would not be required, but removal of *Sambucus* shall be conducted and mitigated for in accordance to the NBHCP.

Vernal Pool Fairy Shrimp (VPFS)

VPFS is a broad-ranging federal-listed vernal pool crustacean that occurs in wetlands, vernal pools and man-made features such as ditches. VPFS can occupy pools that contain water for around 3-4 weeks. If Project Activities were to impact habitats that are occupied by VPFS, this would be a **significant impact**.

> **Potential Impact BIO-5:** The Proposed Project's construction activities in the Well Sites could result in take of Federal-threatened VPFS, which would be considered a significant impact.

To reduce potential impacts to VPFS to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-5a: Ground disturbance activities at Well Sites 2, 24, 28, and 30 shall be conducted in the dry season (May through October) and work at other sites shall be in the dry season to

the greatest extent practical. Work within 200 feet of wetlands and ephemeral ditches will occur only in the dry season (June 1-October 31) and only in dry soils. Wetlands will be avoided by at least 100 feet and best management practices shall be implemented to prevent any potential increased erosion of sediment or turbid water from project activities into these features. If work is to be conducted from November through April, silt fencing shall be installed prior to ground disturbance around the perimeter and associated 25-foot buffer of avoided wetlands and the top of bank of drainage canals. Silt fencing adjacent to drainage canals shall be installed the greatest distance possible from the top of bank, while still maintaining prevention of runoff into the feature.

Or

Mitigation Measure BIO-5b: Prior to initial ground disturbance, protocol-level surveys for vernal pool fairy shrimp (VPFS) will be conducted at all sites where with potential to support VPFS (Well Sites 2, 24, 28, and 30). If VPFS are detected, and cannot be avoided, a permit for take coverage of the species, pursuant to the Federal Endangered Species Act will be acquired prior to commencement of Project Activities.

White-tailed Kite, Loggerhead Shrike and Common Nesting Birds

The Project may affect special-status birds including loggerhead shrike and white-tailed kite. In addition to special-status species, non-special-status native birds that are protected by the CFGC may also be impacted. Potential impacts to these species and their habitats could occur during the removal of vegetation or during ground-disturbing activities. These activities could result in the direct removal or destruction of active nests or may create audible, vibratory, and/or visual disturbances that cause birds to abandon active nests. Because nesting birds are protected by CFGC, destruction of an active nest or mortality of dependent young would be considered a **significant impact** under CEQA.

> **Potential Impact Bio-6**: The Proposed Project may directly or indirectly impact nesting birds, including special-status species.

To reduce impacts to nesting birds to less than significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-6:** A survey for active bird nests at all sites shall be conducted by a qualified biologist no more than 14 days prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) if ground disturbing activities commence during the nesting season (February 1 through August 31). The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or grading activities. For white-tailed kite, the survey area shall extend at least 0.25 miles from the area of potential disturbance. Based on the results of the pre-construction breeding bird survey, the following measure shall apply:
>
> - If active nests of protected species are found within the Well Site, or close enough to the area to affect nesting success, a work exclusion zone shall be established around each nest. Established exclusion zones shall remain in place until all young in the nest have fledged or the nest otherwise becomes inactive (e.g. due to predation). Appropriate exclusion zone sizes shall be established by a qualified biologist. Sizes of exclusion zones vary dependent upon bird species, nest location, existing visual buffers, ambient sound levels, and other factors; an exclusion zone radius may be as small as 25 feet (for common, disturbance-adapted species) or more than 250 feet for raptors.

Listed species are typically provided more extensive exclusion zones, which may be specific to the species and/or follow CDFW guidance. Exclusion zone size may also be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest.

7.2 Sensitive Land Cover Types

This section addresses the question:

> *b) Does the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;*

The Study Area contains two sensitive natural communities: seasonal wetlands and creeping ryegrass flat. The seasonal wetlands within the Study Area are under the jurisdiction of the RWQCB under Section 401 of the CWA and the Porter-Cologne Act. All but one feature, seasonal wetland at Well Site 2 are not under jurisdiction of the Corps under Section 404 of the CWA as they do not have direct connectivity to intermittent or perennial streams. The seasonal wetland at Well Site 2 is considered both RWQCB and Corps jurisdiction, and is thus described as a potential impact to Waters of the State and Waters of the U.S. Because seasonal wetlands are regulated by the RWQCB, impact to the community is considered a **potentially significant impact** under CEQA. Potential seasonal wetlands are present at Wells 2, 12, 13, 28, 29, 30, and 37. Project activities may directly or indirectly impact seasonal wetlands.

> **Potential Impact Bio-7**: Project activity may result in direct or indirect fill or discharge into seasonal wetlands.

To reduce potential impacts to potential seasonal wetlands to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-7a**: A wetland delineation shall be conducted at Well Sites 2, 12, 13, 28, 29 30 and 37 to collect information on the three wetland parameters at each of the potential wetlands, according to the methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West* ("Arid West Supplement"; Corps 2008), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Arid West data forms shall be filled out and a report on the results will be provided. The report will provide the information and results of the delineation. A final jurisdictional determination shall be obtained from the Corps if deemed necessary.

> **Mitigation Measure Bio-7b**: Any wetlands within the Study Area shall be avoided to the greatest extent practical. A 25-foot buffer around the perimeter of each wetland shall be included and avoided. Prior to ground disturbance, the 25-foot buffer shall be clearly flagged by a qualified biologist. If wetlands cannot be avoided, appropriate permits shall be obtained from the appropriate regulatory agencies (e.g., RWQCB and Corps). Mitigation measures outlined in the permits shall be followed; however, mitigation ratios shall be no less than 1:1 for impacted

wetland acreage, which follows the City of Sacramento General Plan ER. 2.1.6, which requires on- or off-site preservation of equal amounts impacted. If impacts to seasonal wetlands shall occur, mitigation may include, but are not limited to on-site restoration/enhancement/creation, or purchase of credits at an approved mitigation bank. **Mitigation Measure Bio-5a** as described above shall also be implemented for the protection of wetlands.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

Creeping ryegrass flats, which is ranked as S3 by CDFW, is only located at Well Site 28 within the proposed activity area and associated 100-foot buffer. The S3 ranking by CDFW indicates this natural community is at a moderate risk of extirpation due to limited range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors (NatureServe 2020). Because this natural community is considered sensitive by CDFW due to reasons listed above, impact to the community is considered a **potentially significant impact** under CEQA.

Potential Impact Bio-8: The Proposed Project may directly or indirectly impact creeping ryegrass flats. This natural community is also a potential wetland as creeping ryegrass is a wetland indicator species. If a wetland delineation determines this area to be a wetland, Mitigation Measures Bio-7 above, shall be implemented.

If a wetland delineation determines this area to not be a wetland, to reduce potential impacts to creeping ryegrass flats to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure Bio-8: Prior to ground disturbance or staging of materials at Well 28, the edge of the creeping ryegrass flats and associated 10-foot buffer shall be flagged by a qualified biologist and shall be avoided. If Project activities cannot avoid the buffered area, then a Habitat Mitigation and Monitoring Plan (HMMP) shall be drafted. The HMMP shall provide guidance for restoring, enhancing, and/or creating suitable habitat for the creeping ryegrass flat, and shall also provide success criteria which will ensure success of mitigation efforts. Mitigation ratios shall be a minimum of 2:1 for percent cover.
The HMMP shall be final upon approval by the City of Sacramento and interested regulatory agencies.

Implementation of this mitigation measure will reduce this potential impact to a level that is ***less than significant***.

7.3 Aquatic Resources

This section analyzes the Project's potential impacts and mitigation for wetlands and other areas presumed or determined to be within the jurisdiction of the Corps or Regional Water Quality Control Board in reference to the significance threshold outlined in CEQA Appendix G, Part IV (c):

c) Does the Project have the potential to have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

Direct impacts to potential Section 404 wetlands located within the Study Area are avoided due to the preferential siting of project activities in areas that do not contain these features. Potential for indirect impacts exist at Wells 2, 24, 28, and 30, as areas of proposed activities and staging are located within 100-feet of a drainage canal or ditch and no levee is present between the feature and the activity areas. Furthermore, one seasonal wetland located at Well Site 2 is potentially impacted by well site activities, and due to its location adjacent to, and directly connected to a potential jurisdictional drainage canal this feature would be a jurisdictional Waters of the U.S. regulated by the Corps. Potential direct and indirect impacts to jurisdictional wetlands and non-wetland Waters of the U.S. are considered a **potentially significant impact** under CEQA.

> **Potential Impact Bio-9**: Project activity may result in unintentional fill or discharge into seasonal wetland, drainage canals or ditch.

To reduce potential impacts to streams to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measures Bio-5a, 7a-b**, as described above.

Implementation of these mitigation measure will reduce this potential impact to a level that is ***less than significant***.

7.4 Wildlife Corridors and Native Wildlife Nursery Sites

This section analyzes the Project's potential impacts and mitigation for habitat corridors and linkages in reference to the significance threshold outlined in CEQA Appendix G, Part IV (d):

> *d) Does the Project have the potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*

No portions of the Study Area provide connectivity between areas of suitable habitat. For terrestrial species, all portions of the Study Area are within a greater context of urban development, and for aquatic species, there is no connectivity between the Study Area and upstream freshwater habitats. No impact will occur to migratory corridors for terrestrial and aquatic species.

Migratory birds may use portions of the Study Area opportunistically, however, the overwhelming majority of higher quality habitat along the Pacific Flyway exists outside the Study Area. Most of the Study Area is developed or supports disturbed habitats embedded in a highly urbanized setting. Based on these factors, proposed project will result in a **less than significant impact** to migratory corridors and habitat linkages.

7.5 Local Policies and Ordinances

This section analyzes the Project's potential impacts and mitigation based on conflicts with local policies and ordinances in reference to the significance threshold outlined in CEQA Appendix G, Part IV (e):

> *e) Does the Project have the potential to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;*

Local plans and policies related to biological resources examined in this analysis are:

- City of Sacramento Tree Ordinance
- City of Sacramento General Plan Wetland Protection

Potential Impact Bio-10a: Several potential wetlands are present within the Study Area and potential direct and indirect impacts may occur and are subject to the City of Sacramento General Plan ER. 2.1.6, which requires on- or off-site preservation of equal amounts of wetlands impacted.

To reduce potential impacts to wetlands to a less-than-significant level, the following measures shall be implemented: **Mitigation Measures Bio-5a, 7a-b**, as described above.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

The Project may require removal of trees covered by City of Sacramento Tree Ordinance for construction and/or access. All trees on City property qualify as City Trees, as described in Section 12.56.20. Removal of City Trees for public projects requires approval by the director, as outlined in Section 12.56.40. Based on site assessments, 16 of the sites (2, 3, 4, 5, 7, 8, 9, 16, 21, 23, 26, 27, 30, 32, 35, and 36) contain trees within the well activity area. Some or all of these tree may have regulated work conducted, as described in Section 12.56.20, as part of this public project. As City Trees are defined by a local ordinance, potential direct and indirect impacts are considered a **potentially significant impact** under CEQA.

> **Potential Impact Bio-10b**: Project activities may directly or indirectly impact City Trees as defined in the City Tree Ordinance.

To reduce potential impacts to City Trees to a less-than-significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-9:** For trees that cannot be avoided, any removal of City Trees shall follow the guidelines outlined in the Ordinance Section 12.56.40 and permits shall be acquired as outlined in Section 12.56.050.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

7.6 Habitat Conservation Plans

This section analyzes the Project's potential impacts and mitigation based on conflicts with any adopted local, regional, and state habitat conservation plans in reference to the significance threshold outlined in CEQA Appendix G, Part IV (f):

> *f) Does the Project have the potential to conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

Projects located within the NBHCP Area may obtain permits and mitigation coverage through payment of in-lieu fees to the NBHCP and the City of Sacramento is a participant in the HCP. Projects receiving permits through the NBHCP must also implement avoidance and minimization measures included in the NBHCP to reduce the potential for take of covered species. These measures are outlined in Chapter 5 of the NBHCP. The NBHCP requires that the area surrounding the Study Area be assessed to determine whether certain species and/or habitats that could potentially support special-status species are present. The area to be assessed ranges from a 200-foot radius surrounding the Study Area (for giant garter snake [*Thamnophis gigas*]) to a 0.5-mile radius surrounding the Study Area (for Swainson's hawk [*Buteo swainsoni*]).

The Study Area includes five Well Sites (15, 19, 20, 23, and 39) which are located within the NBHCP area. While the City may decide to implement provisions of the NBHCP for impacts that may occur to covered biological resources, no conflict with the NBHCP could be identified. Therefore, the Project would result in **no significant impact**.

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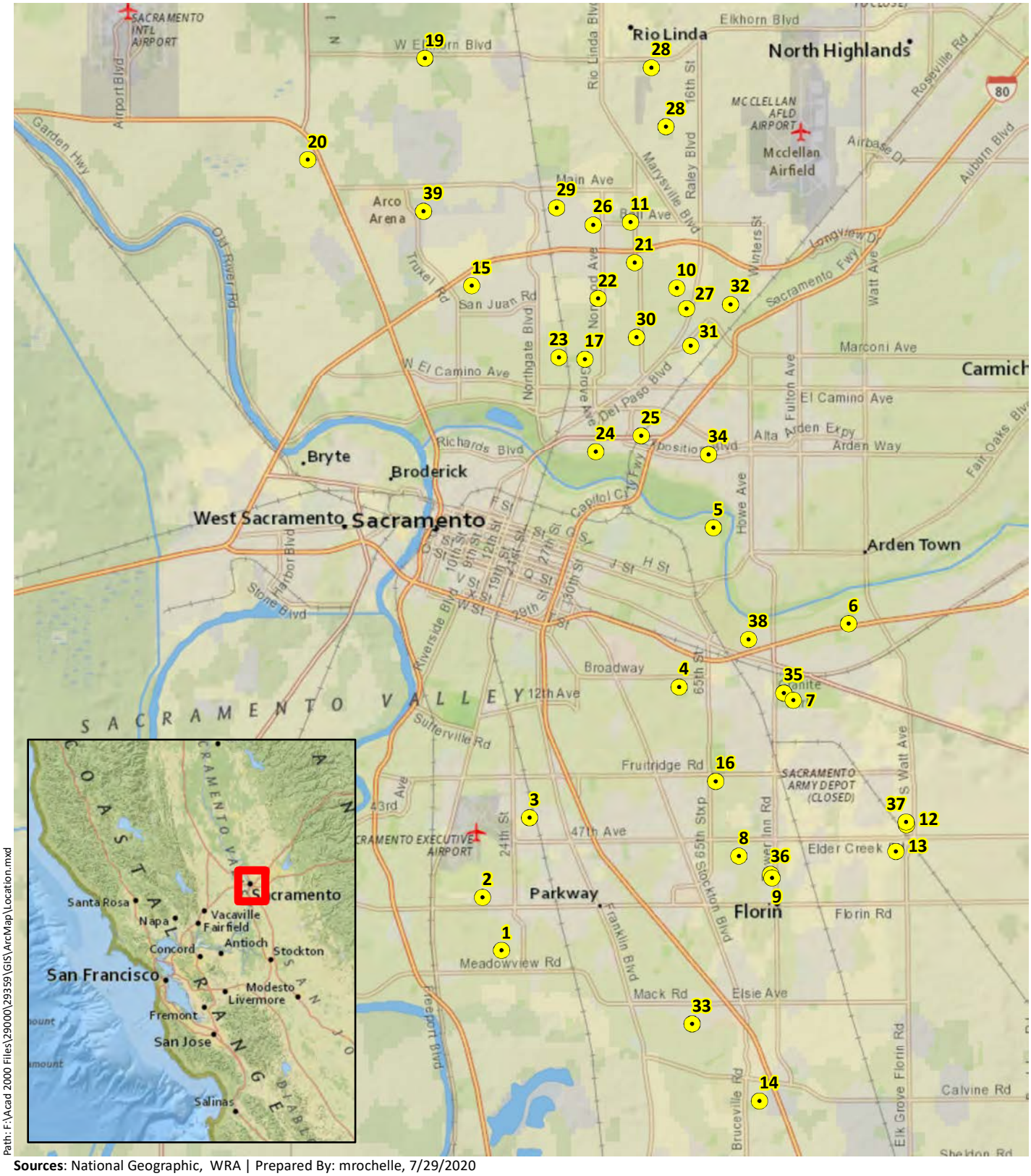
Appendix A -- Figures

Appendix A Figure 1 -- Location



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Sources: National Geographic, WRA | Prepared By: mrochelle, 7/29/2020

Figure 1. Regional Location Map

City of Sacramento Groundwater Master Plan
Sacramento County, California

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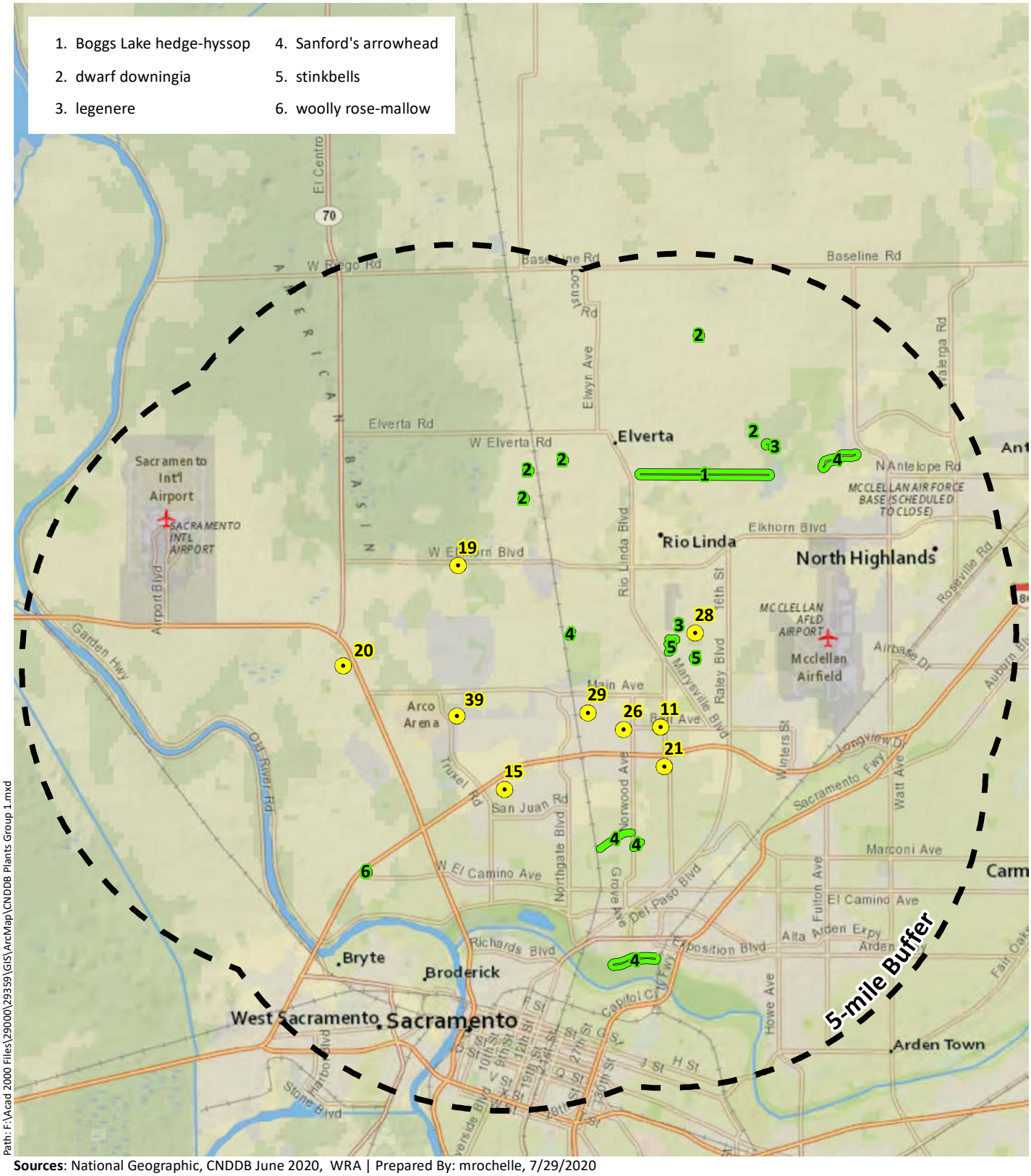
Appendix A -- Figure 2 Special-status Plants



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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2a. Special-Status Plant Species Documented within 5-miles (Well Sites 11,15,19,20,21,26,28,29,39)

City of Sacramento Groundwater Master Plan
Sacramento County, California

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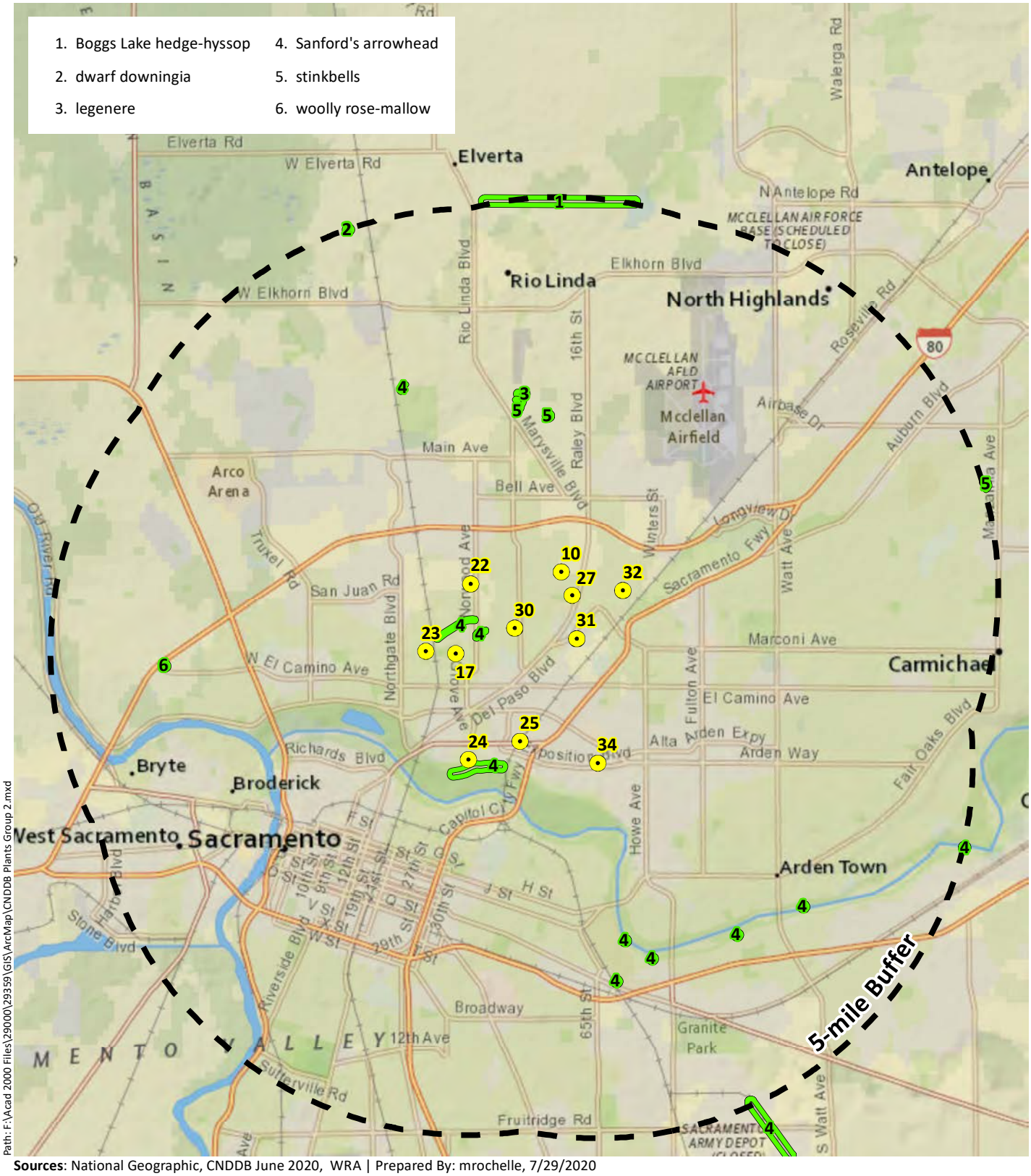

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Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2b. Special-Status Plant Species Documented within 5-miles (Well Sites 10,17,22,23,24,25,27,30,31,32,34)

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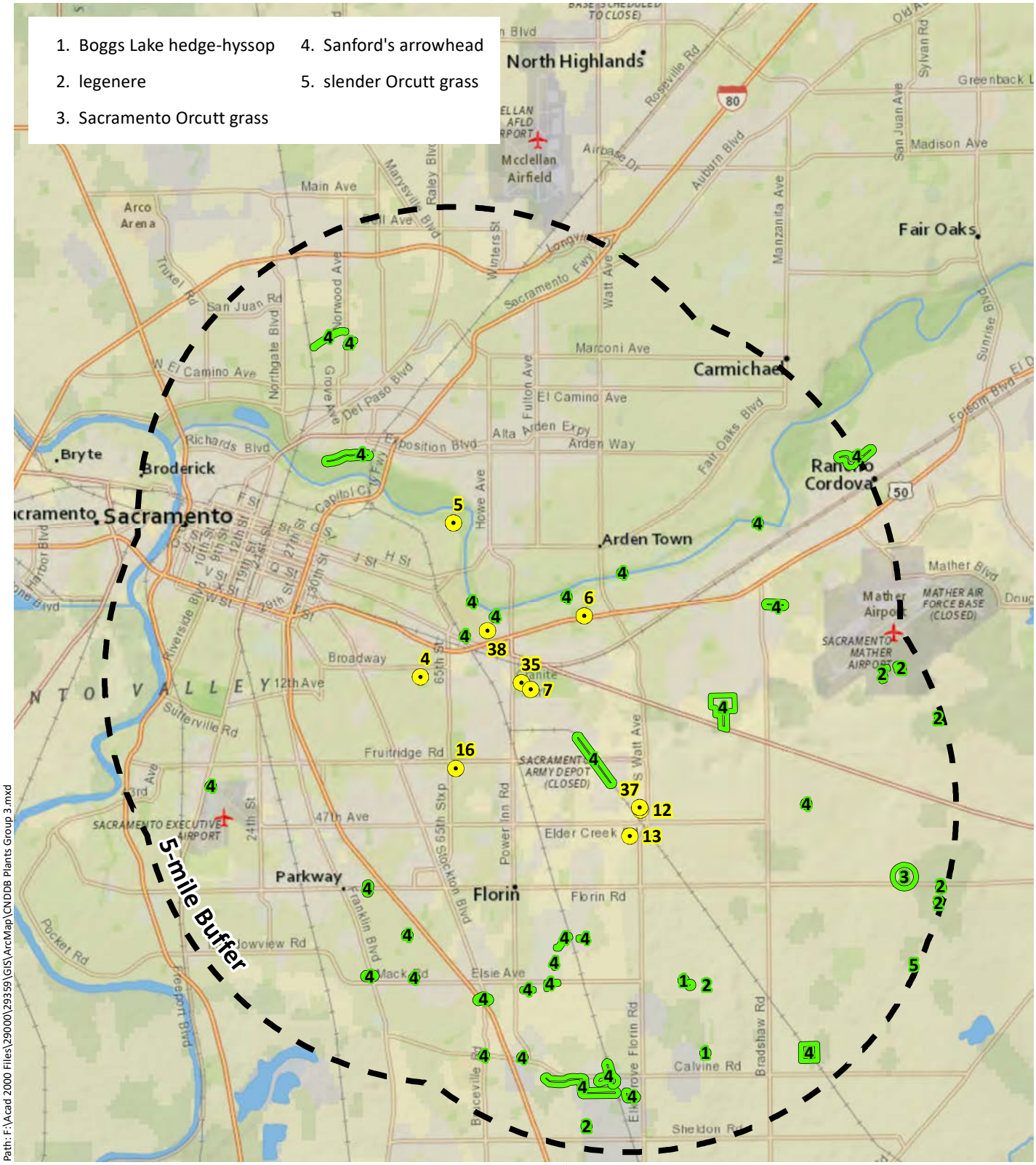


Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\CNDDB Plants Group 3.mxd

Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

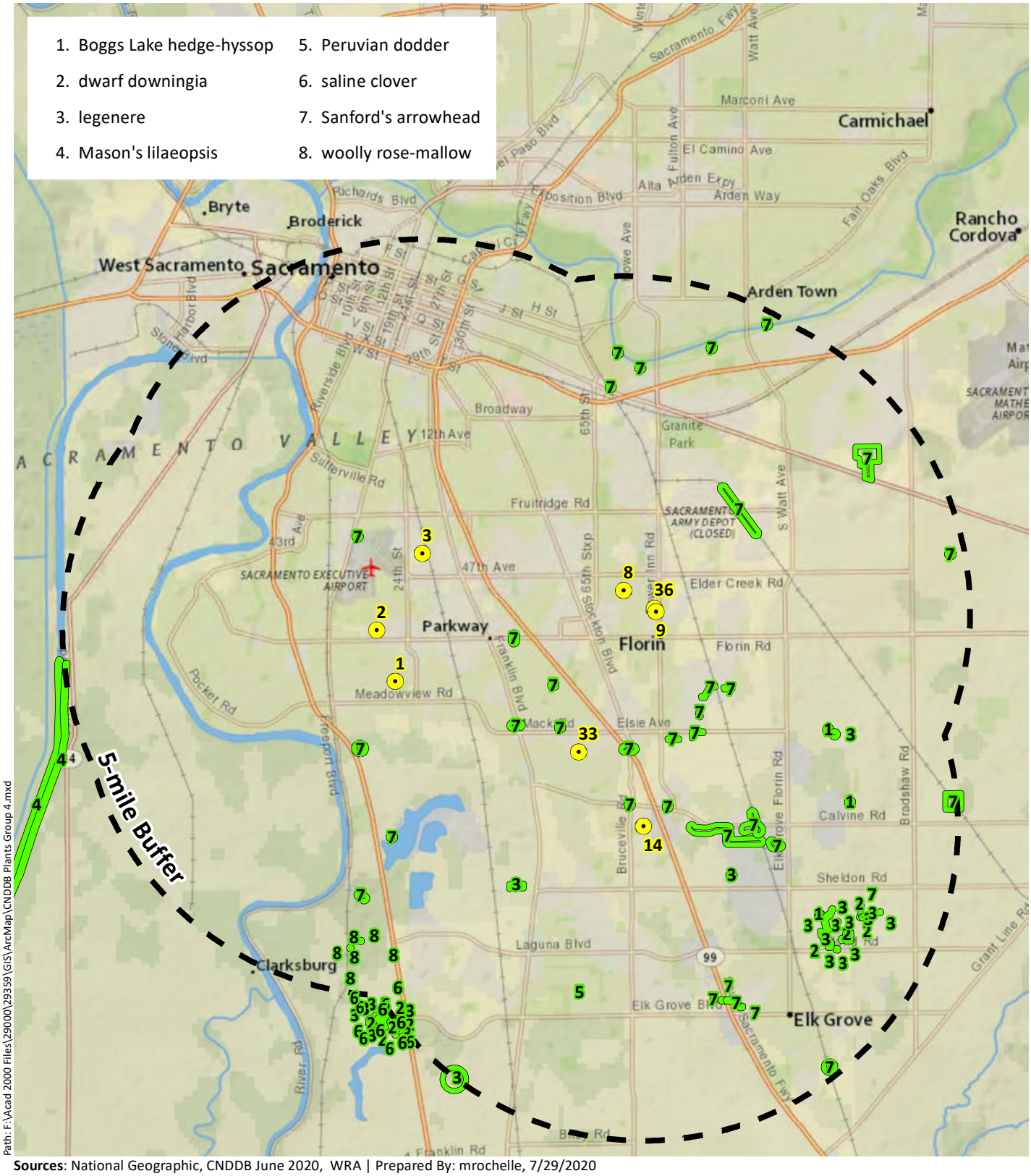
Figure 2c. Special-Status Plant Species Documented within 5-miles (Well Sites 4,5,6,7,12,13,16,35,37,38)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

N

ENVIRONMENTAL CONSULTANTS



Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\CNDDB Plants Group 4.mxd

Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 2d. Special-Status Plant Species Documented within 5-miles (Well Sites 1,2,3,8,9,14,33,36)

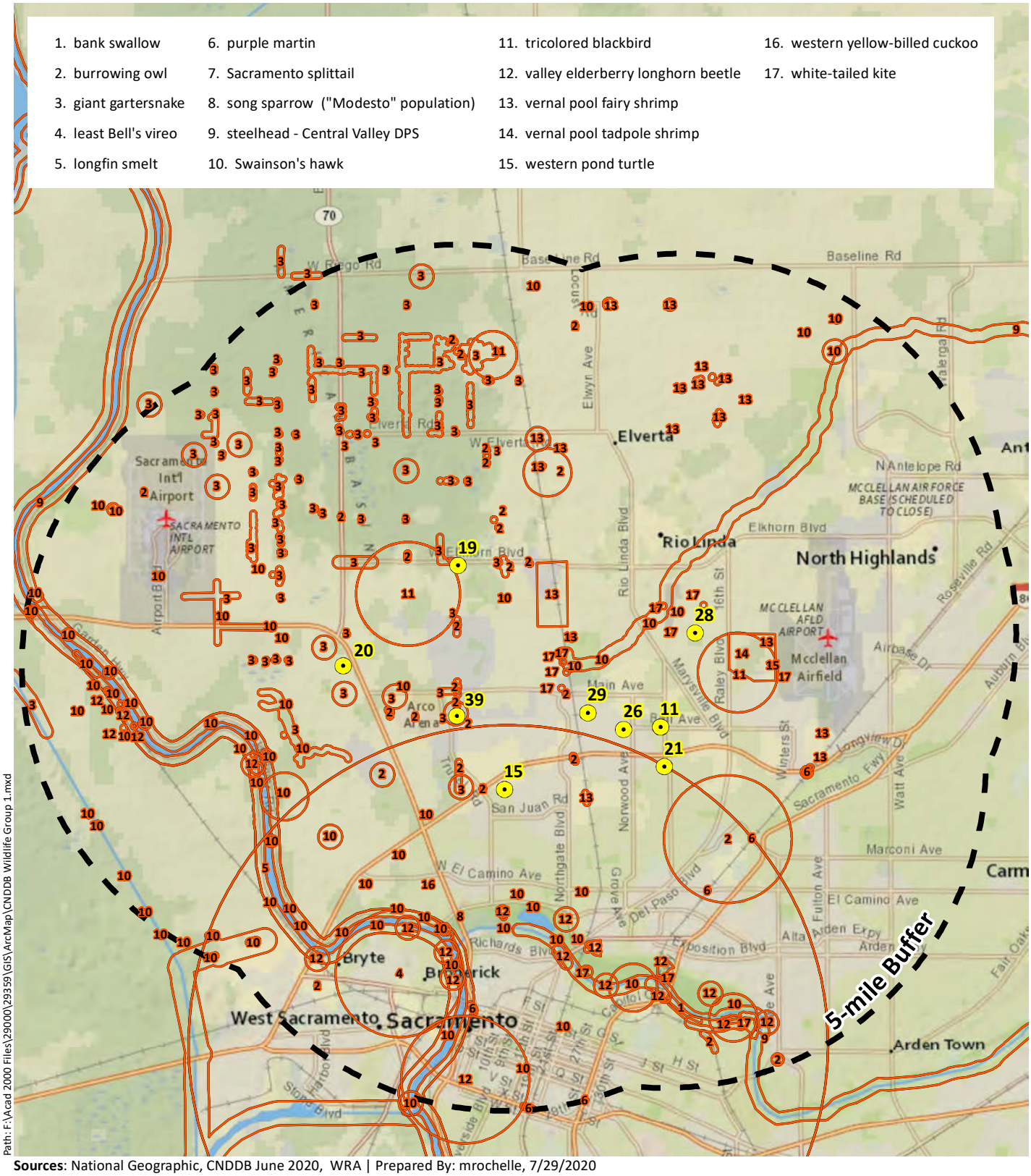
City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

N

wra
ENVIRONMENTAL CONSULTANTS

Appendix A -- Figure 3 Special -status Wildlife



Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

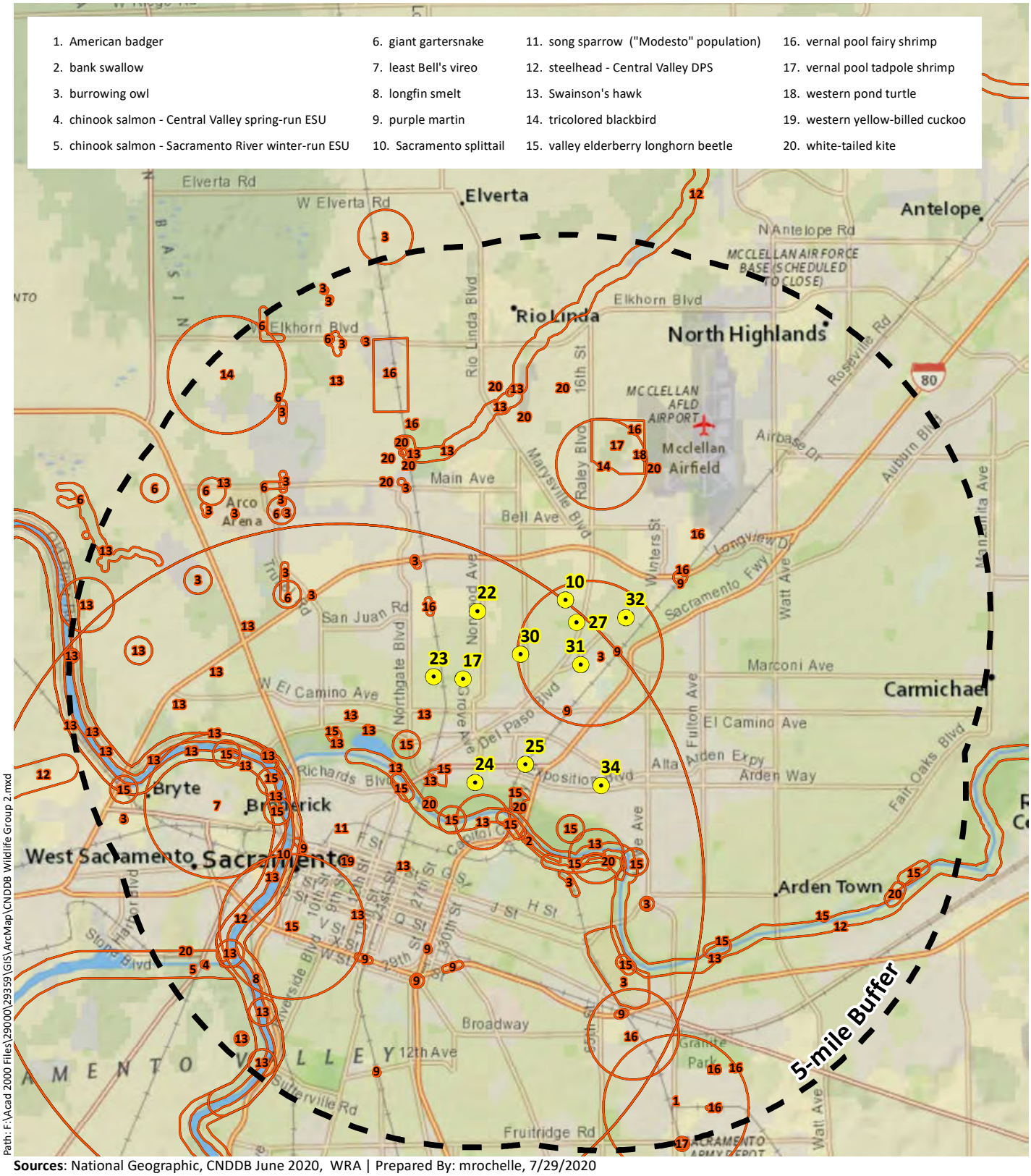
Figure 3a. Special-Status Wildlife Species Documented within 5-miles (Well Sites 11,15,19,20,21,26,28,29,39)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

N

ENVIRONMENTAL CONSULTANTS



Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\CNDDB Wildlife Group 2.mxd

Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

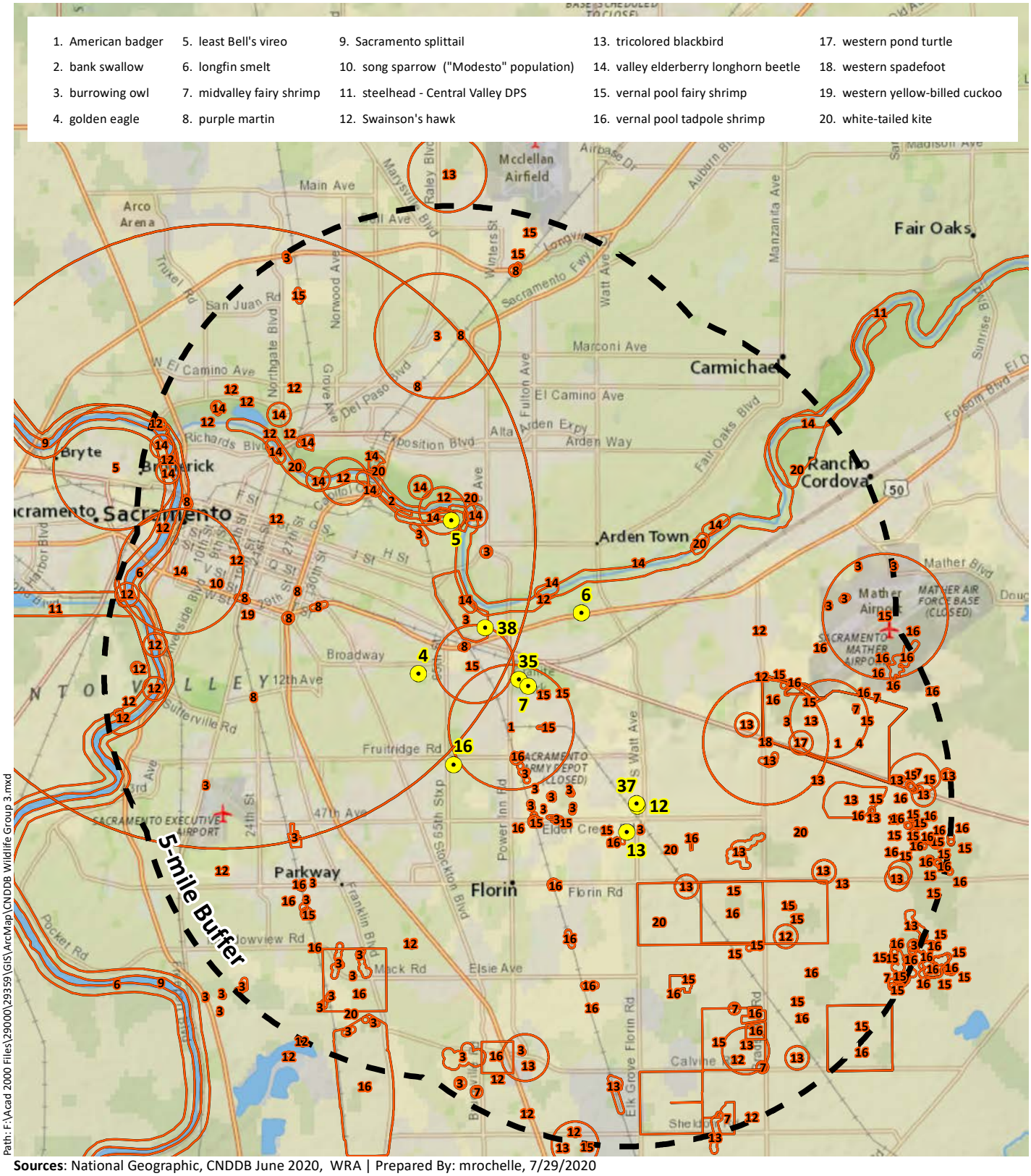
Figure 3b. Special-Status Wildlife Species Documented within 5-miles (Well Sites 10,17,22,23,24,25,27,30,31,32,34)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

N

ENVIRONMENTAL CONSULTANTS



Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\CNDDB Wildlife Group 3.mxd

Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

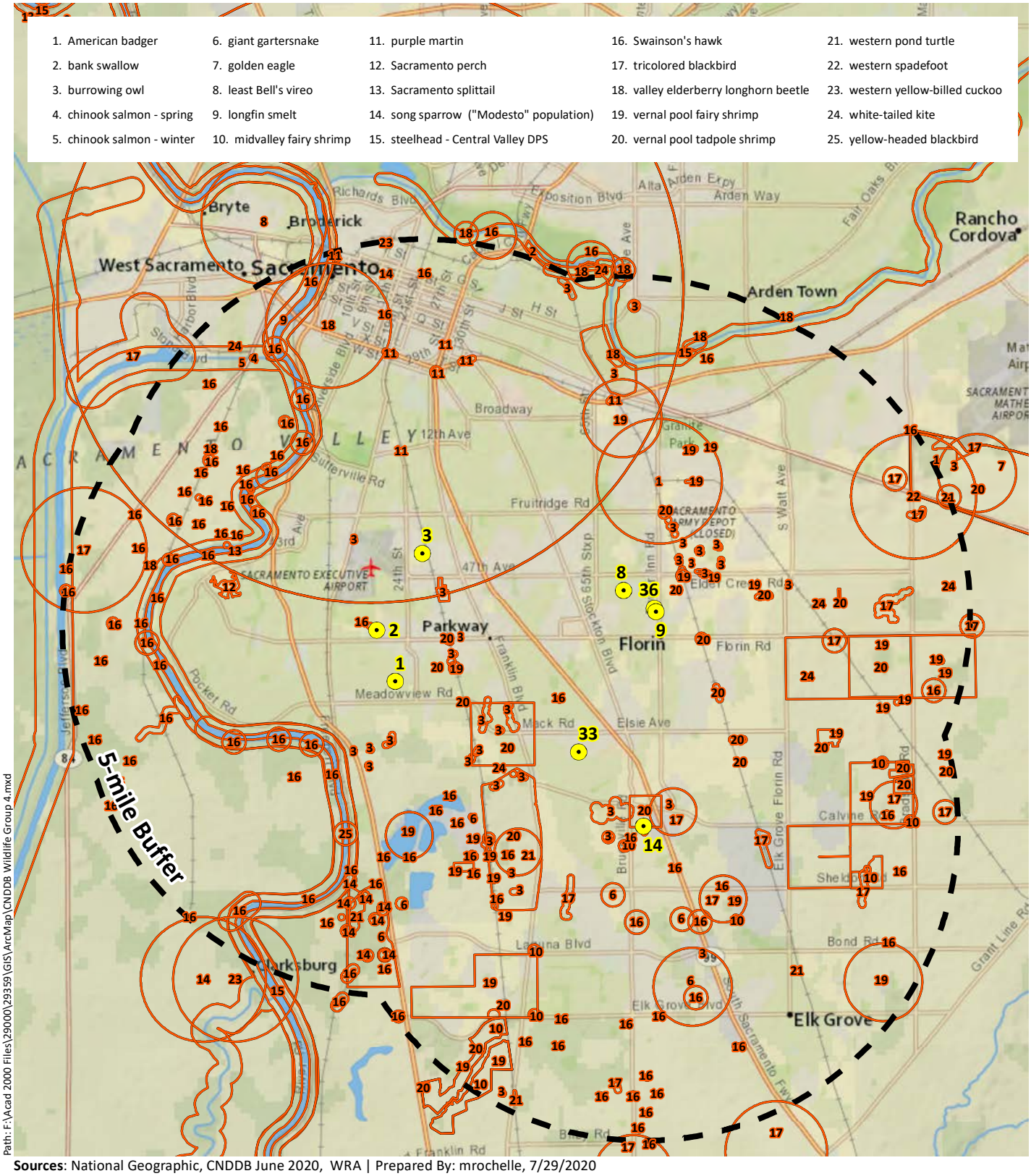
Figure 3c. Special-Status Wildlife Species Documented within 5-miles (Well Sites 4,5,6,7,12,13,16,35,37,38)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

N

ENVIRONMENTAL CONSULTANTS



Sources: National Geographic, CNDDB June 2020, WRA | Prepared By: mrochelle, 7/29/2020

Figure 3d. Special-Status Wildlife Species Documented within 5-miles (Well Sites 1,2,3,8,9,14,33,36)

City of Sacramento Groundwater Master Plan
Sacramento County, California

0 1 2 Miles

N

wra
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Appendix A -- Figure 4 Sensitive Land Cover

Figure 4a. Sensitive Land Cover Types in the Study Area (Well Site 2)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Ditch
Seasonal Wetland

N

0 50 100
Feet

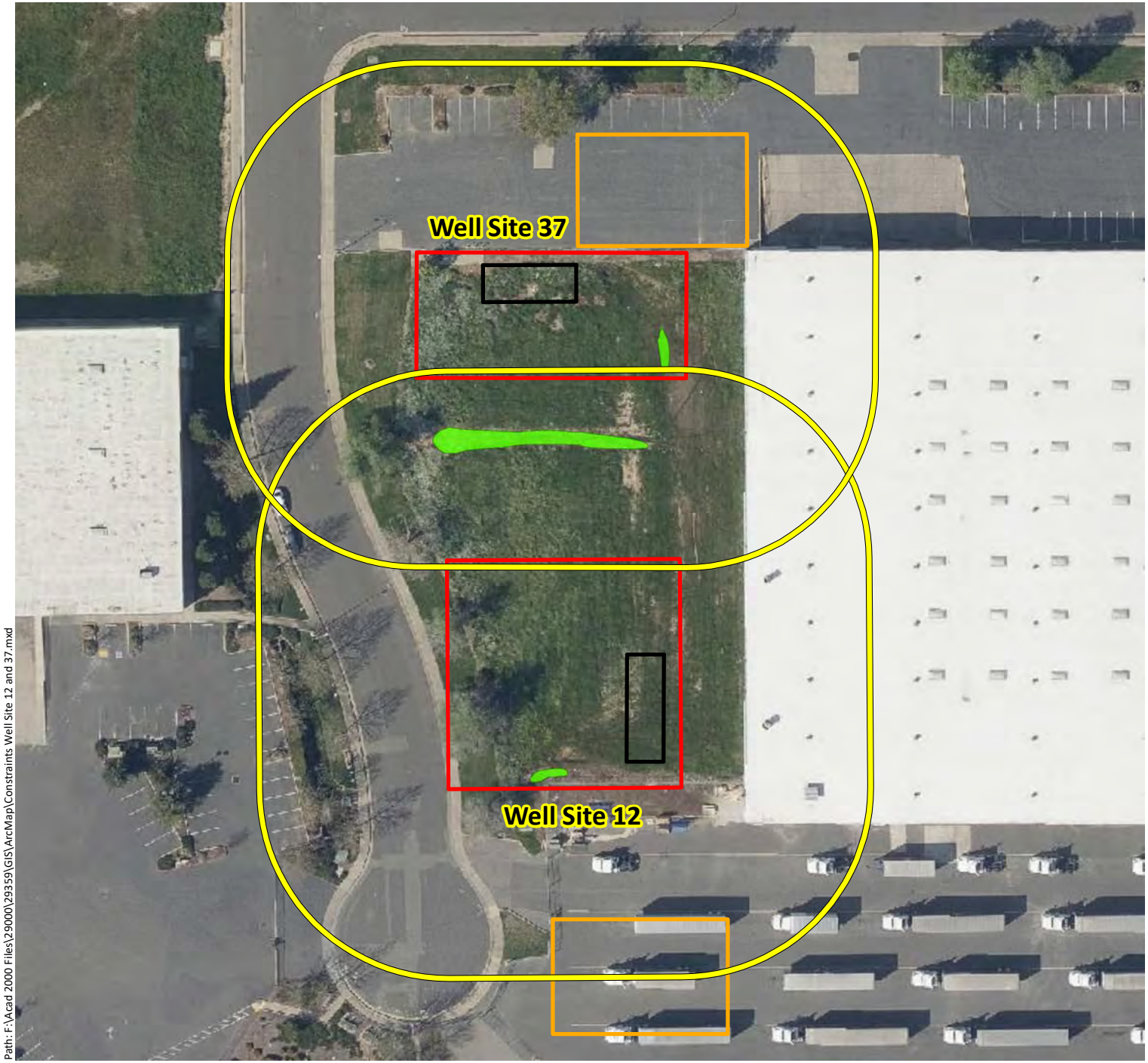
wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 2.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4b. Sensitive Land Cover Types in the Study Area (Well Site 12 & 37)

City of Sacramento
Groundwater Master Plan
Sacramento County, California



Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sesnsitive Land Cover Type

Seasonal Wetland

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 12 and 37.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4c. Sensitive Land Cover Types in the Study Area (Well Site 13)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Seasonal Wetland

N

0 50 100

Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 13.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4d. Sensitive Land Cover Types in the Study Area (Well Site 24)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Drainage Canal

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 24.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

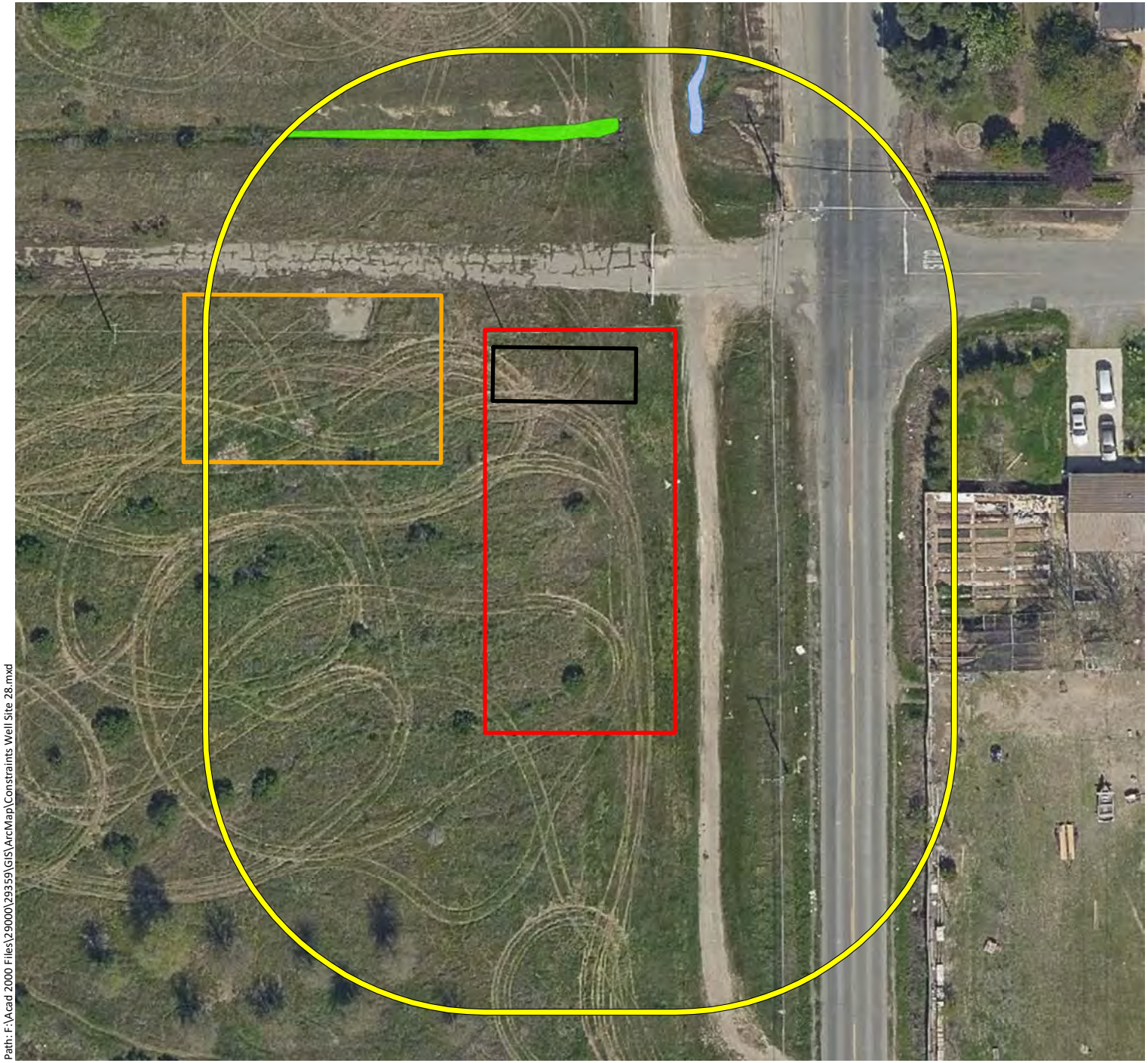


Figure 4e. Sensitive Land Cover Types in the Study Area (Well Site 28)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Ditch
Seasonal Wetland

N

0 50 100
Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 28.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Figure 4f.
Sensitive Land Cover Types in the Study Area (Well Site 29)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover Type

Seasonal Wetland

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 29.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

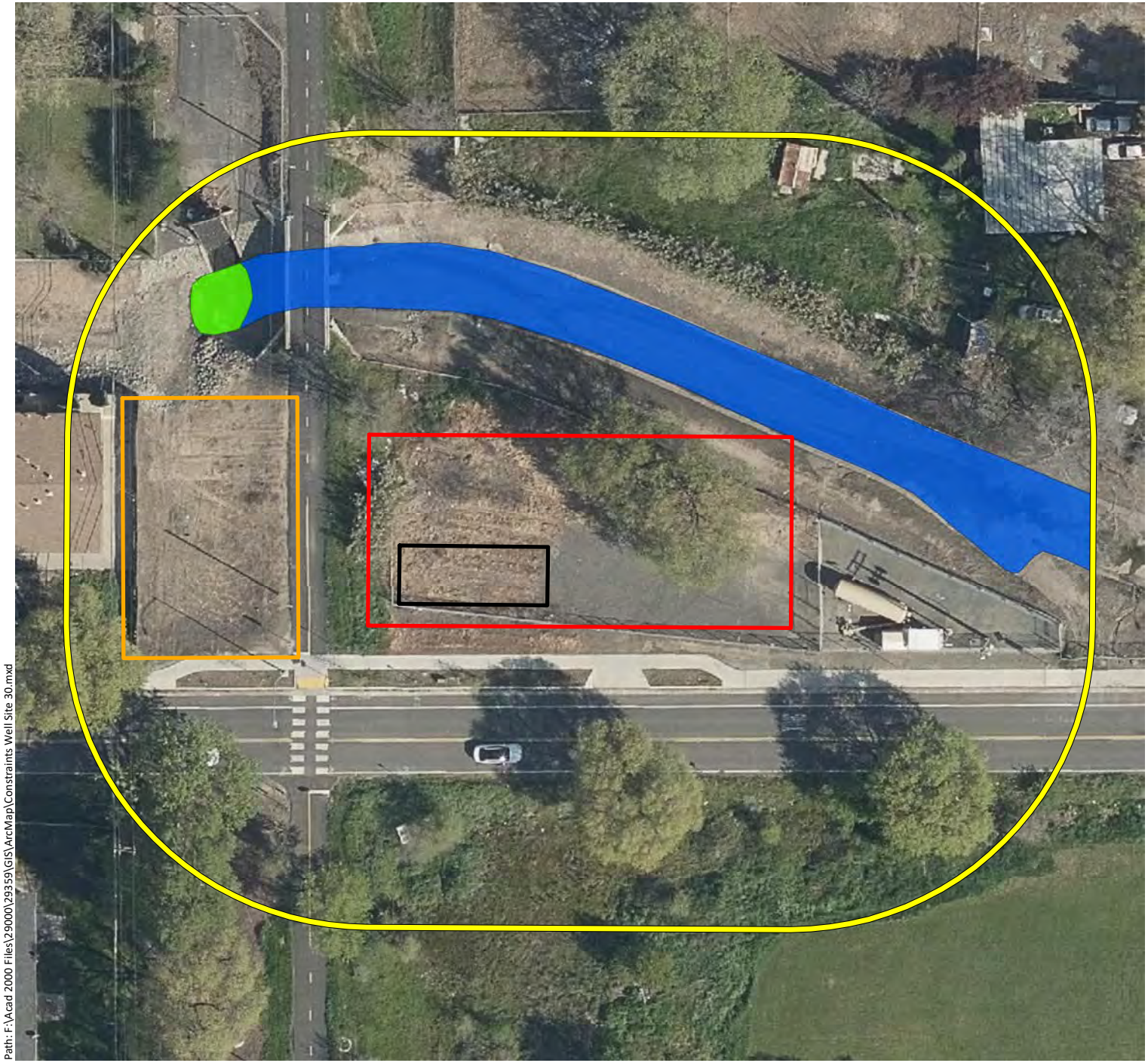


Figure 4g. Sensitive Land Cover Types in the Study Area (Well Site 30)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover

Seasonal Wetland
Drainage Canal

N

0 50 100
Feet

ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 30.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

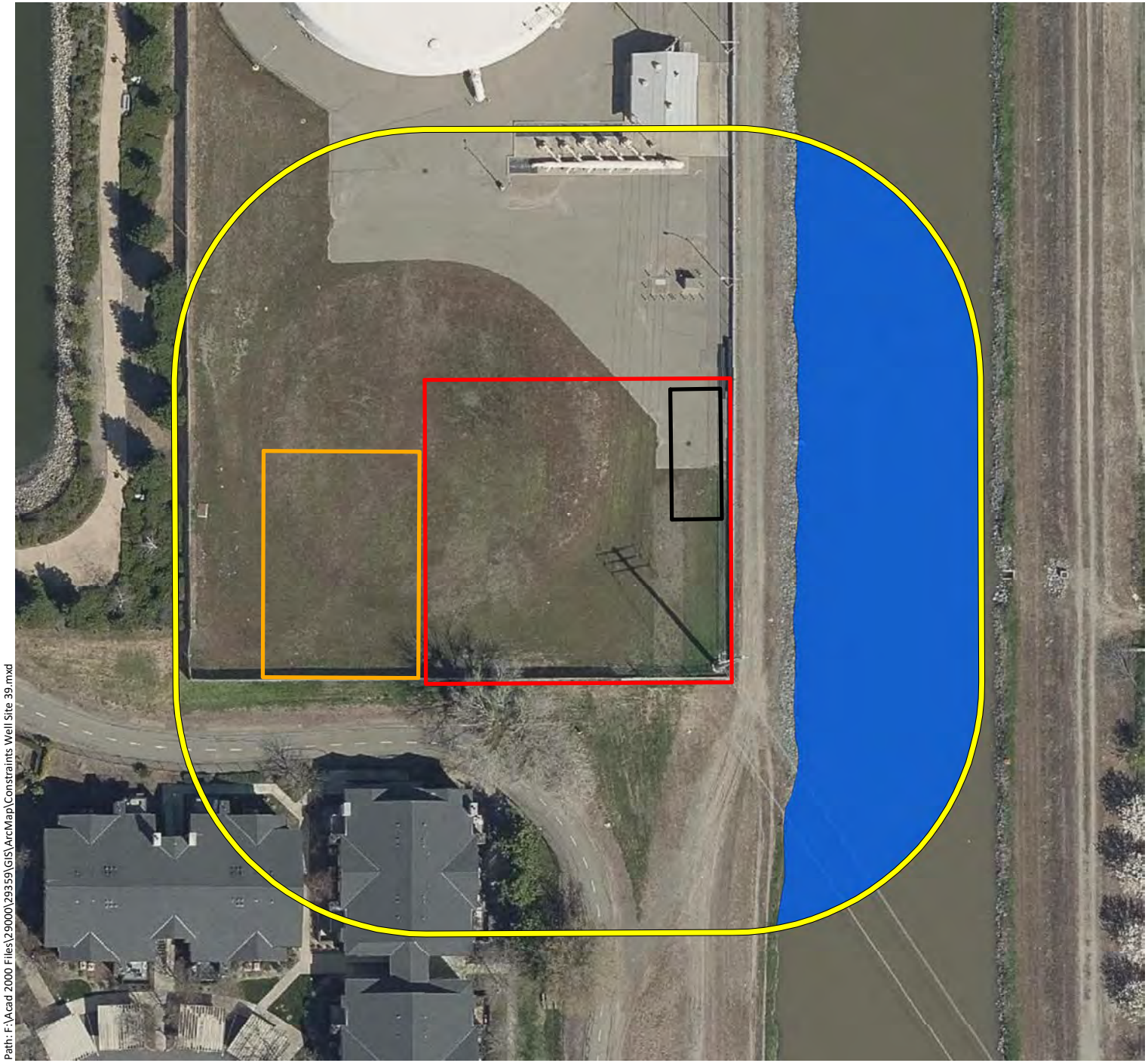


Figure 4h. Sensitive Land Cover Types in the Study Area (Well Site 39)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

Study Area
Control Building
Potential Construction Staging Area
Well Site Activity Area

Sensitive Land Cover

Drainage Canal

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: F:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 39.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 7/29/2020

Appendix B -- Observed Species

Appendix B. Plant species observed in the Study Area

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Acmispon americanus var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL
Avena barbata	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Azolla sp.	-	-	-	-	-	-
Baccharis pilularis	Coyote brush	native	shrub	-	-	-
Bromus catharticus	Rescue grass	non-native	annual, perennial grass	-	-	-
Bromus diandrus	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Bromus tectorum	Cheat grass	non-native (invasive)	annual grass	-	High	-
Centaurea solstitialis	Yellow starthistle	non-native (invasive)	annual herb	-	High	-
Centromadia fitchii	Spikeweed	native	annual herb	-	-	FACU
Cerastium glomeratum	Large mouse ears	non-native	annual herb	-	-	UPL
Chenopodium sp.	-	-	-	-	-	-
Cichorium intybus	Chicory	non-native	perennial herb	-	-	FACU
Croton setiger	Turkey-mullein	native	perennial herb	-	-	-
Cynodon dactylon	Bermuda grass	non-native (invasive)	perennial grass	-	Moderate	FACU
Cyperus eragrostis	Tall cyperus	native	perennial grasslike herb	-	-	FACW
Deschampsia danthonioides	Annual hairgrass	native	annual grass	-	-	FACW
Digitaria sp.	-	-	-	-	-	-
Dittrichia graveolens	Stinkwort	non-native (invasive)	annual herb	-	Moderate	-
Echinochloa crus-galli	Barnyard grass	non-native	annual grass	-	-	FACW
Epilobium brachycarpum	Willow herb	native	annual herb	-	-	-
Erigeron bonariensis	Flax-leaved horseweed	non-native	annual herb	-	-	FACU
Erodium botrys	Big heron bill	non-native	annual herb	-	-	FACU

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Erodium brachycarpum	White stemmed filaree	non-native	annual herb	-	-	-
Eschscholzia californica	California poppy	native	annual, perennial herb	-	-	-
Euphorbia maculata	Spotted spurge	non-native	annual herb	-	-	UPL
Euthamia occidentalis	Western goldenrod	native	perennial herb	-	-	FACW
Festuca bromoides	Brome fescue	non-native	annual grass	-	-	FACU
Festuca perennis	Italian rye grass	non-native (invasive)	annual, perennial grass	-	Moderate	FAC
Hedera helix	English ivy	non-native (invasive)	vine, shrub	-	High	FACU
Helminthotheca echioides	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC
Hirschfeldia incana	Short-podded mustard	non-native (invasive)	perennial herb	-	Moderate	-
Holocarpha virgata	Narrow tarplant	native	annual herb	-	-	-
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	non-native (invasive)	annual grass	-	Moderate	FAC
Hypochaeris radicata	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU
Juncus bufonius	Common toad rush	native	annual grasslike herb	-	-	FACW
Juncus mexicanus	Mexican rush	native	perennial grasslike herb	-	-	FACW
Kickxia elatine	Sharp point fluellin	non-native	perennial herb	-	-	UPL
Lactuca saligna	Willow lettuce	non-native	annual herb	-	-	UPL
Lactuca serriola	Prickly lettuce	non-native	annual herb	-	-	FACU
Lagerstroemia indica	crepe myrtle	non-native	tree	-	-	-
Leptochloa fusca	Sprangletop	native	annual grass	-	-	FACW
Lonicera japonica	Japanese honeysuckle	non-native	vine, shrub	-	-	FACU
Lotus corniculatus	Bird's foot trefoil	non-native	perennial herb	-	-	FAC
Ludwigia peploides	Marsh purslane	non-native (invasive)	perennial herb	-	High	OBL

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Ludwigia sp.	-	-	-	-	-	-
Lythrum hyssopifolia	Hyssop loosestrife	non-native (invasive)	annual, perennial herb	-	Limited	OBL
Malva parviflora	Cheeseweed	non-native	annual herb	-	-	-
Malva sp.	-	-	-	-	-	-
Malvella leprosa	Alkali mallow	native	perennial herb	-	-	FACU
Oxalis corniculata	Creeping wood sorrel	non-native	perennial herb	-	-	FACU
Paspalum dilatatum	Dallis grass	non-native	perennial grass	-	-	FAC
Persicaria sp.	-	-	-	-	-	-
Phalaris paradoxa	Hood canarygrass	non-native	annual grass	-	-	FAC
Phyla nodiflora	Common lippia	native	perennial herb	-	-	FACW
Pinus ponderosa	Ponderosa pine	native	tree	-	-	FACU
Pistacia chinensis	Chinese pistache	non-native	tree	-	-	-
Plantago lanceolata	Ribwort	non-native (invasive)	perennial herb	-	Limited	FAC
Plantago major	Common plantain	non-native	perennial herb	-	-	FAC
Platanus racemosa	California sycamore	native	tree	-	-	FAC
Platanus x *racemosa*	London plane	non-native	tree	-	-	-
Poa annua	Annual blue grass	non-native	annual grass	-	-	FAC
Polygonum aviculare	Prostrate knotweed	non-native	annual, perennial herb	-	-	FAC
Populus fremontii ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC
Portulaca oleracea	Common purslane	non-native	annual herb	-	-	FAC
Prunella vulgaris	Self heal	native	perennial herb	-	-	FACU
Pyracantha sp.	-	-	-	-	-	-
Quercus douglasii	Blue oak	native	tree	-	-	-
Quercus lobata	Valley oak	native	tree	-	-	FACU
Quercus suber	Cork oak	non-native	tree	-	-	-
Raphanus sativus	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-

Scientific Name	Common Name	Origin	Form	Rarity Status	CAL-IPC Status	Wetland Status (AW 2016)
Robinia pseudoacacia	Black locust	non-native (invasive)	tree	-	Limited	FACU
Rubus armeniacus	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC
Rumex crispus	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC
Salsola tragus	Russian thistle	non-native (invasive)	annual herb	-	Limited	FACU
Sambucus nigra ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC
Scleranthus annuus ssp. *annuus*	German knotgrass	non-native	annual herb	-	-	FACU
Sequoia sempervirens	Coast redwood	native	tree	-	-	-
Silybum marianum	Milk thistle	non-native (invasive)	annual, perennial herb	-	Limited	-
Sorghum halepense	Johnsongrass	non-native	perennial grass	-	-	FACU
Spergularia rubra	Purple sand spurry	non-native	annual, perennial herb	-	-	FAC
Taraxacum officinale	Red seeded dandelion	non-native	perennial herb	-	-	FACU
Tribulus terrestris	Puncture vine	non-native (invasive)	annual herb	-	Limited	-
Trifolium dubium	Shamrock	non-native	annual herb	-	-	UPL
Trifolium fragiferum	Strawberry clover	non-native	perennial herb	-	-	FAC
Trifolium repens	White clover	non-native	perennial herb	-	-	FACU
Triticum aestivum	Common wheat	non-native	annual grass	-	-	-
Veronica peregrina ssp. *xalapensis*	Speedwell	native	annual herb	-	-	FAC
Vicia sativa	Spring vetch	non-native	annual herb, vine	-	-	FACU
Vicia villosa	Hairy vetch	non-native	annual herb, vine	-	-	-

All species identified using the *Jepson Manual, 2nd Edition* (Baldwin et al. 2012) and *A Flora of Sonoma County* (Best et al. 1996); nomenclature follows *The Jepson Flora Project* (eFlora 2018) unless otherwise noted

Sp.: “species”, intended to indicate that the observer was confident in the identity of the genus but uncertain which species
Cf.: intended to indicate a species appeared to the observer to be specific, but was not identified based on diagnostic characters

[1]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2018)

FE:	Federal Endangered
FT:	Federal Threatened
SE:	State Endangered
ST:	State Threatened
SR:	State Rare
Rank 1A:	Plants presumed extirpated in California and either rare or extinct elsewhere
Rank 1B:	Plants rare, threatened, or endangered in California and elsewhere
Rank 2A:	Plants presumed extirpated in California, but more common elsewhere
Rank 2B:	Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3:	Plants about which we need more information – a review list
Rank 4:	Plants of limited distribution – a watch list

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2006)

High:	Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
Moderate:	Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance; limited- moderate distribution ecologically
Limited:	Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed:	Assessed by Cal-IPC and determined to not be an existing current threat

[3]Wetland Status: National List of Plant Species that Occur in Wetlands, Arid West Region (Lichvar et al. 2016)

OBL:	Almost always a hydrophyte, rarely in uplands
FACW:	Usually a hydrophyte, but occasionally found in uplands
FAC:	Commonly either a hydrophyte or non-hydrophyte
FACU:	Occasionally a hydrophyte, but usually found in uplands
UPL:	Rarely a hydrophyte, almost always in uplands
NL:	Rarely a hydrophyte, almost always in uplands
NI:	No information; not factored during wetland delineation

Appendix C -- Species Potential Table

Appendix C. Potential for special-status plant and wildlife species to occur in the Study Area. List compiled from the U.S. Fish and Wildlife Service (USFWS) IPaC Trust Report, Natomas Basin Habitat Conservation Plan, and a search of the California Department of Fish and Wildlife Natural Diversity Database (CDFW 2020) and the California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2020a) for the Taylor Monument, Citrus Heights, Rio Linda, Florin, Carmichael, Sacramento West, Elk Grove, Clarksburg, and Sacramento East U.S. Geological Survey 7.5' quadrangles (USGS 2018a-i). A review of historical and current satellite imagery (Google Earth 2020, Historical Aerials 2020), and a review of other CDFW and USFWS lists and publications (Shuford and Gardali 2008, Tomson et al. 2016, USFWS 2008).

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Plants				
Ferris' milk-vetch *Astragalus tener var. ferrisiae*	Rank 1B.1	Meadows and seeps (vernally mesic), valley and foothill grassland (subalkaline flats). Elevation ranges from 5 to 245 feet (2 to 75 meters). Blooms Apr-May.	**Unlikely**. The Study Area does not contain subalkaline flats or vernally mesic meadows or seeps.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
valley brodiaea *Brodiaea rosea ssp. vallicola*	Rank 4.2	Valley and foothill grassland (swales), vernal pools. Elevation ranges from 30 to 1100 feet (10 to 335 meters). Blooms Apr-May(Jun).	**Moderate Potential.** The Study Area contains grassland habitat; however vernal pools are absent.	Protocol-level survey should be conducted in May to determine presence. See Section 7.1 for further recommendations.
bristly sedge *Carex comosa*	Rank 2B.1	Coastal prairie, marshes and swamps (lake margins), valley and foothill grassland. Elevation ranges from 0 to 2050 feet (0 to 625 meters). Blooms May-Sep.	**Unlikely**. While the Study Area contains stream margins, these areas provide limited potential habitat due to disturbance. Additionally, no individuals were observed during the site visit conducted in June.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
pappose tarplant *Centromadia parryi ssp. parryi*	Rank 1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (coastal salt), valley and foothill grassland (vernally mesic). Elevation ranges from 0 to 1380 feet (0 to 420 meters). Blooms May-Nov.	**Moderate Potential**. The Study Area contains vernally mesic grasslands. Additionally, this species is known to occur in disturbed areas.	**Not Observed**. The species was not observed during the June survey and is determined absent from the Study Area.
Parry's rough tarplant *Centromadia parryi ssp. rudis*	Rank 4.2	Valley and foothill grassland, vernal pools. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms May-Oct.	**Moderate Potential**. The Study Area contains vernally mesic grasslands. Additionally, this species is known to occur in disturbed areas.	**Not Observed**. The species was not observed during the June survey and is determined absent from the Study Area.
Peruvian dodder *Cuscuta obtusiflora var. glandulosa*	Rank 2B.2	Marshes and swamps (freshwater). Elevation ranges from 45 to 920 feet (15 to 280 meters). Blooms Jul-Oct.	**Unlikely**. The Study Area does not contain freshwater marsh habitat. Additionally, no *Cuscuta* spp. was observed during the June site visit.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
dwarf downingia *Downingia pusilla*	Rank 2B.2	Valley and foothill grassland (mesic), vernal pools. Elevation ranges from 0 to 1460 feet (1 to 445 meters). Blooms Mar-May.	**Moderate Potential**. The Study Area contains mesic grasslands in isolated depressions with known associated species.	Protocol-level survey should be conducted in April to determine presence. See Section 7.1 for further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
stinkbells *Fritillaria agrestis*	Rank 4.2	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland. Elevation ranges from 30 to 5100 feet (10 to 1555 meters). Blooms Mar-Jun.	**Moderate Potential**. The Study Area contains grassland habitat; additionally, this species is known to occur in non-native grassland habitat.	Protocol-level survey should be conducted in April to determine presence. See Section 7.1 for further recommendations.
Boggs Lake hedge-hyssop *Gratiola heterosepala*	SE, Rank 1B.2, Natomas Basin HCP	Marshes and swamps (lake margins), vernal pools. Elevation ranges from 30 to 7790 feet (10 to 2375 meters). Blooms Apr-Aug.	**No Potential**. The Study Area does not contain vernal pool habitat and mesic grasslands are dominated by aggressive non-native species which likely preculdes this diminutive annual species.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.
hogwallow starfish *Hesperevax caulescens*	Rank 4.2	Valley and foothill grassland (mesic, clay), vernal pools (shallow). Elevation ranges from 0 to 1655 feet (0 to 505 meters). Blooms Mar-Jun.	**No Potential**. The Study Area does not contain vernal pool habitat and mesic grasslands are dominated by aggressive non-native species which likely preculdes this diminutive annual species.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
woolly rose-mallow *Hibiscus lasiocarpos var. occidentalis*	Rank 1B.2	Marshes and swamps (freshwater). Elevation ranges from 0 to 395 feet (0 to 120 meters). Blooms Jun-Sep.	**No Potential**. The Study Area does not contain freshwater marsh habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Ahart's dwarf rush *Juncus leiospermus var. ahartii*	Rank 1B.2	Valley and foothill grassland (mesic). Elevation ranges from 95 to 750 feet (30 to 229 meters). Blooms Mar-May.	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	Rank 1B.2, Natomas Basin HCP	Marshes and swamps (freshwater and brackish). Elevation ranges from 0 to 15 feet (0 to 5 meters). Blooms May-Jul (Aug-Sep).	**No Potential.** The Study Area does not contain marsh habitat.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.
legenere *Legenere limosa*	Rank 1B.1, Natomas Basin HCP	Vernal pools. Elevation ranges from 0 to 2885 feet (1 to 880 meters). Blooms Apr-Jun.	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Heckard's pepper-grass *Lepidium latipes var. heckardii*	Rank 1B.2	Valley and foothill grassland (alkaline flats). Elevation ranges from 5 to 655 feet (2 to 200 meters). Blooms Mar-May.	**Unlikely**. The Study Area does not contain alkaline flats.	**Not Present.** The Study Area does not contain suitable habitat for this species. No further recommendations.
Mason's lilaeopsis *Lilaeopsis masonii*	SR, Rank 1B.1	Marshes and swamps (brackish or freshwater), riparian scrub. Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Apr-Nov.	**No Potential**. The Study Area does not contain tidal zones along streams.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
hoary navarretia *Navarretia eriocephala*	Rank 4.3	Cismontane woodland, valley and foothill grassland. Elevation ranges from 340 to 1310 feet (105 to 400 meters). Blooms May-Jun.	**Moderate Potential**. The Study Area contains mesic grassland habitat.	Protocol-level survey should be conducted in May to determine presence. See Section 7.1 for further recommendations.
Colusa grass *Neostapfia colusana*	FT, CE, Rank 1B.1, Natomas Basin HCP	Vernal pools (large on adobe soil). Elevation ranges from 15 to 600 feet (5 to 200 meters) Blooms May-Aug.	**No Potential.** The Study Area does not contain vernal pool habitat. Additionally, the species was not observed during the June survey.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
slender Orcutt grass *Orcuttia tenuis*	FT, SE, Rank 1B.1, Natomas Basin HCP	Vernal pools. Elevation ranges from 110 to 5775 feet (35 to 1760 meters). Blooms May-Sep(Oct).	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Sacramento Orcutt grass *Orcuttia viscida*	FE, SE, Rank 1B.1, Natomas Basin HCP	Vernal pools. Elevation ranges from 95 to 330 feet (30 to 100 meters). Blooms Apr-Jul(Sep).	**No Potential**. The Study Area does not contain vernal pool habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Sanford's arrowhead *Sagittaria sanfordii*	Rank 1B.2, Natomas Basin HCP	Marshes and swamps (assorted shallow freshwater). Elevation ranges from 0 to 2135 feet (0 to 650 meters). Blooms May-Oct(Nov).	**No Potential**. The Study Area does not contain ponds or marsh habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
Suisun Marsh aster *Symphyotrichum lentum*	Rank 1B.2	Marshes and swamps (brackish and freshwater). Elevation ranges from 0 to 10 feet (0 to 3 meters). Blooms (Apr)May-Nov.	**No Potential**. The Study Area does not contain slough habitat.	**Not Present**. The Study Area does not contain suitable habitat for this species. No further recommendations.
saline clover *Trifolium hydrophilum*	Rank 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr-Jun.	**Moderate Potential**. The Study Area contains vernally mesic grasslands with known associated species. However, no individuals were observed during the June site visit.	Protocol-level survey should be conducted in April to determine presence. See Section 7.1 for further recommendations.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Mammals				
ringtail (ring-tailed cat) *Bassariscus astutus*	CFP	Is widely distributed throughout most of California, but absent from some portions of the Central Valley and northeastern California. The species is nocturnal, primarily carnivorous and is associated with a mixture of dry forest and shrubland in close association with rocky areas and riparian habitat, using hollow trees and cavities for shelter.	**No Potential.** The Study Area and adjacent areas do not contain forest, shrubland, or riparian habitats to support this species.	No further actions are recommended for this species.
American badger *Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	**Unlikely.** Ruderal herbaceous areas within the Study Area has been regularly disked and/or lacks connectivity to expansive habitats.	No further actions are recommended for this species.
pallid bat *Antrozous pallidus*	SSC, WBWG High	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include crevices in rocky outcrops and cliffs, caves, mines, trees and various human structures such as bridges, barns, and human-occupied as well as vacant buildings. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	**Moderate Potential.** This species may occasionally fly over the Study Area and may occasionally roost in the Study Area, but there are no trees that would support maternity roosts.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
western red bat *Lasiurus blossevillii*	SSC, WBWG High	This species is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores).	**Moderate Potential.** This species may occasionally fly over the Study Area and may occasionally roost in the Study Area, but there are no trees that would support maternity roosts.	No further actions are recommended for this species.
Birds				
golden eagle *Aquila chrysaetos*	CFP, BGEPA	Resident in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees in open areas.	**Unlikely.** Individuals may occasionally fly over the Study Area, but the Study Area does not contain any trees to support nesting and is surrounded by development, reducing the likelihood this species may even forage there.	No further actions are recommended for this species.
bald eagle *Haliaeetus leucocephalus*	SE, CFP, BGEPA	Occurs year-round in California, but primarily a winter visitor. Nests in large trees in the vicinity of larger lakes, reservoirs and rivers. Wintering habitat somewhat more variable but usually features large concentrations of waterfowl or fish.	**Unlikely.** The Study Area and surrounding areas do not contain large bodies of water to support foraging or trees near water to support nesting. This species may occasionally fly over the Study Area.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Swainson's hawk *Buteo swainsonii*	ST	Summer resident in the region. Forages in grasslands and nests in the immediate vicinity, often in relatively isolated, trees or tree groves. Most of the California population breeds in the Central Valley. Forages on insects and rodents, also other vertebrates.	**Moderate Potential.** Swainson's hawk have been documented to nest in proximity to the Study Area and several of the Project Areas contain trees that could be suitable for nesting Swainson's hawk.	Protocol level surveys are recommended if activities would occur in the breeding season. See Section 7 of the text for further details.
northern harrier *Circus cyaneus*	SSC	Nests and forages in grassland habitats, usually in association with coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas. May also occur in alkali desert sinks.	**Unlikely.** The Study Area does not contain freshwater marshes with shrubby vegetation.	No further actions are recommended for this species.
white-tailed kite *Elanus leucurus*	CFP	Year-round resident in coastal and valley lowlands with scattered trees and large shrubs, including grasslands, marshes and agricultural areas. Nests in trees, of which the type and setting are highly variable. Preys on small mammals and other vertebrates.	**Moderate Potential.** The Study Area does contain trees or shrubs suitable for nesting.	Surveys for nesting white-tailed kite are recommended for sites with trees and shrubs if activities would occur in the breeding season. See Section 7 of the text for further details.
burrowing owl *Athene cunicularia*	SSC	Inhabits, dry annual or perennial grassland, desert and scrubland characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably California ground squirrel.	**Moderate Potential.** Some of the Well Sites contain burrows or burrow analogues that could support burrowing owl.	Preconstruction surveys are recommended or required. See Section 7 of the text for further details.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
short-eared owl *Asio flammeus*	SSC	Occurs year-round, but primarily as a winter visitor; breeding very restricted in most of California. Found in open, treeless areas (e.g., marshes, grasslands) with elevated sites for foraging perches and dense herbaceous vegetation for roosting and nesting. Preys mostly on small mammals, particularly voles.	**Unlikely.** The Study Area and adjacent areas do not contain marshes to support nesting for this species, and because the Study Area is surrounded by development the quality of the foraging habitat is diminished.	No further actions are recommended for this species.
long-eared owl *Asio otus*	SSC	Occurs year-round in California. Nests in trees in a variety of woodland habitats, including oak and riparian, as well as tree groves. Requires adjacent open land with rodents for foraging, and the presence of old nests of larger birds (hawks, crows, magpies) for breeding.	**Unlikely.** The Study Area and adjacent areas do not contain woodland or mature riparian habitats to support nesting for this species, and because the Study Area is surrounded by development, the quality of the foraging habitat is diminished.	No further actions are recommended for this species.
purple martin *Progne subis*	SSC	Inhabits woodlands and low elevation coniferous forests. Nests in old woodpecker cavities and human-made structures. Nest is often located in tall, isolated tree or snag.	**Unlikely.** The Study Area and adjacent areas do not contain woodland, forest, or human-made structures to support nesting for this species. This species may occasionally fly over or forage in the Study Area.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
bank swallow *Riparia riparia*	ST	Migrant in riparian and other lowland habitats in western California. Colonial nester in riparian areas with vertical cliffs and bands with fine-textured or fine-textured sandy soils near streams, rivers, lakes or the ocean. Historical range in southern and central areas of California has been eliminated by loss of nesting habitat due to flood and erosion-control projects, but currently is known to breed in Siskiyou, Shasta, and Lassen Cos., and along Sacramento River from Shasta Co. south to Yolo Co.	**Unlikely.** The Study Area and adjacent areas do not contain cliffs or riparian habitats necessary to support nesting for this species. This species may occasionally forage or fly over the Study Area.	No further actions are recommended for this species.
loggerhead shrike *Lanius ludovicianus*	SSC	Found in broken woodlands, savannah, pinyon-juniper, Joshua tree and riparian woodlands, and desert oases, scrub, and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	**Unlikely.** Although the Study Area contains limited potential foraging habitat for this species, it the Well Sites are limited in size and are mostly embedded in an urban setting.	No further actions are recommended for this species.
California black rail *Laterallus jamaicensis coturniculus*	ST, CFP	Year-round resident in marshes (saline to freshwater) with dense vegetation within four inches of the ground. Prefers larger, undisturbed marshes that have an extensive upper zone and are close to a major water source. Extremely secretive and cryptic.	**Unlikely.** The Study Area does not contain marsh habitat to support this species.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
least bell's vireo *Vireo bellii pusillus*	FE, SE	Summer resident. Breeds in riparian habitat along perennial or intermittent rivers and creeks; prefers a multi-tiered canopy with dense early successional vegetation in the understory. Willows, mulefat and other understory species are typically used for nesting.	**No Potential.** The Study Area and adjacent areas do not contain contiguous riparian habitat to support this species, and the regional documented occurrences of this species in vicinity the past 100 years are west of the Study Area in the Yolo Bypass Wildlife Refuge (eBird 2020, CDFW 2020).	No further actions are recommended for this species.
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FT, SE	Summer resident, breeding in dense riparian forests and jungles, typically with early successional vegetation present. Utilizes densely foliaged deciduous trees and shrubs. Eats mostly caterpillars. Current breeding distribution within California very restricted.	**No Potential.** The Study Area does not contain dense riparian forest to support this species.	No further actions are recommended for this species.
yellow-breasted chat *Icteria virens*	SSC	Summer resident, occurring in riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	**Unlikely.** The Study Area does not contain riparian environments to support nesting for this species. This species may occasionally fly over the Study Area, but it will not nest there.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
tricolored blackbird *Agelaius tricolor*	ST, SSC	Usually nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs. Nesting area must be large enough to support about 50 pairs.	**Unlikely.** The Study Area does not contain and is not adjacent to wetlands with dense emergent vegetation to support nesting for this species. This species may occasionally fly over the Study Area, but it will not nest there.	No further actions are recommended for this species.
grasshopper sparrow *Ammodramus savannarum*	SSC	Summer resident in the region. Breeds in open grassland habitats, generally with low- to moderate-height grasses and scattered shrubs.	**Unlikely.** The Study Area does not contain open grasslands in their natural state that would support nesting grasshopper sparrows.	No further actions are recommended for this species.
song sparrow (Modesto Population) *Melospiza melodia*	SSC	Restricted to the Sacramento and extreme northern San Joaquin Valleys from Colusa County south to Stanislaus County. Associated with woody riparian habitat and freshwater marshes.	**Unlikely.** The Study Area does not contain riparian or wetland habitat with emergent vegetation to the extent needed to support this species.	No further actions are recommended for this species.
Reptiles and Amphibians				
western spadefoot *Spea (=Scaphiopus) hammondii*	SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Shallow temporary pools formed by winter rains are essential for breeding and egg-laying.	**Unlikely.** The Well Sites are nearly all located in an urban setting surrounded by roads. Furthermore, they are managed by mowing or disking.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
California red-legged frog *Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to estivation habitat.	**No Potential.** California red-legged frog is considered extirpated in the region. There are no documented occurrences of this species within 5 miles of the Study Area (CDFW 2020).	No further actions are recommended for this species.
California tiger salamander *Ambystoma californiense*	FT, ST	Populations in Santa Barbara and Sonoma Counties are currently listed as endangered, and the Central Valley populations are listed as threatened. Inhabits grassland, oak woodland, ruderal and seasonal pool habitats. Seasonal ponds and vernal pools are crucial to breeding. Adults utilize mammal burrows as estivation habitat.	**No Potential.** This species generally does not occur north of the American River. There are no documented occurrences of this species near the Study Area (CDFW 2020).	No further actions are recommended for this species.
giant garter snake *Thamnophis gigas*	FT, ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	**Unlikely.** The Study Area does not contain suitable habitat (upland and aquatic habitat without barriers between them) to support this species.	Because one of the sites is located near an extant population in the NBHCP area, some preconstruction surveys for that Project Area may be required. See Section 7 of the text for more information.
western pond turtle *Actinemys marmorata*	SSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	**Unlikely.** The majority of the Study Area does not contain aquatic habitat to support turtles and the Well Sites are in an urban setting and do not have connectivity to potentially occupied areas.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Fishes				
longfin smelt *Spirinchus thaleichthys*	FC, ST	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Sacramento perch *Archoplites interruptus*	SSC	Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley. Prefer warm water. Aquatic vegetation is essential for young. Tolerate wide range of physio-chemical water conditions.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Sacramento splittail *Pogonichthys macrolepidotus*	SSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Sacramento Delta, Suisun Bay and associated marshes. Occurs in slow-moving river sections and dead end sloughs. Requires flooded vegetation for spawning and foraging for young. Splittail are primarily freshwater fish, but are tolerant of moderate salinity and can live in water where salinity levels reach of 10-18 parts per thousand.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
Chinook salmon - central valley spring-run ESU *Oncorhynchus tshawytscha*	FT, ST	Occurs in the Feather River and the Sacramento River and its tributaries, including Butte, Mill, Deer, Antelope and Beegum Creeks. Adults enter the Sacramento River from late March through September. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams from mid-August through early October. Juveniles migrate soon after emergence as young-of-the-year, or remain in freshwater and migrate as yearlings.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Chinook salmon – Sacramento winter-run ESU *Oncorhynchus tshawytscha*	FE, SE	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 6 and 14 degrees C for spawning. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles typically migrate to the ocean soon after emergence from the gravel.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
steelhead - central valley DPS *Oncorhynchus mykiss irideus*	FT	The Central Valley ESU includes all naturally spawned populations (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo bays and their tributaries. Preferred spawning habitat for steelhead is in cool to cold perennial streams with high dissolved oxygen levels and fast flowing water. Abundant riffle areas for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding.	**No Potential.** The Study Area does not contain any aquatic environments to support fish.	No further actions are recommended for this species.
Invertebrates				
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Occurs only in the central valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberry 2 to 8 inches in diameter; some preference shown for "stressed" elderberry.	**Moderate Potential.** *Sambucus* plants were observed during the June 2020 site visits, but only at a few sites.	Surveys to establish absence of Valley elderberry longhorn beetle are recommended and described in section 7.
vernal pool fairy shrimp *Branchinecta lynchi*	FT	Endemic to the grasslands of the Central Valley, central coast mountains, and south coast mountains, in astatic rain-filled pools. Inhabits small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	**Moderate Potential.** Wetlands that may have potential to support vernal pool fairy shrimp were identified at some sites.	Avoidance of potentially occupied wetlands or protocol surveys to establish absence of the species are recommended. See section 7 for more details.

SPECIES	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE	RECOMMENDATIONS
vernal pool tadpole shrimp *Lepidurus packardi*	FE	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	**No Potential.** The Study Area does not contain vernal pools or other seasonal pools with inundation periods sufficient to support this species.	No further actions are recommended for this species.

*** Key to status codes:**

FE	Federal Endangered
FT	Federal Threatened
FC	Federal Candidate
SE	State Endangered
ST	State Threatened
SC	State Candidate
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group (High or Medium) Priority
BGEPA	Bald and Golden Eagle Protection Act
Rank 1A	CRPR Rank 1A: Presumed extirpated in California and either rare or extinct elsewhere
Rank 1B	CRPR Rank 1B: Plants rare, threatened or endangered in California and elsewhere
Rank 2B	CRPR Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 3	CRPR Rank 3: Plants about which CNPS needs more information (a review list)
Rank 4	CRPR Rank 4: Plants of limited distribution – a watch list

Appendix D -- Photos

Photo 1. Seasonal wetland located at Well 2.

Photo 2. Ephemeral ditch located at Well 2.

Photo 3. Artificial pond located at Well 35.

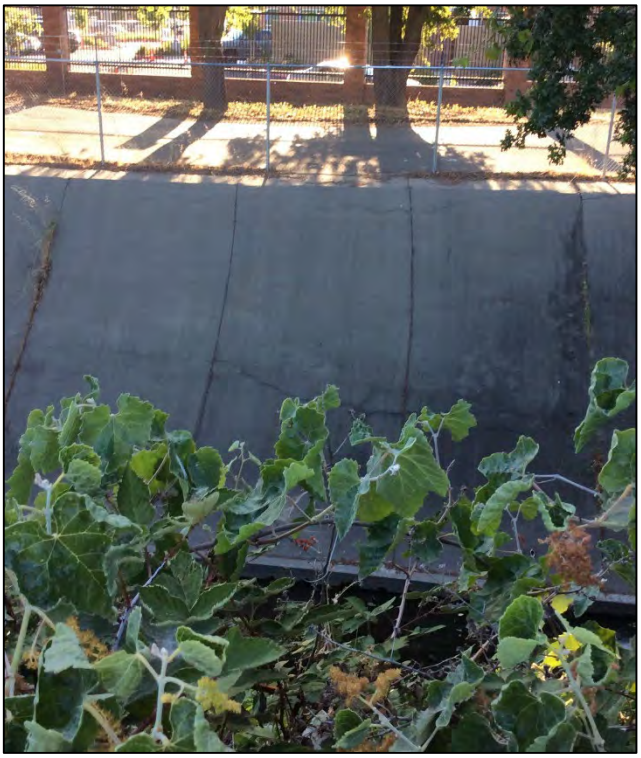


Photo 4. Drainage canal at Well 24.

Photo 5. One of the potential wetlands located at Well 37.

Photo 6. Drainage canal located at Well 39.

Photo 7. Drainage canal located at Well 15.

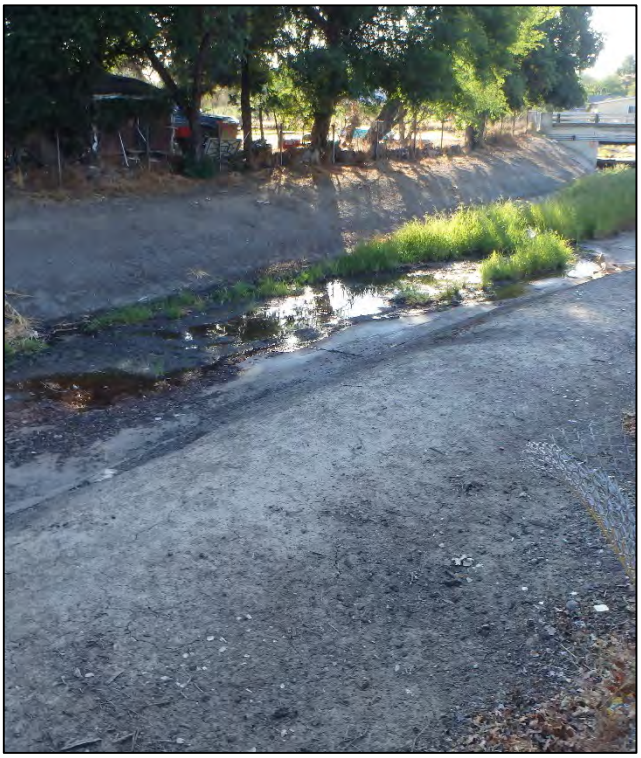


Photo 8. Drainage canal located at Well 30.

Photo 9. Wetland located in drainage canal at Well 30.

Photo 10. Potential wetland located at Well 29.

Photo 11. Example of potential bat tree. This tree is located at Well 27.

Photo 12. Example of landscape areas within the Study Area. Each of the trees are also considered a City Tree.

Photo 13. Example of non-native grassland within the Study Area.

Photo 14. Example of developed areas within the Study Area.

Photo 15. Example of non-native grassland within the Study Area.

Photo 16. Example of potential Burrowing owl habitat. This photograph is taken at Well 7.

June 7, 2022

Jennifer Ziv
Senior Project Manager
Woodward & Curran

RE: Replacement Well #38 Biological Constraints

Dear Ms. Ziv,

The purpose of this letter is to describe the results of a biological evaluation on existing conditions, potential impacts, and mitigation measures of the new Well #38 location and its immediate vicinity (Study Area). The new Well #38 location is located at a different area but remains at the EA Fairbairn water treatment plant located at 2855 E.A. Fairbairn, Sacramento, California.

This letter is an addendum to the *Biological Resources Technical Report for City of Sacramento Groundwater Master Plan* (WRA 2020). Project description and purpose, regulatory background and methods described in the 2020 report apply to this evaluation.

ECOLOGICAL SETTING

The Study Area is underlain by Rossmoor-Urban land complex, 0 to 2 percent slopes and Xerofluvents, 0 to 2 percent slope (USDA 1993; CSRL 2020). The topography of the Study Are is flat with elevations ranging from 30 to 42 feet. Local watershed is Lake Greenhaven-Sacramento River (HUC 12: 18020163070) and the regional watershed is Lower Sacramento River (HUC 8: 18020163). No mapped resources in the National Wetlands Inventory (NWI; USFWS 2022a) and California Aquatic Resources Inventory (CARI; SFEI 2022) are situated in the Study Area. The Study Area is maintained vegetation of City infrastructure dominated by non-native plants. Detailed plant community descriptions are provided below. Surrounding land use is industrial and recreational. Historically, the Study Area was developed for agriculture (Historical Aerials 2022).

RESULTS

Vegetation Communities and Other Land Cover

WRA observed two land cover types within the Study Area: developed and landscaped. Each land cover type is non-sensitive. No aquatic resources were observed in the Study Area. Photographs of the Study Area and surrounding land are included in Attachment 2.

TABLE 1. LAND COVER TYPES WITHIN THE STUDY AREA

COMMUNITY/LAND COVERS	SENSITIVE STATUS	RARITY RANKING
Developed	Non-Sensitive	N/A
Landscaped Area	Non-Sensitive	N/A

Terrestrial Land Cover

Developed Area (no vegetation alliance). CDFW Rank: None. Developed areas are paved or have structures. If planted trees are immediately adjacent to the paved areas, these are included within developed areas. Developed areas include parking lots, access roads and structures within the Study Area. Vegetation in developed areas includes planted native and non-native trees. Generally, the trees are young and small with little to somewhat developed canopy.

Landscaped Area (no vegetation alliance). CDFW Rank: None. Landscape areas are dominated by vegetation which is regularly maintained. Vegetation within the landscaped areas include mowed fields of turf grasses dominated by Bermuda grass (*Cynodon dactylon*), dallis grass (*Paspalum dilatatum*), and bluegrass (*Poa* spp.). Associated species include white clover (*Trifolium repens*), brome fescue (*Festuca bromoides*), and ribwort (*Plantago lanceolata*). Landscaped areas also include planted and/or natural stands of native and non-native trees. Native trees observed included valley oak (*Quercus lobata*), coast redwood (*Sequoia sempervirens*) and interior live oak (*Quercus wislizenii*). The trees ranged from saplings to mature. Non-native trees observed in landscaped areas included but are not limited to black locust (*Robinia pseudoacacia*), magnolia (*Magnolia grandiflora*), and London plane (*Platanus* x *racemosa*).

Aquatic Resources

No aquatic resources were observed in the Study Area.

Special-Status Species

Special-Status Plants

Based upon the 2022 review of the resource databases listed in the 2020 report, only one new special-status plant has been documented in the vicinity of the Study Area: alkali-sink goldfields (*Lasthenia chrysantha*; CRPR 1B). This species occurs in vernal pool habitat underlain by alkaline soils, blooming February through April. Habitat for this species is not present in the Study Area and has an unlikely potential to occur. Attachment 1 contains list of special-status species documented within the vicinity of the Study Area.

All of the special-status species documented from the greater vicinity are unlikely or have no potential to occur for one or more of the following:

- Hydrologic conditions (e.g., perennial wetlands, vernal pools) necessary to support the special-status plant species are not present in the Study Area;
- Edaphic (soil) conditions (e.g., alkaline soils) necessary to support the special-status plant species are not present in the Study Area;
- Associated natural communities (e.g., perennial marsh, vernal pool) necessary to support the special-status plant species are not present in the Study Area;
- The Study Area is geographically isolated by surrounding development from the documented range of the special-status plant species;

- The historical landscape and/or habitat(s) of the Study Area were not suitable habitat prior to land/type conversion to support the special-status plant species;

- Land use history and contemporary management (e.g., grading, mowing, pesticide use) has degraded the localized habitat necessary to support the special-status plant species.

Special-Status Wildlife, Wildlife Corridors, and Wildlife Nursery Sites

Based upon the 2022 review of the resource databases listed in the 2020 report no new special-status wildlife species have been documented in the vicinity of the Well Site. Potentially suitable habitat for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*) exists near the Study Area. The Study Area has potential to support one or more species of nesting bird. Swainson's hawk (SWHA; *Buteo swainsoni*) and white-tailed kite (*Elanus leucurus)* has potential to nest in the Study Area and its vicinity. Trees have potential to support day roosting bats where present, however trees in the Well Site #38 are not large enough to support maternity roosts for bats. No buildings or trees that would support bat roosts would be removed or demolished as part of the Project.

Of the special-status wildlife species documented in the vicinity of the Study Area, most are excluded from the majority of the Study Area based on a lack of habitat features and the position of the Study Area in an urban environment that precludes access to the majority of the individual Well Sites. Features not found within the Study Area that are required to support special-status wildlife species include:

- Suitable perennial aquatic habitat (e.g. streams, rivers or ponds) with suitable surrounding upland habitat (e.g. areas with animal burrows)
- Tidal Marsh areas
- Caves, mine shafts, or abandoned buildings
- Open grasslands
- Cut banks, riparian jungles, extensive emergent vegetation etc. to support nesting

The absence of such habitat features eliminates components critical to the survival or movement of most special-status species found in the vicinity.

Three special-status wildlife species have potential to occur in the immediate vicinity of or in portions of the Study Area: Valley elderberry longhorn beetle, white-tailed kite, and Swainson's hawk.

Native birds protected under the MBTA and CFGC may nest within the Study Area during nesting season (February 1 – August 31). Swainson's hawk and burrowing owl are unlikely to nest within the majority of the Study Area, but may nest within 0.25 mile of the Study Area and a few sites may support nesting. Species not documented in the close vicinity of the Study Area and determined to be unlikely or have no potential to occur there are not discussed further. A brief description of each of the wildlife species with potential to be impacted by activities in the Study Area is provided below.

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*), Federal Threatened Species. Moderate Potential. This beetle is found throughout the Central Valley in elderberry (*Sambucus sp*.) shrubs, on which it is completely dependent for larval development, and to a lesser degree, adult feeding. Typical habitat is characterized as large stands of mature elderberry shrubs in riparian or floodplain areas. *Sambucus* was found near the Study Area, immediately adjacent to the potential construction staging area. Plants were not found to contain evidence of VELB. However, where *Sambucus* is present, VELB may be present.

Swainson's hawk (*Buteo swainsoni*). State Threatened. Moderate Potential. Swainson's hawk is a summer resident and migrant in California's Central Valley and scattered portions of the southern California interior. Areas typically used for nesting include the edges of narrow bands of riparian vegetation, isolated patches of oak woodland, lone trees, and also planted and natural trees associated with roads, farmyards, and sometimes adjacent residential areas. Foraging occurs in open habitats including grasslands, open woodlands, and agricultural areas. Swainson's hawk is not uncommon in the lower Sacramento Valley in locations where nest trees and foraging habitat are present.

There are trees within and/or adjacent to the Study Area that could support nesting by Swainson's hawk and documented occurrences are present near the Study Area and prevalent in the Sacramento area. The Study Area is within foraging distance of suitable feeding areas. The foraging quality in the Study Area itself is unsuitable due to the majority of it being developed and managed.

Local Policies and Ordinances

Several large coast redwoods and magnolias that have a DSH greater than 4 inches and meet the definition of "City Tree" are located within the Study Area. One magnolia and one coast redwood are located within the well site activity area.

Habitat Conservation Plans

The Study Area is not located within an area under a habitat conservation plan.

IMPACTS AND MITIGATION EVALUATION

Using the CEQA analysis methodology outlined in the 2020 report, the following section describes potential significant impacts to sensitive resources within the Well Site Study Area as well as suggested mitigation measures which are expected to reduce impacts to less than significant. Table 2 indicates the potential constraints that may be present at the new Well Site 38. Impacts and mitigation measures described in this addendum follow the enumeration used in the 2020 report to allow for ease of programmatic use. As such, some numbers are not included herein because they do not apply to Well Site 38. Table 2 summarizes those biological resources evaluated as having potential to be impacted.

TABLE 2. POTENTIAL SENSITIVE LAND COVER TYPES, CITY TREES, AND SPECIAL-STATUS SPECIES

Well Site	Rare Plants	Wetlands	Ephemeral Ditches and/or Canals	Nesting and Special-status Birds	Giant Garter Snake	Vernal Pool Fairy Shrimp	Valley Elderberry Longhorn Beetle	Natomas Basin HCP	City Trees
38				YES			YES		YES

Special-Status Species and Nesting Birds

This section analyzes the Project's potential impacts and mitigation for special-status species in reference to the significance threshold outlined in CEQA Appendix G, Part IV (a):

Does the project have the potential to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Potential impacts and mitigation for potentially significant impacts are discussed below.

Special-Status Plant Species

No special-status plants have the potential to occur in the Study Area or be impacted by the Project.

Swainson's Hawk

Swainson's hawk is a CESA-listed raptor that regularly nests in the vicinity of the Study Area. No permanent loss of SWHA habitat is anticipated due to the Proposed Project. It is anticipated that in Well Sites where potential foraging habitat is present, this habitat will remain at approximately the same extent and quality after the Project. During construction of the Project, some areas may be temporarily disturbed and SWHA may avoid the active construction areas at that time. No nesting trees for SWHA would be removed for the Project. If SWHA nests near a Well Site and construction activities are sufficient to disturb the active nest to the extent that the active nest was abandoned, this abandonment would be considered "take" under CESA. If no impact avoidance or minimization measures are implemented, direct mortality to dependent young could occur to individual SWHA present in these areas during construction. Because SWHA are listed as threatened under CESA, take of individuals is considered a **significant impact** under CEQA.

Potential Impact BIO-2: The Proposed Project's construction activities in the Well Sites could result in take of State-threatened SWHA, which would be considered a significant impact.

To reduce potential impacts to SWHA to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure BIO-2a: Initial ground disturbing activities will commence outside of the SWHA nesting season (March 1- September 15).

or

Mitigation Measure BIO-2b: If initial ground disturbing activities will commence during the SWHA nesting season (March 1- September 15), surveys based on CDFW's survey protocol shall be conducted. These surveys will include a pre-arrival assessment conducted between January 1 and March 1, to identify areas with suitable nesting sites within 0.25 miles of the Well Sites that will have activity in that year. Surveys will be conducted for SWHA nesting during the nest-building period (April 1-April 30) if work will begin between April 1 and May 30). For activities that will commence after June 1, surveys for active nests will be conducted between June 1 and August 1. Any active nests shall be avoided at a distance sufficient to ensure that nest abandonment will not occur and this distance shall be determined through observation of the nest by a qualified

biologist. Avoidance shall be maintained until dependent young are no longer present. Survey radius for these surveys shall be 0.25 miles for this site.

Valley elderberry longhorn beetle

The Project may affect VELB if present during Project development. Potential impacts to VELB could occur during the removal of its host plant, *Sambucus,* if occupied by VELB eggs, larvae or adult life stages. Because VELB are a Federal-threatened species, take of a VELB is a **significant impact** under CEQA.

> **Potential Impact BIO-4:** The Proposed Project's construction activities in the Well Sites could result in take of Federal-threatened VELB, which would be considered a significant impact.
>
> To reduce potential impacts to VELB to a less-than-significant level, the following measures shall be implemented:
>
> **Mitigation Measure BIO-4:** Prior to initial ground disturbance, a survey for the valley elderberry longhorn beetle (VELB) host plant, *Sambucus*, will be conducted. *Sambucus* plants, if detected, shall be avoided by at least 20 feet from the dripline of the plant and this avoidance buffer shall be clearly demarcated using lathe and flagging. If *Sambucus* plants with a stem diameter of greater than 1 inch cannot be avoided, they shall be inspected for evidence of VELB presence and if any evidence of VELB is detected, the plants shall be avoided and consultation with the USFWS shall occur to determine next steps, which may include relocation of the plant.

Common Nesting Birds and White-tailed Kite

The Project may affect non-special-status native birds that are protected by the CFGC and white-tailed kite. Potential impacts to these species and their habitats could occur during the removal of vegetation or during ground-disturbing activities. These activities could result in the direct removal or destruction of active nests or may create audible, vibratory, and/or visual disturbances that cause birds to abandon active nests. Because nesting birds are protected by CFGC and white-tailed kite is a fully protected species, destruction of an active nest or mortality of dependent young would be considered a **significant impact** under CEQA.

> **Potential Impact Bio-6**: The Proposed Project may directly or indirectly impact nesting birds, including special-status species.

To reduce impacts to nesting birds to less than significant level, the following measures shall be implemented:

> **Mitigation Measure Bio-6:** A survey for active bird nests at all sites shall be conducted by a qualified biologist no more than 14 days prior to the start of Project activities (vegetation removal, grading, or other initial ground-disturbing activities) if ground disturbing activities commence during the nesting season (February 1 through August 31). The survey shall be conducted in a sufficient area around the Well Site to identify the location and status of any nests that could potentially be directly or indirectly affected by vegetation removal, or grading activities. For white-tailed kite, the survey area shall

extend at least 0.25 miles from the area of potential disturbance. Based on the results of the pre-construction breeding bird survey, the following measure shall apply:

- If active nests are found within the Well Site, or close enough to the area to affect nesting success, a work exclusion zone shall be established around each nest. Established exclusion zones shall remain in place until all young in the nest have fledged or the nest otherwise becomes inactive (e.g. due to predation). Appropriate exclusion zone sizes shall be established by a qualified biologist. Sizes of exclusion zones vary dependent upon bird species, nest location, existing visual buffers, ambient sound levels, and other factors; an exclusion zone radius may be as small as 25 feet (for common, disturbance-adapted species) or more than 250 feet for raptors. Listed species are typically provided more extensive exclusion zones, which may be specific to the species and/or follow CDFW guidance. Exclusion zone size may also be reduced from established levels if supported with nest monitoring by a qualified biologist indicating that work activities are not adversely impacting the nest

Sensitive Land Cover Types and Aquatic Resources

No sensitive land cover types or aquatic resources are present within the Study Area.

Wildlife Corridors and Native Wildlife Nursery Sites

This section analyzes the Project's potential impacts and mitigation for habitat corridors and linkages in reference to the significance threshold outlined in CEQA Appendix G, Part IV (d):

> *d) Does the Project have the potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*

Analysis of the 2020 site remain applicable to the new site. No portions of the Study Area provide connectivity between areas of suitable habitat. For terrestrial species, all portions of the Study Area are within a greater context of urban development, and for aquatic species, there is no connectivity between the Study Area and upstream freshwater habitats. No impact will occur to migratory corridors for terrestrial and aquatic species.

Migratory birds may use portions of the Study Area opportunistically, however, the overwhelming majority of higher quality habitat along the Pacific Flyway exists outside the Study Area. Most of the Study Area is developed or supports disturbed habitats embedded in a highly urbanized setting. Based on these factors, proposed project will result in a **less than significant impact** to migratory corridors and habitat linkages.

Local Policies and Ordinances

This section analyzes the Project's potential impacts and mitigation based on conflicts with local policies and ordinances in reference to the significance threshold outlined in CEQA Appendix G, Part IV (e):

> *e) Does the Project have the potential to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;*

Local plans and policies related to biological resources examined in this analysis are:

- City of Sacramento Tree Ordinance

Potential Impact Bio-10b: Project activities may directly or indirectly impact City Trees as defined in the City Tree Ordinance.

To reduce potential impacts to City Trees to a less-than-significant level, the following measures shall be implemented:

Mitigation Measure Bio-9: For trees that cannot be avoided, any removal of City Trees shall follow the guidelines outlined in the Ordinance Section 12.56.40 and permits shall be acquired as outlined in Section 12.56.050.

Implementation of these mitigation measures will reduce this potential impact to a level that is ***less than significant***.

Habitat Conservation Plans

The Study Area is not located within a Habitat Conservation Plan area.

If the above mentioned mitigation measures are observed, significant impacts to sensitive biological resources are not expected to occur.

Sincerely,

Brian Freiermuth, M.Sc.

Figures and Attachments:
Figure 4h – Project Location and Biological Resources
Attachment 1. Species Database Search Results
Attachment 2. Photo Appendix

REFERENCES

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USDA 1993	United States Department of Agriculture, Soil Conservation Service. 1993. Soil Survey of Sacramento County, California. In cooperation with the University of California Agricultural Experiment Station
USFWS 2022	U.S. Fish and Wildlife Service. 2022. National Wetlands Inventory. Available at: http://www.fws.gov/wetlands/index.html. Accessed: June 2022.
WRA 2020	Biological Resources Technical Report City of Sacramento Groundwater Master Plan, Sacramento, Sacramento County, California. July 2020

Figure 4h. Sensitive Land Cover Types in the Study Area (Well Site 38)

City of Sacramento
Groundwater Master Plan
Sacramento County, California

- Study Area
- Control Building
- Potential Construction Staging Area
- Well Site Activity Area
- Blue Elderberry Location

N

0 50 100

Feet

wra
ENVIRONMENTAL CONSULTANTS

Path: E:\Acad 2000 Files\29000\29359\GIS\ArcMap\Constraints Well Site 38.mxd

Sources: 2019 Vivid Aerial, WRA, Woodard & Curran, 2018-19 USGS LiDAR | Prepared By: mrochelle, 6/3/2022

Attachment 1. Database Search Results

California Natural Diversity Database (CNDDB) Commercial [ds85]

Scientific Name	Common Name	Element Code	Occ Number	MAPNDX	EONDX	Key Quad Code	Key Quad Name	Key County Code	Accuracy	Presence	Occ Type	Occ Rank	Sensitive	Site Date	Elm Date	Owner Management	Federal Status
Linderiella occidentalis	California linderiella	ICBRA06010	118	32443	636	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19950331	19950331	PVT-PIPE TRADES TRUST FUND	None
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	14	32443	638	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19950331	19950331	PVT-PIPE TRADES TRUST FUND	Endangered
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	25	24526	16889	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Good	N	19930819	19930819	CORDOVA RECREATION & PARKS	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	40	30130	4954	3812144	Florin	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	1993XXXX	1993XXXX	UNKNOWN	None
Elanus leucurus	white-tailed kite	ABNKC06010	25	24816	6399	3812153	Carmichael	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	19880313	19880313	SAC COUNTY	None
Elderberry Savanna	Elderberry Savanna	CTT63440CA	2	11371	15253	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	1987XXXX	1987XXXX	STATE (SAC COUNTY LEASE)	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	27	24521	12983	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	20050702	20050702	CSU-SACRAMENTO	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	28	24522	12962	3812154	Sacramento East	SAC	80 meters	Possibly Extirpated	Natural/Native occurrence	None	N	20050604	19931023	SAC COUNTY-PARKS & REC	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	29	24523	12937	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	19921023	19921023	SAC COUNTY-PARKS & REC	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	44	30075	20718	3812154	Sacramento East	SAC	80 meters	Possibly Extirpated	Natural/Native occurrence	None	N	20050604	1993XXXX	SAC COUNTY-PARKS & REC	None
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	10	11431	22741	3812154	Sacramento East	SAC	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19840600	19840600	UNKNOWN	Threatened
Elanus leucurus	white-tailed kite	ABNKC06010	21	24813	6398	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	19900422	19900422	UNKNOWN	None
Linderiella occidentalis	California linderiella	ICBRA06010	126	34793	12914	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	19920402	19920402	PVT-CENTRAL CALIFORNIA TRR	None
Linderiella occidentalis	California linderiella	ICBRA06010	128	34797	12595	3812153	Carmichael	SAC	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19920402	19920402	UNKNOWN	None
Riparia riparia	bank swallow	ABPAU08010	94	11372	12978	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19860601	19860601	SAC COUNTY	None
Linderiella occidentalis	California linderiella	ICBRA06010	49	31558	22317	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Fair	N	19950421	19950214	DOD-BT COLLINS RESERVE TR CNTR	None
Linderiella occidentalis	California linderiella	ICBRA06010	50	32459	6484	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Excellent	N	19960321	19960321	PVT	None
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	90	33686	30620	3812143	Elk Grove	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Fair	N	20070227	20070227	PVT, UNKNOWN	Endangered
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	26	24524	12899	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Excellent	N	19930722	19930722	SAC COUNTY-PARKS & REC	None
Linderiella occidentalis	California linderiella	ICBRA06010	149	28182	29286	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Poor	N	19960310	19960310	PVT	None
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	122	33380	28755	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Poor	N	19960310	19960310	PVT	Threatened
Elderberry Savanna	Elderberry Savanna	CTT63440CA	3	11402	15252	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	1987XXXX	1987XXXX	STATE (SAC COUNTY LEASE)	None
Linderiella occidentalis	California linderiella	ICBRA06010	124	34791	12939	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	19920403	19920403	PVT-SPRR	None
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	11	11316	12887	3812154	Sacramento East	SAC	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19840600	19840600	UNKNOWN	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	9	11343	22740	3812154	Sacramento East	SAC	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19840600	19840600	PVT	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	8	11398	22739	3812154	Sacramento East	SAC	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	198406XX	XXXXXXXX	PVT	Threatened
Accipiter cooperii	Cooper's hawk	ABNKC12040	61	33435	29285	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	19960717	19960717	SAC COUNTY-PARKS & REC	None
Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	CTT44110CA	88	11588	26872	3812153	Carmichael	SAC	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	1983XXXX	1983XXXX	UNKNOWN	None
Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	CTT44110CA	96	11612	26867	3812153	Carmichael	SAC	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	1983XXXX	1983XXXX	UNKNOWN	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	24	24527	4864	3812153	Carmichael	SAC	specific area	Presumed Extant	Natural/Native occurrence	Fair	N	19970617	19970617	SAC COUNTY-PUBLIC WORKS	None
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	6	11337	22744	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	198406XX	198406XX	PVT	Threatened
Linderiella occidentalis	California linderiella	ICBRA06010	183	42727	42727	3812143	Elk Grove	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19930401	19930401	PVT	None
Linderiella occidentalis	California linderiella	ICBRA06010	197	48380	48380	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	20010328	20010328	PVT	None
Athene cunicularia	burrowing owl	ABNSB10010	487	32459	48663	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Excellent	N	19910213	19910213	PVT	None

Attachment 1. Database Search Results

Athene cunicularia	burrowing owl	ABNSB10010	61	11424	25459	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	197402XX	197402XX	CSU-SACRAMENTO, UNKNOWN	None
Athene cunicularia	burrowing owl	ABNSB10010	60	11437	25460	3812154	Sacramento East	SAC	1/10 mile	Extirpated	Natural/Native occurrence	None	N	20001019	197402XX	UNKNOWN	None
Athene cunicularia	burrowing owl	ABNSB10010	488	48664	48664	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	197402XX	197402XX	UNKNOWN	None
Athene cunicularia	burrowing owl	ABNSB10010	569	51256	51256	3812154	Sacramento East	SAC	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19010508	19010508	UNKNOWN	None
Progne subis	purple martin	ABPAU01010	17	54694	54694	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	UNKNOWN	None
Progne subis	purple martin	ABPAU01010	18	54696	54696	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	UNKNOWN	None
Progne subis	purple martin	ABPAU01010	19	54697	54697	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	CALTRANS	None
Progne subis	purple martin	ABPAU01010	20	54698	54698	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	CALTRANS	None
Progne subis	purple martin	ABPAU01010	21	54699	54699	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	CALTRANS	None
Progne subis	purple martin	ABPAU01010	22	54700	54700	3812154	Sacramento East	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	CALTRANS	None
Progne subis	purple martin	ABPAU01010	23	54701	54701	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	UNKNOWN	None
Progne subis	purple martin	ABPAU01010	24	54702	54702	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	CALTRANS	None
Progne subis	purple martin	ABPAU01010	25	54703	54703	3812155	Sacramento West	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2003XXXX	2003XXXX	CALTRANS	None
Taxidea taxus	American badger	AMAJF04010	73	32459	56607	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19910115	19910115	PVT	None
Ardea herodias	great blue heron	ABNGA04010	2	11602	25978	3812153	Carmichael	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	20050318	20050318	PVT	None
Ardea alba	great egret	ABNGA04040	2	11602	25946	3812153	Carmichael	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	20050318	20050318	PVT	None
Taxidea taxus	American badger	AMAJF04010	304	57545	57561	3812154	Sacramento East	SAC	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	XXXXXXXX	XXXXXXXX	UNKNOWN	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	1646	65488	65567	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	20060606	20060606	SAC COUNTY-PARKS & REC	None
Buteo regalis	ferruginous hawk	ABNKC19120	31	32459	66106	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Excellent	N	19910214	19910214	PVT-GRANITE CONSTRUCTION CO	None
Elanus leucurus	white-tailed kite	ABNKC06010	98	65932	66011	3812154	Sacramento East	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	197402XX	197402XX	UNKNOWN	None
Elanus leucurus	white-tailed kite	ABNKC06010	108	65943	66022	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19880503	19880503	UNKNOWN	None
Accipiter cooperii	Cooper's hawk	ABNKC12040	116	68556	68912	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Excellent	N	20080531	20080531	CITY OF SACRAMENTO	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	66	70043	70897	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	20050710	20050710	SACRAMENTO EXECUTIVE AIRPORT	None
Ardea herodias	great blue heron	ABNGA04010	88	72891	73808	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	20080604	20080604	PVT	None
Aquila chrysaetos	golden eagle	ABNKC22010	135	32459	74753	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Good	N	19910214	19910214	PVT-GRANITE CONSTRUCTION CO	None
Athene cunicularia	burrowing owl	ABNSB10010	1253	78083	78961	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	20060711	20060711	PVT	None
Athene cunicularia	burrowing owl	ABNSB10010	1269	78128	79018	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Fair	N	20030307	20030307	DOD-SACRAMENTO ARMY DEPOT	None
Athene cunicularia	burrowing owl	ABNSB10010	127	20688	9327	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	20060618	20060618	PVT, DOD-SACRAMENTO ARMY DEPOT	None
Elanus leucurus	white-tailed kite	ABNKC06010	142	78322	79245	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	200908XX	200908XX	SAC COUNTY-PARKS & REC	None
Athene cunicularia	burrowing owl	ABNSB10010	1633	81423	82401	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	20100920	20100920	PVT	None
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	280	82476	83495	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Fair	N	20080701	20080701	UNKNOWN	Endangered
Buteo swainsoni	Swainson's hawk	ABNKC19070	1769	84532	85552	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	20110427	20110427	SAC COUNTY-PARKS & REC	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2204	88585	89602	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Poor	N	20100620	20100620	UNKNOWN	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2205	88589	89605	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	20100819	20100819	SAC COUNTY	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2213	88604	89620	3812154	Sacramento East	SAC	2/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	2012XXXX	2012XXXX	SAC COUNTY, CITY OF SACRAMENTO	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2214	88606	89622	3812154	Sacramento East	SAC	2/5 mile	Presumed Extant	Natural/Native occurrence	Good	N	2010XXXX	2010XXXX	SAC COUNTY	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2215	88615	89624	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Good	N	20100714	20100714	PVT	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2216	88617	89632	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	20120423	20120423	CITY OF SACRAMENTO	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2217	88619	89634	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	20070713	20070713	PVT	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	501	23020	20410	3812155	Sacramento West	YOL	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	19940811	19940811	UNKNOWN	None

Attachment 1. Database Search Results

Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	97	89327	90321	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	20111019	20111019	CITY OF SACRAMENTO, UNKNOWN	None
Spirinchus thaleichthys	longfin smelt	AFCHB03010	14	89689	90689	3812155	Sacramento West	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	20120927	20040105	UNKNOWN, STATE	Candidate
Melospiza melodia pop. 1	song sparrow ("Modesto" population)	ABPBXA3013	83	90034	91047	3812154	Sacramento East	SAC	5 miles	Presumed Extant	Natural/Native occurrence	Unknown	N	19000609	19000609	UNKNOWN	None
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	AFCHA0209K	5	90985	92033	3812163	Citrus Heights	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Poor	N	2012XXXX	2012XXXX	SAC COUNTY, CITY OF SACRAMENTO	Threatened
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	AFCHA0209K	28	91655	92726	3812176	Knights Landing	YOL	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	20120510	20120510	UNKNOWN	Threatened
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	752	93640	94770	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	20130115	20130115	UNKNOWN	Threatened
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	753	93641	94781	3812154	Sacramento East	SAC	3/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19820101	19820101	UNKNOWN	Threatened
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	35	93643	637	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	19950105	19950105	PVT-PIPE TRADES TRUST FUND	Threatened
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	131	94757	95863	3812154	Sacramento East	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19920403	19920403	PVT	Threatened
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	886	94759	95864	3812153	Carmichael	SAC	80 meters	Extirpated	Natural/Native occurrence	None	N	20100203	20100203	SMUD	Threatened
Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	32	31558	6893	3812154	Sacramento East	SAC	non-specific area	Possibly Extirpated	Natural/Native occurrence	None	N	20110316	19950208	DOD	Threatened
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	21	82507	1011	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	20100707	19960321	PVT-GRANITE CONSTRUCTION CO	Endangered
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	278	95203	96348	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2009XXXX	2009XXXX	SAC AREA FLOOD CONTROL AGENCY	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	279	95208	96349	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2009XXXX	2009XXXX	SAC AREA FLOOD CONTROL AGENCY	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	7	11410	22742	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2009XXXX	2009XXXX	SAC AREA FLOOD CONTROL AGENCY	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	280	95214	96353	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2009XXXX	2009XXXX	SAC AREA FLOOD CONTROL AGENCY	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	281	95215	96354	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Unknown	N	2009XXXX	2009XXXX	SAC AREA FLOOD CONTROL AGENCY	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	276	95200	96337	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Good	N	20130517	20130517	DOD-COE	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	282	95226	96356	3812153	Carmichael	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Good	N	20130513	20130513	SAC AREA FLOOD CONTROL AGENCY	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	283	95231	96367	3812155	Sacramento West	SAC	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19490506	19490506	UNKNOWN	Threatened
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	293	95266	96405	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	20080428	20080428	SAC COUNTY	Threatened
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	67	95291	13094	3812154	Sacramento East	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Poor	N	19920402	19920402	PVT-SPRR	Endangered
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	69	34795	12473	3812144	Florin	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Poor	N	19920402	19920402	PVT-SPRR	Endangered
Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	66	94757	13036	3812154	Sacramento East	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Poor	N	19920403	19920403	PVT-SPRR	Endangered
Linderiella occidentalis	California linderiella	ICBRA06010	125	95291	13153	3812154	Sacramento East	SAC	1/10 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19920402	19920402	PVT-SPRR	None
Coccyzus americanus occidentalis	western yellow-billed cuckoo	ABNRB02022	194	90034	96966	3812154	Sacramento East	SAC	5 miles	Extirpated	Natural/Native occurrence	None	N	187707XX	187707XX	UNKNOWN	Threatened
Agelaius tricolor	tricolored blackbird	ABPBXB0020	500	96000	97150	3812153	Carmichael	SAC	1/5 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	20150424	20140619	PVT	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2675	99705	101252	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	20170720	20170720	PVT	None
Linderiella occidentalis	California linderiella	ICBRA06010	452	B2389	114320	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Fair	N	20181220	20181220	PVT-PGE	None
Gonidea angulata	western ridged mussel	IMBIV19010	132	90034	118977	3812154	Sacramento East	SAC	5 miles	Presumed Extant	Natural/Native occurrence	Unknown	N	XXXXXXXX	XXXXXXXX	UNKNOWN	None
Spea hammondii	western spadefoot	AAABF02020	501	B1494	113400	3812153	Carmichael	SAC	1 mile	Presumed Extant	Natural/Native occurrence	Unknown	N	19250429	19250429	UNKNOWN	None

Attachment 1. Database Search Results

Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	110	A6501	108263	3812154	Sacramento East	SAC	non-specific area	Presumed Extant	Natural/Native occurrence	Good	N	20130711	20130711	CITY OF SACRAMENTO	None
Linderiella occidentalis	California linderiella	ICBRA06010	510	B5592	118568	3812154	Sacramento East	SAC	specific area	Possibly Extirpated	Natural/Native occurrence	None	N	1981XXXX	1981XXXX	UNKNOWN	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	108	A6497	108260	3812153	Carmichael	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Fair	N	20161024	20161024	SAC COUNTY	None
Buteo swainsoni	Swainson's hawk	ABNKC19070	2756	B1153	113047	3812154	Sacramento East	SAC	80 meters	Presumed Extant	Natural/Native occurrence	Unknown	N	20170623	20170623	SAC COUNTY	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	45	30076	14446	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	20191024	20191024	SAC COUNTY-PARKS & REC	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	147	B8079	121192	3812153	Carmichael	SAC	80 meters	Presumed Extant	Transplant Outside of Native Hab./Range	Unknown	N	20200630	20200630	PVT	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	148	B8080	121193	3812153	Carmichael	SAC	80 meters	Presumed Extant	Transplant Outside of Native Hab./Range	Unknown	N	20200630	20200630	PVT	None
Sagittaria sanfordii	Sanford's arrowhead	PMALI040Q0	149	B8081	121194	3812154	Sacramento East	SAC	specific area	Presumed Extant	Natural/Native occurrence	Good	N	20201024	20201024	UNKNOWN	None

CNPS Rare Plant Inventory

California Native Plant Society

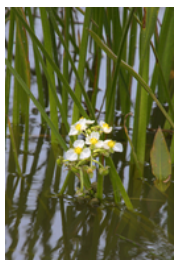
Search Results

22 matches found. Click on scientific name for details

Search Criteria: 9-Quad include [**3812163:3812153:3812143:3812155:3812165:3812164:3812144:3812154:3812145**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
Astragalus tener var. *ferrisiae*	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	None	None	G2T1	S1	1B.1	No Photo Available
Brodiaea rosea ssp. *vallicola*	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	 © 2011 Steven Perry
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1	 Dean Wm. Taylor 1997
Centromadia parryi ssp. *parryi*	pappose tarplant	Asteraceae	annual herb	May-Nov	None	None	G3T2	S2	1B.2	No Photo Available
Centromadia parryi ssp. *rudis*	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	G3T3	S3	4.2	No Photo Available
Cuscuta obtusiflora var. *glandulosa*	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	Jul-Oct	None	None	G5T4?	SH	2B.2	No Photo Available
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2	No Photo Available
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	G3	S3	4.2	 © 2016 Aaron Schusteff
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2	 ©2004 Carol W. Witham
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	 © 2017 John Doyen

Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	 © 2020 Steven Perry
Juncus leiospermus var. *ahartii*	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	None	None	G2T1	S1	1B.2	 © 2004 Carol W. Witham
Lasthenia chrysantha	alkali-sink goldfields	Asteraceae	annual herb	Feb-Apr	None	None	G2	S2	1B.1	 © 2009 California State University, Stanislaus
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	 ©2000 John Game
Lepidium latipes var. *heckardii*	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	None	None	G4T1	S1	1B.2	 2018 Jennifer Buck
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	No Photo Available
Navarretia eriocephala	hoary navarretia	Polemoniaceae	annual herb	May-Jun	None	None	G4?	S4?	4.3	 © 2018 Leigh Johnson
Orcuttia tenuis	slender Orcutt grass	Poaceae	annual herb	May-Sep(Oct)	FT	CE	G2	S2	1B.1	 © 2013 Justy Leppert
Orcuttia viscida	Sacramento Orcutt grass	Poaceae	annual herb	Apr-Jul(Sep)	FE	CE	G1	S1	1B.1	No Photo Available

Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	 ©2013 Debra L. Cook
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	No Photo Available
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	No Photo Available

Showing 1 to 22 of 22 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2022. Rare Plant Inventory (online edition, v9-01 1.5). Website https://www.rareplants.cnps.org [accessed 7 June 2022].

Photo 1. Looking west across the replacement well location and well activity area.

Photo 2. Looking north across the replacement well location and well activity area.

Photo 3. Elderberry shrubs located near the potential construction staging area.

Photo 4. Looking east into the potential construction staging area.

APPENDIX E – GROUNDWATER MODEL TECHNICAL MEMO

TECHNICAL MEMORANDUM

TO:	Kathy Sananikone, City of Sacramento
PREPARED BY:	Sevim Onsoy, Woodard & Curran
REVIEWED BY:	Ali Taghavi, Woodard & Curran
DATE:	March 30, 2023
RE:	City of Sacramento Well Replacement Program Groundwater Modeling Technical Memorandum

This technical memorandum (TM) describes the approach used for the groundwater modeling analysis performed in support of the Environmental Impact Report (EIR) for the City of Sacramento's Groundwater Master Plan (GWMP) Well Replacement Program (proposed Project or Project). The modeling analyses includes development of three scenarios to evaluate potential impacts of the proposed Project on groundwater resources:

- Existing Conditions Baseline,
- No Project, and
- Preferred Project Scenarios.

These scenarios were built off the groundwater modeling conducted through the Groundwater Sustainability Plan (GSP) efforts for the North American Subbasin and South American Subbasin under the Sustainable Groundwater Management Act (SGMA). Modeling results were evaluated in the context of the Sustainable Management Criteria (SMC) established through each GSP to assess if the scenario is anticipated to cause potential undesirable results associated with the SGMA's sustainability goals. Modeling analysis and findings presented in this TM serve to support the assessment of the EIR's impact analysis.

This TM includes the following four sections:

Section 1 Introduction presents a brief Project background.

Section 2 Modeling Approach describes the groundwater modeling approach, scenario development, and modeling assumptions used in the scenarios.

Section 3 Modeling Analysis and Results presents the groundwater modeling results for the three scenarios and evaluation of potential Project impacts.

Section 4 Conclusion provides a conclusion of the potential Project impacts in the context of the GSPs.

1. INTRODUCTION

The City of Sacramento (City) has historically relied on groundwater to meet about 15 percent to 20 percent of its water supply demands, making groundwater an important component of the City's water supply portfolio. The City's primary water source is surface water from the Sacramento and American Rivers, where rights to extract river water are derived through five appropriative water rights permits. Overall, the City has sufficient surface water resources to meet projected demands, yet presently is limited by surface water treatment capacity. The Well Replacement Program, as part of the 2017 GWMP, maintains the City's capability to extract groundwater more reliably, particularly during dry years, which is anticipated to be more frequent and intense due to climate change. The Well Replacement Program will allow the City to improve long-term water supply reliability, diversify its water supply portfolio as climate and regulatory changes may impact future availability of surface water supplies, and promote conjunctive use to ensure long-term sustainability of surface and groundwater supplies.

The City currently has 38 existing active and inactive wells in the North American Subbasin and in the South American Subbasin. The City's current well inventory also includes three recently completed wells, but not yet permitted, in the South American Subbasin, including two wells near the Shasta Park (Well 165 [Shasta 1] and Well 167 [Shasta 2]) and one well (Well 166) under construction at the E.A. Fairbairn Water Treatment Plant located on the south bank of the lower American River. Among the existing wells, five wells (Wells 153A, 164, 165 [Shasta 1], 166 [E.A. Fairbairn]) and 167 [Shasta 2][1]are not considered for replacement. So, there are a total of 42 wells that would be operated under the Project conditions. The City of Sacramento Well Replacement Program involves construction and operation of up to 38 groundwater extraction wells within the City's water service area that overlies the North American and South American Subbasins of the Sacramento Valley Groundwater Basin.

2. MODELING APPROACH

The overall modeling approach used for the Well Replacement Program EIR is consistent with the modeling performed under the North American Subbasin and South American Subbasin GSPs. The City's Well Replacement Program was incorporated into the GSP baseline scenario under the future projected conditions. Therefore, the proposed Project modeling analysis discussed in this TM and incorporated into the EIR is in alignment with the GSP goal for effectively and sustainably managing groundwater resources in the future in each subbasin consistent with the SGMA requirements.

[1] Well 167 [Shasta 2] is a second well at the Shasta reservoir as a replacement for existing Well 83.

2.1 CoSANA Model

The CoSANA model is an integrated water resources model of the Consumnes, South American, and North American Subbasins that simulates groundwater and surface water conditions under a unified model to assist with water management activities in the Sacramento region. **Figure 1** shows the City boundary, CoSANA model boundary, and groundwater subbasin boundaries within the model domain. **Figure 2** shows the CoSANA model domain, subbasin and subregion boundaries. The City's service area is represented by two model subregions split by the American River, one located in the North American Subbasin and the other in the South American Subbasin.

Figure 1: Project Vicinity

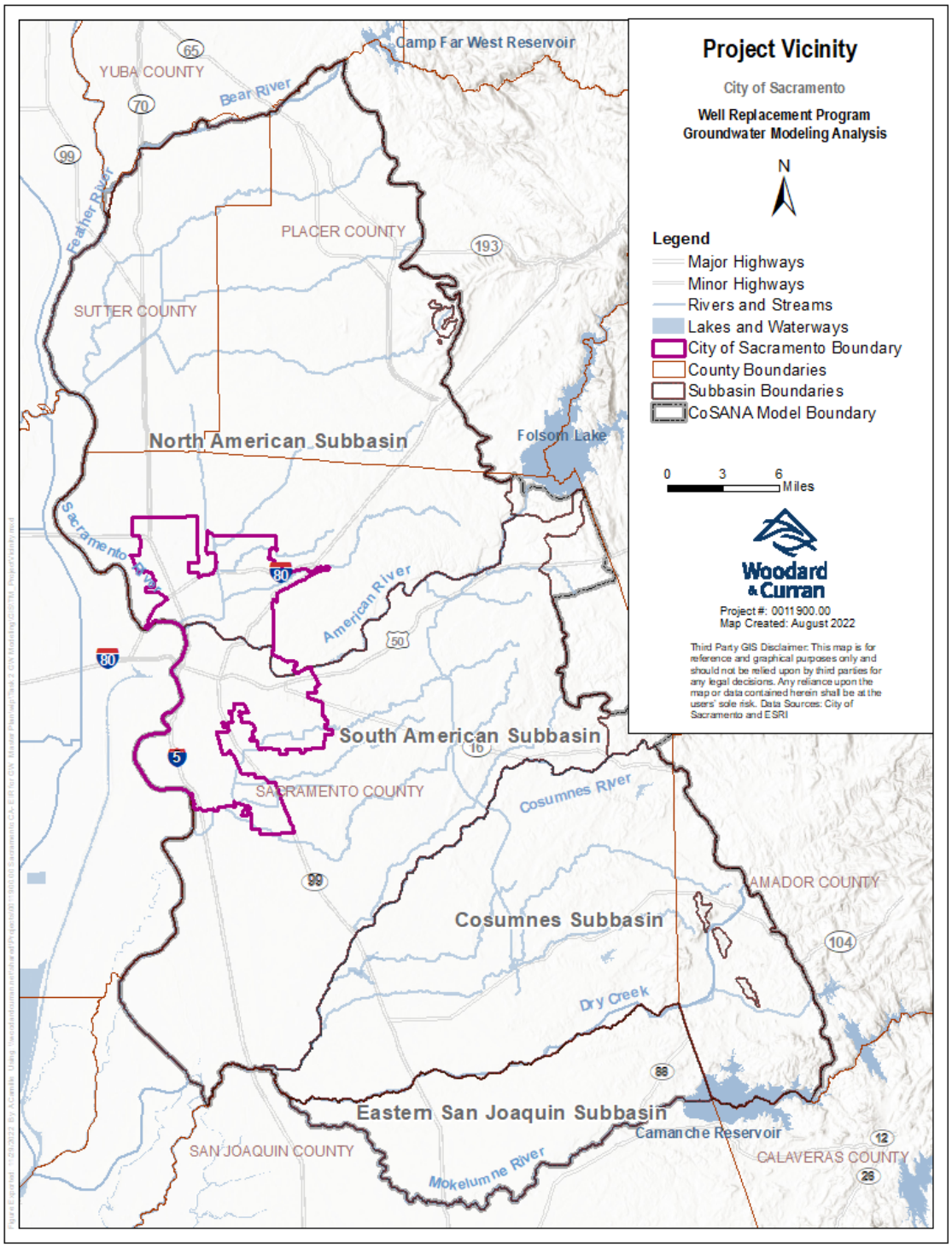
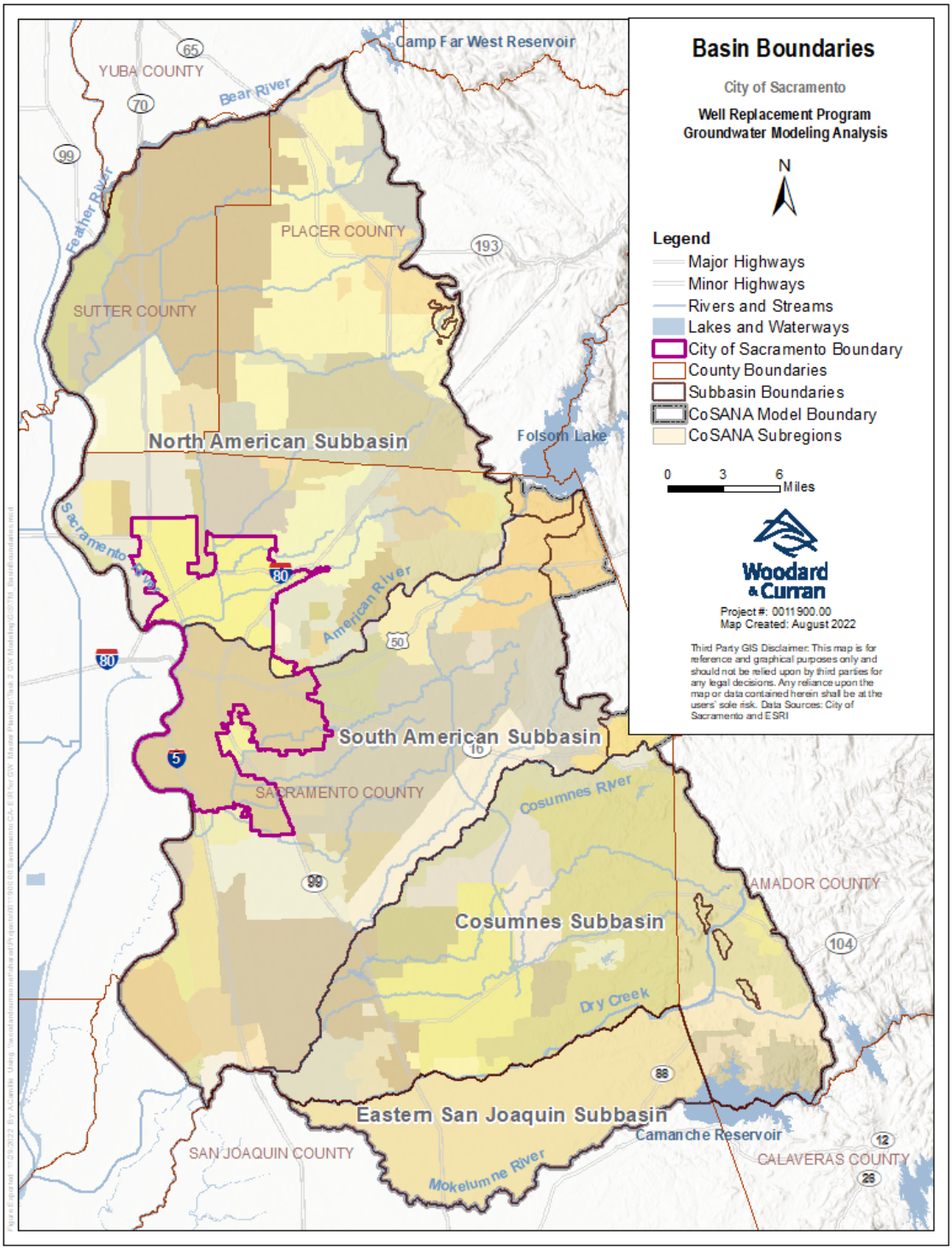


Figure 2: Model Domain and Basin Boundaries



CoSANA is a comprehensive model used during the development of the GSPs, including the work related to SMC that were established to achieve sustainability and manage the basin in a sustainable manner. Three modeling scenarios developed for the EIR are built off the two CoSANA baseline simulations, GSP Current Conditions Baseline (CCBL) and Projected Conditions Baseline (PCBL). **Table 1** provides a summary of the common model assumptions used in the GSP CCBL and PCBL scenarios as these assumptions are relevant for the EIR scenarios, as described further in the following sections.

Table 1: CoSANA Baseline Assumptions

Baseline Model Feature	Current Conditions Baseline	Projected Conditions Baseline
Hydrologic Conditions	50-year hydrology from water years 1970 to 2019	50-year hydrology from water years 1970 to 2019
Land Use and Cropping Patterns	2014 and 2015 Sacramento County Surveys	Current (2014 and 2015) land use modified with urban footprint for proposed developments
Agricultural Demand	Estimated by model based on current crop mix and irrigation practices and historical hydrology	Estimated by model reflective of modified land use with urban footprint, and based on current irrigation practices, and historical hydrology
Agricultural Surface Water Supplies	Current surface water supplies	Surface water supplies reflective of modified urban land use
Agricultural Groundwater Supplies	Current groundwater supplies	Groundwater supplies to meet demand not met by surface water
Urban Demand	Last 10 years of the historical conditions (water years 2009 through 2018) averaged by year type	Projected urban demands for 2035 or 2040 per 2015 UWMPs or other planning documents
Municipal Surface Water Supplies	Last 10 years of the historical conditions (water years 2009 through 2018) averaged by year type	Projected surface water deliveries
Municipal Groundwater Supplies	Last 10 years of the historical conditions (water years 2009 through 2018) averaged by year type	Projected groundwater supplies
Municipal Recycled Water Supplies	None	As provided in planning documents of urban purveyors
Surface Water Delivery Infrastructure	Current facilities and capacities	Current facilities in place
Municipal Wells	Current groundwater infrastructure	Current facilities in place and proposed replacement wells when information available
Remediation Operations	Current groundwater infrastructure	Same as Current Conditions Baseline

2.2 Scenario Development

Three modeling scenarios were developed to assess the proposed Project's effect on the SMC: 1) Existing Conditions Baseline (ECBL), 2) No Project Scenario, and 3) Preferred Project Scenario. As described earlier, the three scenarios are built off the modeling analysis performed under the GSP efforts using the two existing CoSANA baseline simulations, GSP CCBL and GSP PCBL. **Table 2** provides a brief definition of the three scenarios and modifications incorporated for the EIR analysis since the GSP completion.

Table 2: Groundwater Modeling Scenarios for EIR

Scenario Number	Scenario Name	Definition	Proposed Approach and Modifications
1	Existing Conditions Baseline	• Based on the City's existing demand, groundwater, and surface water operations	• Modifications to the GSP CCBL to allow approximately 20,000 AFY pumping in the North American Subbasin
2	Preferred Project	• City's 2040 projections for land use, urban demands and supply • Based on the City's GWMP with replacement of all active and inactive wells, some of which change basins	• Based on the GSP PCBL that includes the Maximum Groundwater Use Project as specified in the City's 2017 GWMP • Incorporates the Project facilities ramping up over time with the Project well replacement program
3	No Project Scenario	• Same as Scenario 2 without the proposed Project	• Modifications to the GSP PCBL to incorporate the City's existing pumping and surface water operations

2.2.0 Existing Conditions Scenario

The Existing Conditions Baseline Scenario is built off the GSP CCBL and represents the existing land use for 2015 conditions, demand and supply conditions for the City's service area and the purveyors in the model domain. The City's pumping in the North American Subbasin is approximately 20,000 AFY on an average annual basis under this scenario, compared to 14,300 AFY pumping that was assumed in the GSP CCBL at the time of the GSP development. This modification to the North American Subbasin pumping was incorporated into the EIR modeling analysis to reflect the City's current pumping in this subbasin. With respect to the South American Subbasin, the EIR and GSP CCBL scenarios are identical.

The City's groundwater pumping under the ECBL is simulated with a total of 29 existing active and permitted municipal wells operated by the City within the service area, including 26 active existing municipal wells (24 wells in the North American Subbasin and two wells in the South American Subbasin), and three (3) wells pending permitting in the South American Subbasin (Well 165 [Shasta 1], Well 167 [Shasta 2], and Well 166 [E.A. Fairbairn]). Additionally, the City has four active, permitted municipal wells that are currently offline in the North American Subbasin. **Figure 3** shows the locations of the City's existing municipal wells included both in the ECBL and GSP CCBL

scenarios. For both ECBL and GSP CCBL scenarios, the Shasta wells and E.A. Fairbairn well are considered to be constructed and fully operational for the entire modeling simulation period, consistent with the modeling analysis for the GSP.

The number of wells simulated under the ECBL represents the well status consistent with the GSP CCBL modeling analysis and may not necessarily reflect the current operational well status (see the Project Description section for the current well status as of 2023). While the City's operational status of a well can change over time due to factors such as changes in water quality conditions, and/or changes in regulations or reporting requirements, the EIR modeling analysis for the ECBL represents the City's pumping operations for long-term sustainable management of groundwater resources in alignment with the GSP.

2.2.1 Preferred Project Scenario

The Preferred Project Scenario is built off the GSP PCBL and represents the proposed Project based on the City's 2040 future projections for land use, water demand and supply. This scenario is based on the Maximum Groundwater Use Scenario as presented in the City's 2017 GWMP. Analysis of the Project under a maximum future groundwater use scenario presents a conservative approach for evaluating the potential Project impacts.

A minor modification from the PCBL includes the timeline of the Project facilities ramping up to reflect pumping shifting from the North American Subbasin to the South American Subbasin consistent with the Well Replacement Program. This minor modification results in slightly increased pumping (only 800 AFY) in the North American Subbasin and decreased pumping in the South American Subbasin by the same amount compared to the GSP PCBL. This reflects some of the existing wells pumping in the North American Subbasin in the early simulation years prior to their replacement schedule in the South American Subbasin.

The Preferred Project Scenario simulates the City's 42 wells, including 38 existing active and inactive municipal production wells identified for replacement. Of the proposed 38 replacement groundwater extraction wells, 20 wells are located in the North American Subbasin and 18 are located in the South American Subbasin. **Figure 4** shows the locations of the 38 replacement wells relative to the existing municipal production wells. All wells except two would produce approximately 1,250 gallons per minute (gpm) of groundwater. The two exceptions are Well 23 in the North American Subbasin and Well 38 in the South American Subbasin, capable of producing approximately 750 gpm and 3,000 gpm, respectively. Among the existing wells, five wells (Wells 153A, 164, 165 [Shasta 1], 166 [E.A. Fairbairn]) and 167 [Shasta 2] are not considered for replacement.

2.2.2 No Project Scenario

The No Project Scenario represents the future projected conditions for land use, water demand and supply without the City's proposed Project. Therefore, under the No Project Scenario, the City's groundwater extraction would be the same as in the Existing Conditions Baseline.

All other urban purveyors within the model domain would operate based on their future projected conditions of land use water demand and supply, consistent with the GSP PCBL scenario.

Figure 3: City of Sacramento Existing Municipal Production Wells

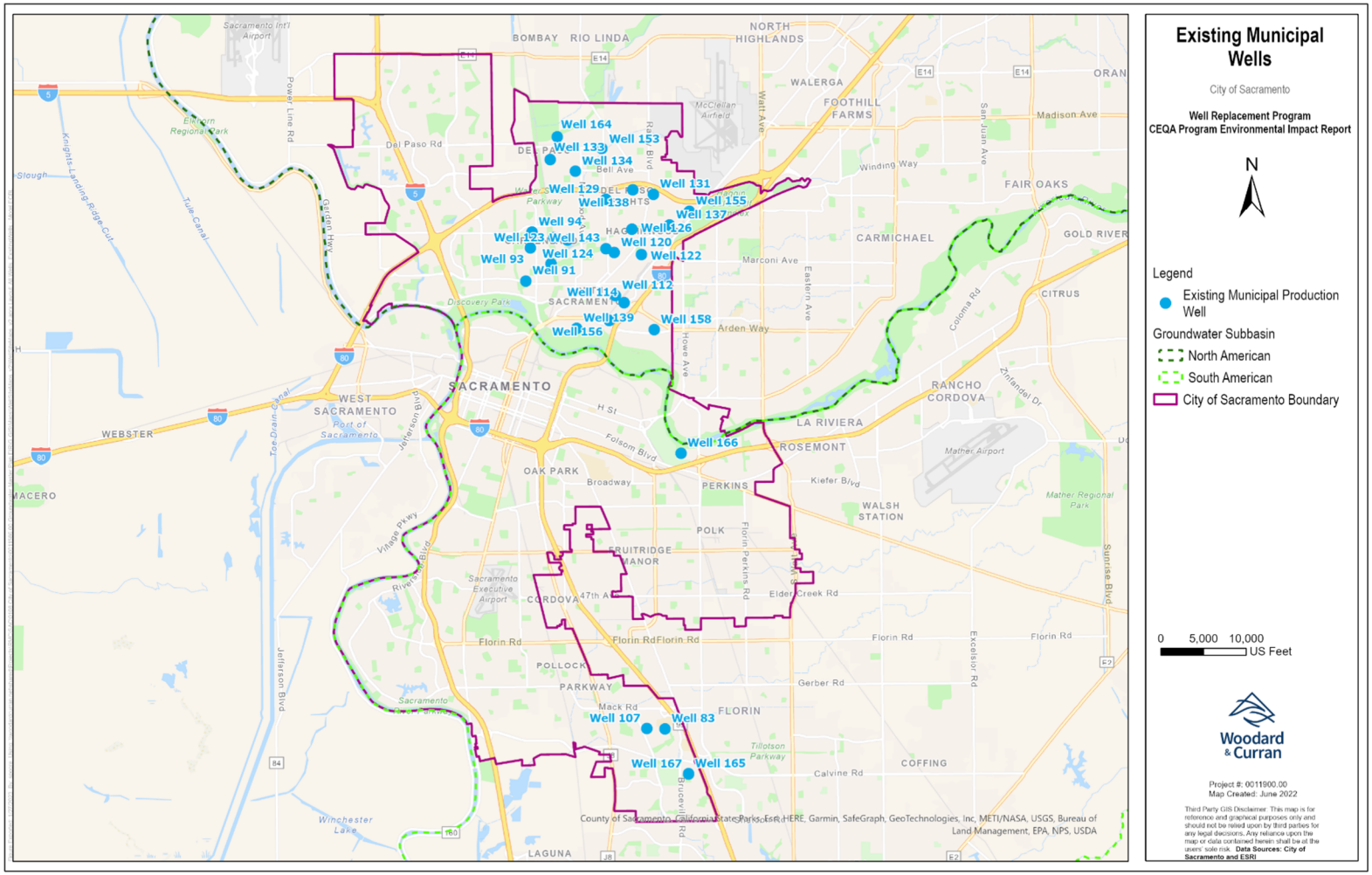
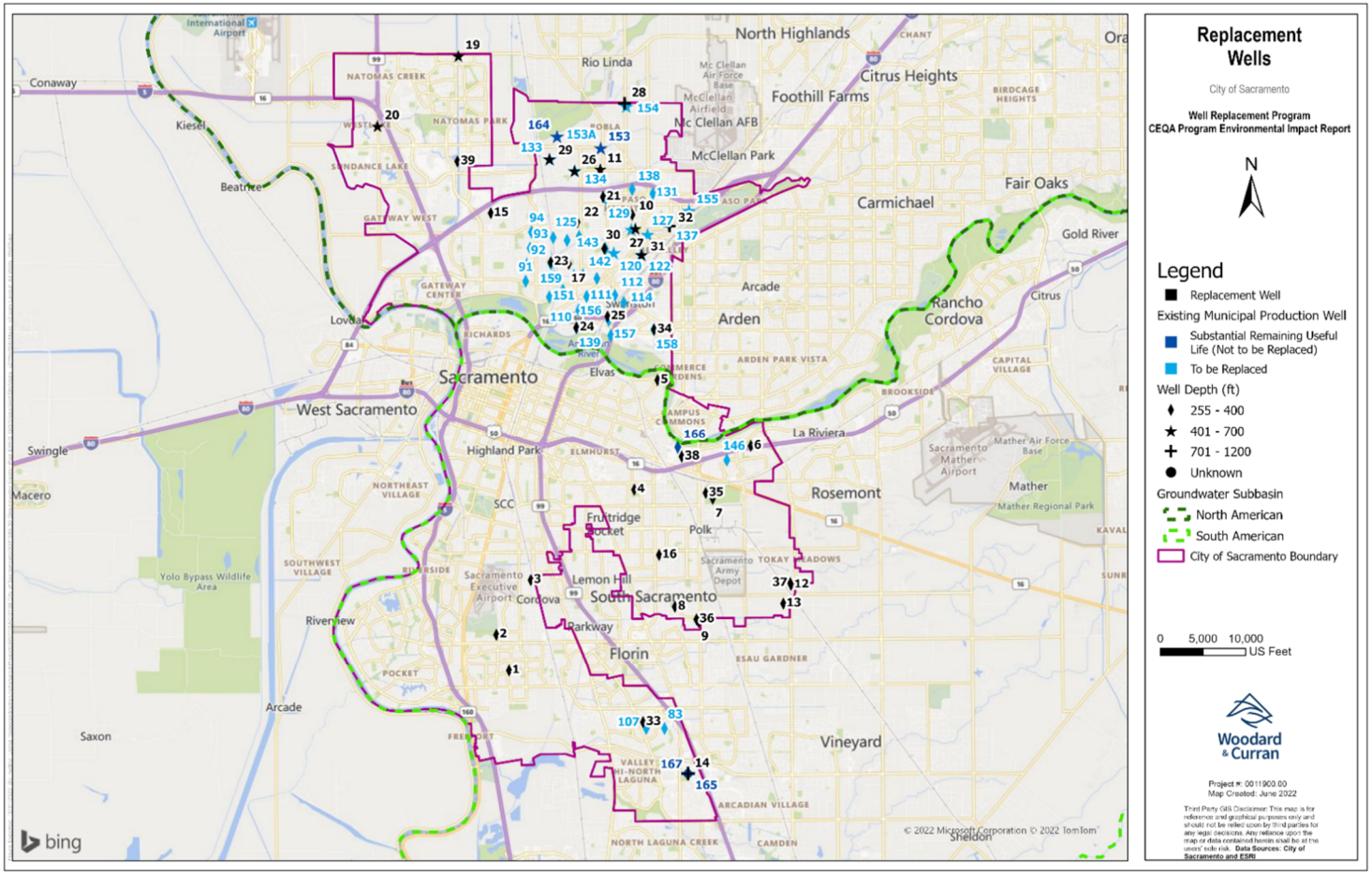


Figure 4: City of Sacramento Replacement Wells



Note to Figure 4: Well numbering corresponds to well numbering in the City's Groundwater Master Plan (2017). Well 18 does not exist due to a typo in Groundwater Master Plan. The Alternative Well Number corresponds to the City's numbering of the existing wells to be replaced.

2.3 Model Assumptions

The Existing Conditions Baseline reflects the current conditions with respect to the land use, water demand and use for the City of Sacramento. The future planning period for the EIR groundwater modeling is based on the City's 2040 projections from the 2015 Urban Water Management Plan (UWMP), consistent with the GSP modeling analysis. The No Project Scenario represents the City's existing pumping without the Project based on the future projected 2040 land use, urban demand and supply projections.

This section provides an overview of the key model assumptions related to the hydrology, urban demand, groundwater pumping, and surface water diversions relevant to the City's EIR scenarios. The hydrologic period and the data for land use, cropping patterns, agricultural demands and supplies are identical to the GSP modeling. Furthermore, urban demand and supplies for other entities in the modeling area are all identical to the modeling scenarios developed under the GSP efforts.

2.3.1 Hydrology

CoSANA model used in the EIR modeling analysis simulates a 50-year hydrology for water years 1970 1969 through 2019 (October 1, 1969 through September 30, 2019) for precipitation, evapotranspiration, and streamflow. This represents reasonably long-term conditions to evaluate the effects of water resources management activities over a 50-year timeline established under the GSP efforts.

All three scenarios presented in the EIR analysis simulate the same hydrology. As the Project area receives surface water supplies from both the Sacramento River and the American River, a composite water year type index of both rivers, referred to as Sacramento Area Integrated Water Resources Model (SacIWRM) Index, was developed previously to determine hydrologic year types for use in the City's groundwater modeling analysis. The SacIWRM Index is based primarily on the American River Index, except for the Drier Years, which is a composite of the American River and the Sacramento River indices. Water year classifications in the SacIWRM model were considered both in the City's 2017 GWMP and the GSP modeling analysis for classifying the City's groundwater pumping by water year types. **Table 3** presents the SacIWRM index and Sacramento Valley Index Water Year Type from the California Department of Water Resources (DWR). In this modeling analysis, and consistent with the GSP efforts, the City's groundwater pumping by water year type is defined as either wet, normal, drier, driest or drier & critical.

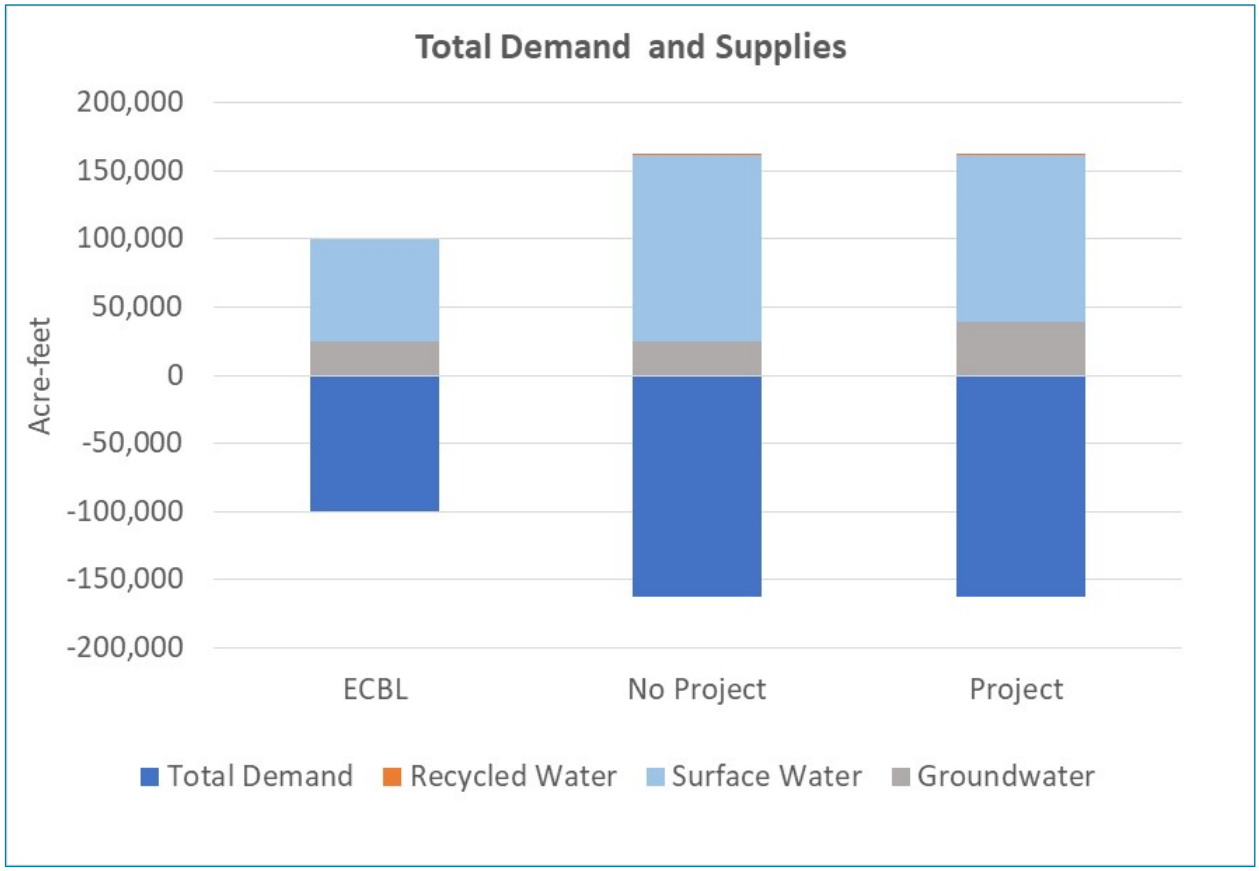
Table 3: Historical Water Year Types 1970-2019

Water Year	SacIWRM Water Year Type	Sacramento Valley Index Water Year Type (DWR)	Water Year	SacIWRM Water Year Type	Sacramento Valley Index Water Year Type (DWR)	Water Year	SacIWRM Water Year Type	Sacramento Valley Index Water Year Type (DWR)
1970	Normal	Wet	1987	Drier	Dry	2004	Normal	Below Normal
1971	Wet	Wet	1988	Drier & Critical	Critical	2005	Wet	Above Normal
1972	Normal	Below Normal	1989	Wet	Dry	2006	Wet	Wet
1973	Wet	Above Normal	1990	Drier & Critical	Critical	2007	Drier	Dry
1974	Wet	Wet	1991	Normal	Critical	2008	Drier & Critical	Critical
1975	Wet	Wet	1992	Drier & Critical	Critical	2009	Normal	Dry
1976	Drier & Critical	Critical	1993	Wet	Above Normal	2010	Wet	Below Normal
1977	Driest	Critical	1994	Drier & Critical	Critical	2011	Wet	Wet
1978	Wet	Above Normal	1995	Wet	Wet	2012	Normal	Below Normal
1979	Wet	Below Normal	1996	Wet	Wet	2013	Drier	Dry
1980	Wet	Above Normal	1997	Normal	Wet	2014	Drier & Critical	Critical
1981	Normal	Dry	1998	Wet	Wet	2015	Driest	Critical
1982	Wet	Wet	1999	Wet	Wet	2016	Wet	Below Normal
1983	Wet	Wet	2000	Wet	Above Normal	2017	Wet	Wet
1984	Wet	Wet	2001	Drier	Dry	2018	Wet	Below Normal
1985	Normal	Dry	2002	Normal	Dry	2019	Wet	Wet
1986	Wet	Wet	2003	Wet	Above Normal			

2.3.2 Urban Demand

The City's current demand of approximately 100,000 AFY was used in the ECBL based on the 10-year average demand from 2009 to 2018, consistent with the assumption in the GSP CCBL. The City's 2040 retail urban demand projection of 162,029 AFY, as reported in the 2015 UWMP, was used in the Preferred Project Scenario, consistent with the assumption used in the GSP PCBL. This includes 1,000 AFY of future planned recycled water deliveries to Sacramento Power Authority Cogen Project. Total annual retail urban demand and monthly retail urban demand patterns in the ECBL remain the same in the GSP CCBL. Similarly, total demand and demand patterns in the No Project and Preferred Project Scenarios are identical to the GSP PCBL. **Figure 5** shows annual average retail urban demand for the EIR scenarios.

Figure 5: City of Sacramento Total Demand and Supplies for EIR Scenarios



2.3.3 Groundwater Pumping

Tables 4, 5 and **6** present the City's pumping in the North and South American Subbasins and total pumping, respectively, by water year types based on the SacIWRM Index presented in **Table 3**. While the City does not currently operate its groundwater wells based on water year type, the City's pumping by water year types is considered representative of the Project planning and implementation, consistent with the 2017 GWMP and GSP modeling analysis. Total pumping by the City remains the same for the ECBL and No Project Scenario (**Tables 4** through **6**, **Figures 6**, **7**, and **8**). Under the Preferred Project, total pumping is increased overall as compared to the ECBL and No Project, and pumping is also shifted from north to south of the American River (**Tables 4** through **6**, **Figures 6** and **9**).

Table 4: North American Subbasin Annual Groundwater Pumping by Water Year Type under Existing Conditions Baseline, No Project Scenario, and Preferred Scenario

Water Year Type	Existing Conditions Baseline Pumping (AFY)	No Project Scenario Pumping (AFY)	Preferred Project Scenario Pumping (AFY)
Wet Year	13,797	13,797	11,553
Normal Year	18,124	18,124	16,740
Drier Year	25,772	25,772	22,192
Drier & Critical Year	37,068	37,068	38,261
Driest Year	41,841	41,841	38,261
Annual Average - North American Subbasin	20,000	20,000	19,083

Table 5: South American Subbasin Annual Groundwater Pumping by Water Year Type under Existing Conditions Baseline, No Project Scenario, and Preferred Scenario

Water Year Type	Existing Conditions Baseline Pumping (AFY)	No Project Scenario Pumping (AFY)	Preferred Project Scenario Pumping (AFY)
Wet Year	1,761	1,761	12,749
Normal Year	3,521	3,521	19,124
Drier Year	5,282	5,282	25,499
Drier & Critical Year	11,885	11,885	43,029
Driest Year	11,885	11,885	43,029
Annual Average - South American Subbasin	4,217	4,217	19,661

Table 6: City of Sacramento Total Annual Groundwater Pumping by Water Year Type under Existing Conditions Baseline, No Project Scenario, and Preferred Scenario

Water Year Type	Existing Conditions Baseline Pumping (AFY)	No Project Scenario Pumping (AFY)	Preferred Project Scenario Pumping (AFY)
Wet Year	15,558	15,558	24,302
Normal Year	21,645	21,645	35,864
Drier Year	31,054	31,054	47,690
Drier & Critical Year	48,953	48,953	81,290
Driest Year	53,726	53,726	81,290
Annual Average - Total	24,217	24,217	38,743

Well names, locations, well screening depths, and individual well pumping schedules for the existing and replacement wells are similar to the GSP scenarios. As previously noted, ECBL represents the City's 29 existing well locations (**Figure 3**). The Preferred Project represents 43

existing wells, including the 38 existing active and inactive wells identified for replacement and five wells not considered for replacement (**Figure 4**). Preferred Scenario represents the highest groundwater pumping capacity, with replacement of the City's existing active and inactive production wells in either the same, adjacent and/or different locations.

For the purpose of the EIR modeling, wells owned and operated by the City are assumed to pump first to meet retail urban demand. This assumption has been made in order to conservatively evaluate impacts to the groundwater basin under a reasonable maximum groundwater use scenario.

2.3.4 Surface Water Diversions

The EIR modeling analysis assumes that remaining retail urban demand not met by groundwater pumping and all demands aside from retail urban demand are met by surface water diversions from the Sacramento and American Rivers, consistent with the GSP modeling analysis. Surface water diversions and deliveries were split between the American and Sacramento Rivers based on current and projected future surface water treatment plant capacity.

Of the retail urban demand met by surface water, 55 percent is assumed to be sourced from the Sacramento River while the remaining 45 percent is assumed to be sourced from the American River. This allocation between the surface water facilities is consistent with historical operation and consistent with the GSP modeling analysis. **Figure 5** presents a comparison of annual surface water diversions for the EIR scenarios. While groundwater pumping is identical for the ECBL and No Project, surface water diversions are higher under the No Project to meet higher future projected demand whereas the Preferred Project assumes decreased surface water diversions as a result of increased groundwater pumping.

Figure 6: Annual Groundwater Pumping under Existing Conditions Baseline, No Project Scenarios, and Preferred Scenario

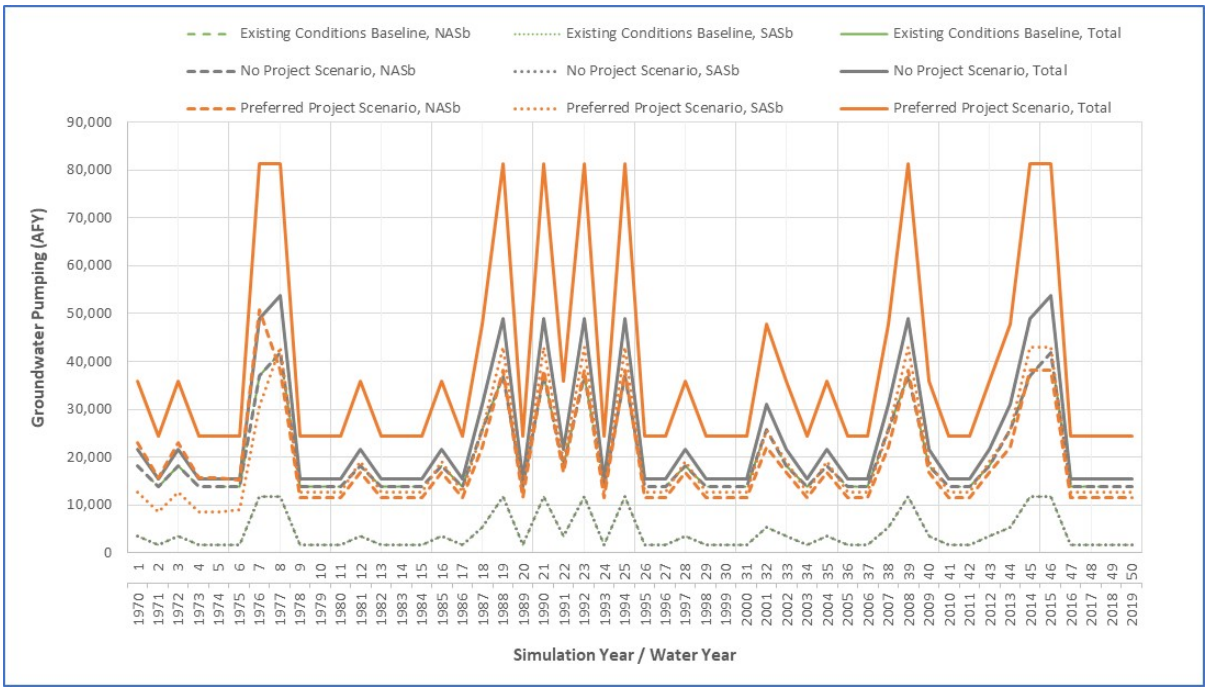


Figure 7: Existing Conditions Baseline Annual Groundwater Pumping

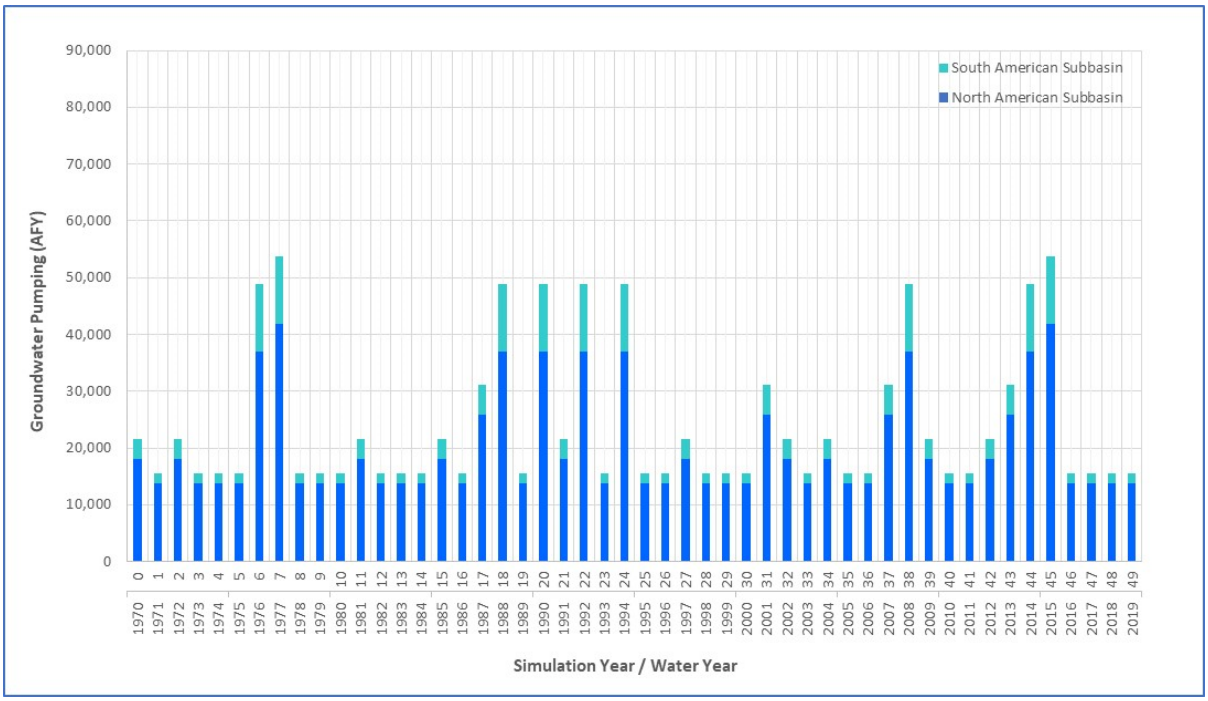


Figure 8: No Project Scenario Annual Groundwater Pumping

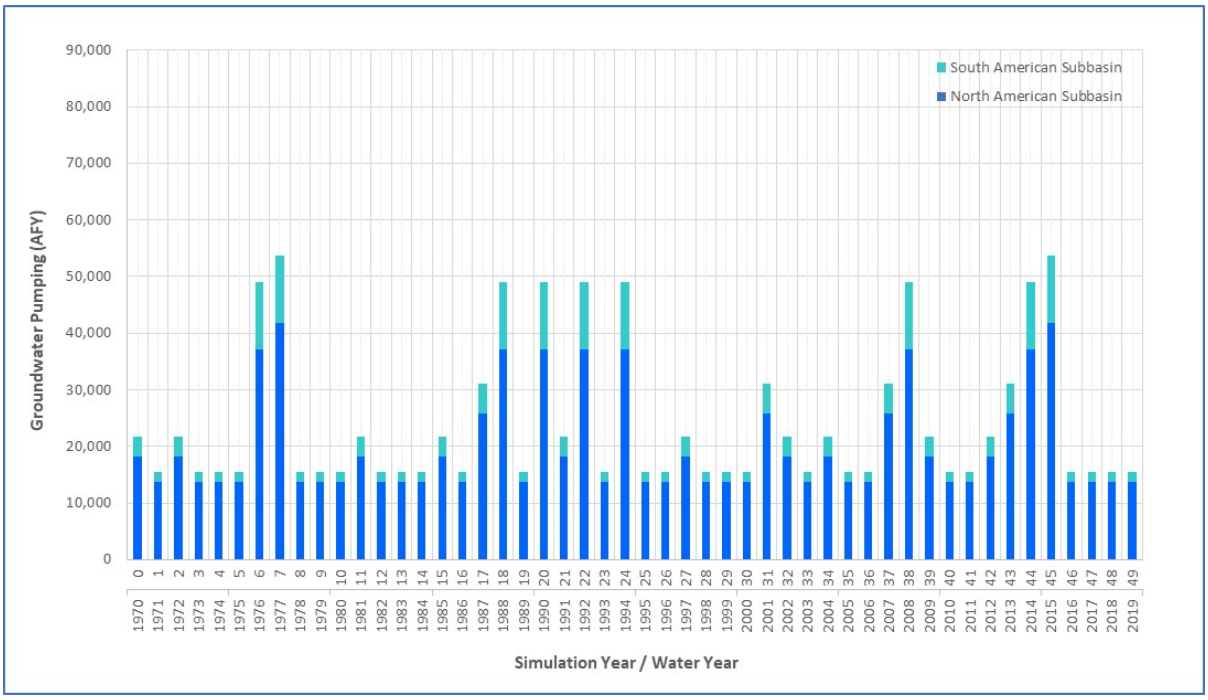
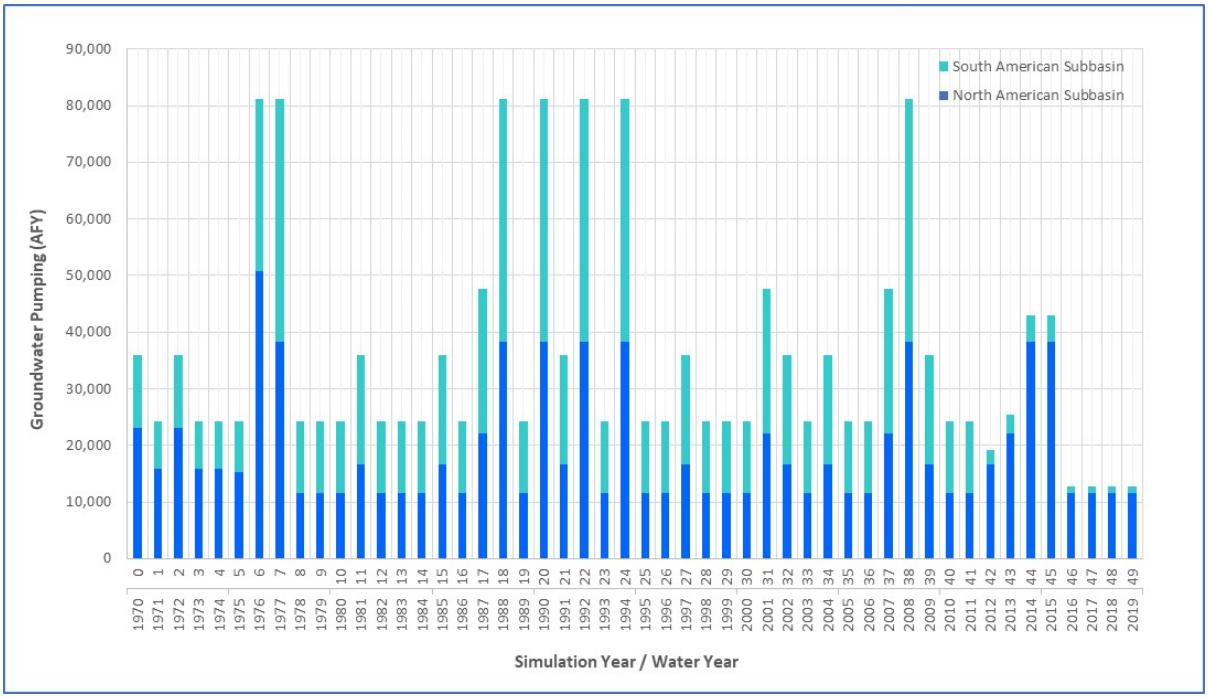


Figure 9: Preferred Project Scenario Annual Groundwater Pumping



3. MODELING ANALYSIS AND RESULTS

Modeling results from the Preferred Project Scenario are compared to the ECBL, No Project Scenario, and the GSP PCBL to assess potential changes to the groundwater basin due to the Project. The Project impacts are evaluated within the context of the GSP and the Preferred Project results are compared against the GSP PCBL. In addition, impact assessment is also conducted to evaluate if the Project is anticipated to cause undesirable conditions based on the SMC established by the GSP.

The results of the groundwater modeling scenarios are described in the following sections based on the following criteria evaluated:

- Annual average groundwater budget summary tables for the Preferred Project Scenario relative to the GSP PCBL in each subbasin
- Annual groundwater storage changes for the Preferred Project relative to the ECBL, No Project, and the GSP PCBL over the entire simulation period
- Average groundwater levels by water year types (Dry, Normal, and Wet years) compared to the SMC as set by the GSP for each respective subbasin at monitoring locations in the vicinity of the City
- Stream flows at the Sacramento and American Rivers under the ECBL, No Project and Preferred Project scenarios
- Stream seepage volumes compared to groundwater pumping and surface water diversions for the Preferred Project relative to the No Project
- Assessment of undesirable results per the GSP SMC in each subbasin at the GSP monitoring well sites established under each GSP

3.1 Groundwater Budget

Annual groundwater budget summary tables for the Preferred Project Scenario as compared to the GSP PCBL are described below for the North and South American Subbasins separately.

Overall, the modeling analysis for the proposed Project demonstrates small differences relative to the GSP PCBL with respect to the annual average groundwater budget conditions. Error! Reference source not found. summarizes the annual average groundwater budget components for the Preferred Project relative to the GSP PCBL for the North American Subbasin. The net change in groundwater pumping under the Preferred Project is 830 AFY compared to the GSP PCBL. This small difference is a result of the Project ramp up incorporated in the Preferred Project Scenario according to the well replacement schedule that shifts pumping from north to south. In response to this small pumping shift, groundwater storage is estimated to decrease by approximately 180 AFY and inflow from the South American Subbasin is increased by 210 AFY on average. In addition,

this shift in pumping results in a small increase in seepage and boundary inflows from surrounding subbasins, which are all less than 1% of the volumes in the GSP PCBL.

In the South American Subbasin, the modeling results are the reverse of those in the North American Subbasin where the groundwater pumping is decreased by 830 AFY and inflow from North American Subbasin is decreased by 210 AFY (**Table 8**). As a result of this small pumping decrease, stream seepage and boundary inflows from surrounding subbasins are decreased by less than 1% of the volumes in the GSP PCBL. On average, the groundwater storage is estimated to increase by a small amount of 10 AFY under the Project.

The results of the Project and GSP PCBL comparisons are most relevant within the context of the GSP assessment. Since GSP PCBL are already included in the GSP and the Project results are very similar to the GSP PCBL, the Project is not anticipated to cause unsustainable results with respect to the basin management, as demonstrated based on the groundwater budget results.

3.2 Groundwater Storage

Figure 10 shows comparison of groundwater storage changes in the North American Subbasin for the Project relative to ECBL, No Project, and GSP PCBL. The North American Subbasin shows an overall increasing trend in storage for all four scenarios. Similar to the groundwater budget results, storage changes in the North American Subbasin are similar for the Project, No Project, and GSP PCBL, which are lower than those in the ECBL. At the end of the simulation, increase in groundwater in storage reaches approximately 680,000 AF under ECBL compared to 300,000 AF under No Project, Project, and GSP PCBL.

In the South American Subbasin, the Project and GSP PCBL scenarios show similar trends of groundwater storage changes, which are lower than the ECBL and No Project. This is expected as a result of the higher Project pumping combined with pumping shift to south with the Well Replacement Program. At the end of the simulation, groundwater in storage reaches approximately 50,000 AF and 20,000 AF under ECBL and No Project, respectively, compared to a reduction in storage of approximately 100,000 AF under the Project, and GSP PCBL (**Figure 11**).

Table 7: North American Subbasin Annual Average Groundwater Budget - Preferred Project relative to GSP PCBL

North American Subbasin	Project [1] (AFY)	GSP PCBL [1] (AFY)	Difference [2] (Project - GSP PCBL)	% Difference [3]
Deep Percolation (+)	167,430	167,430	0	0%
Stream Seepage (+)	108,270	107,950	320	<1%
Recharge (+)	16,380	16,380	0	0%
Boundary Flow (+)	16,640	16,510	120	<1%
Groundwater Pumping (-)	324,000	323,170	830	<1%
Ag Pumping (-)	217,700	217,700	0	0%
M&I pumping (-)	106,300	105,470	830	<1%
Inflow from South American Subbasin (+)	5,530	5,320	210	4%
GW Storage Change (+)	5,210	5,390	-180	3%

(1) Absolute values for inflows are represented by positive sign (+) and outflows are represented by negative sign (-).
(2) Difference values represent conditions under the Project relative to the GSP PCBL.
(3) % differences are calculated relative to GSP PCBL.

Table 8: South American Subbasin Annual Average Groundwater Budget - Preferred Project relative to GSP PCBL

South American Subbasin	Project [1] (AFY)	GSP PCBL [1] (AFY)	Difference [2] (Project - GSP PCBL)	% Difference [3]
Deep Percolation (+)	121,360	120,310	50	0%
Stream Seepage (+)	105,090	105,670	-580	<1%
Recharge (+)	30	30	0	0%
Boundary Flow (+)	-810	-760	-50	6%
Groundwater Pumping (-)	233,170	234,000	-830	<1%
Ag Pumping (-)	104,860	104,860	0	0%
M&I pumping (-)	128,310	129,140	-830	<1%
Inflow from North American Subbasin (+)	-5,530	-5,320	-210	4%
Inflow from Cosumnes Subbasin (+)	4,290	4,320	-30	<1%
GW Storage Change (+)	-1,120	-1,130	10	<1%

(1) Absolute values for inflows are represented by positive sign (+) and outflows are represented by negative sign (-).
(2) Difference values represent conditions under the Project relative to the GSP PCBL.
(3) % differences are calculated relative to GSP PCBL.

Figure 10: North American Subbasin Groundwater Storage Change

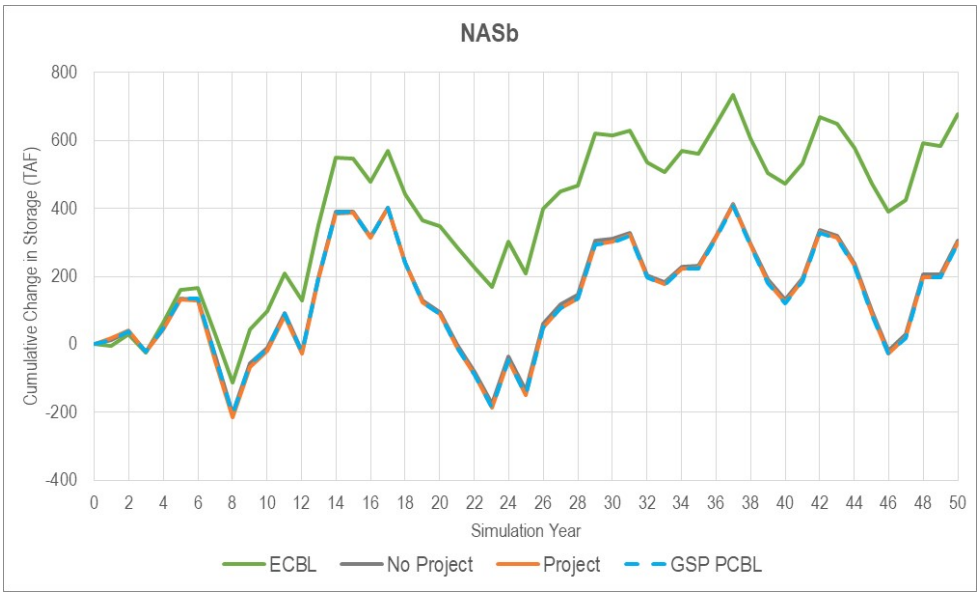
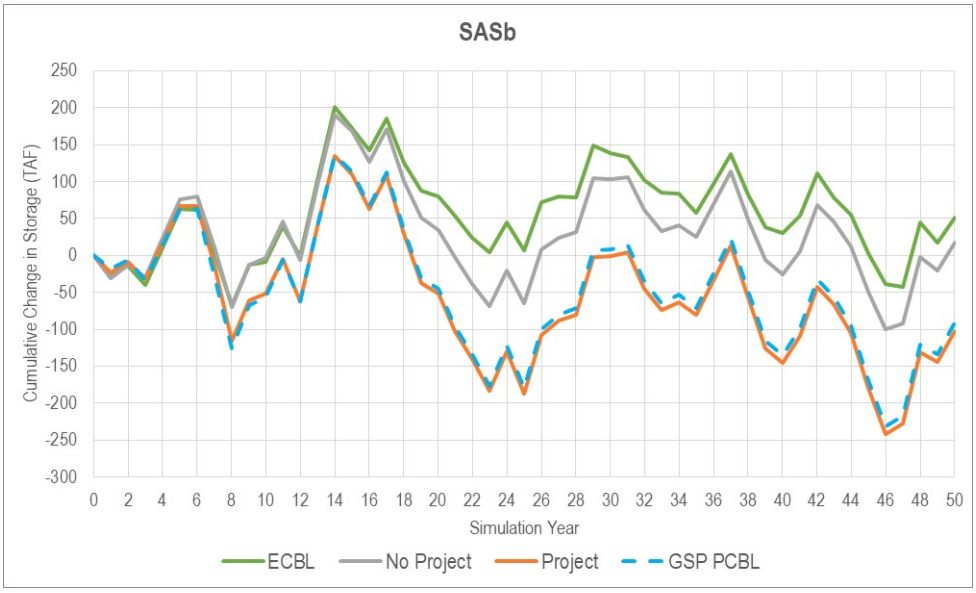


Figure 11: South American Subbasin Groundwater Storage Change



3.3 Groundwater Levels

Figure 12 shows the monitoring network established by the GSP of each subbasin, showing 41 representative monitoring sites (RMS) in the North American Subbasin and 45 representative monitoring points (RMP) in the South American Subbasin. Analysis of average groundwater levels mainly focuses on the monitoring wells within and near the City as the largest changes in groundwater elevations from the Project are anticipated to occur within the City's service area, while lesser changes in groundwater levels extending beyond the City's service area. Average groundwater levels estimated for the EIR scenarios are analyzed by water year types to assess the subbasin conditions under wet, normal, and dry hydrologic conditions. Results are compared against the GSP minimum threshold at each of the monitoring location. The minimum thresholds established for groundwater levels in the Project vicinity are presented in **Table 9** in the North American Subbasin and **Table 10** in the South American Subbasin.

Table 9: Minimum Thresholds for Groundwater Levels in North American Subbasin in the Project Area

Monitoring Site Number	Monitoring Site Local Name	Minimum Threshold (ft msl)
3	SGA_MW04	-5
11	Bannon Creek Park	-5
13	Chuckwagon Park	-15
22	AB-4 shallow	-1
24	SGA_MW02	-27
27	AB-3 shallow	-4
98	URS71000-700+00C	7

Table 10: Minimum Thresholds for Groundwater Levels in South American Subbasin in the Project Area

Monitoring Site	Minimum Threshold (ft msl)
RMP_14	-18
RMP_19	-23
RMP_24(a)	-12
RMP_27	-50
RMP_29	-5
RMP_30(a)	-41
RMP_33(a)	-5
RMP_34(a)	-6
RMP_35(a)	-8
RMP_37(a)	1

In this analysis, results of the EIR scenarios are also compared against the GSP CCBL and GSP Conjunctive Use with Climate Change (GSP CU_CC) scenario that were both used in the minimum threshold settings under each GSP.

Figure 12: Monitoring Network Wells under GSP

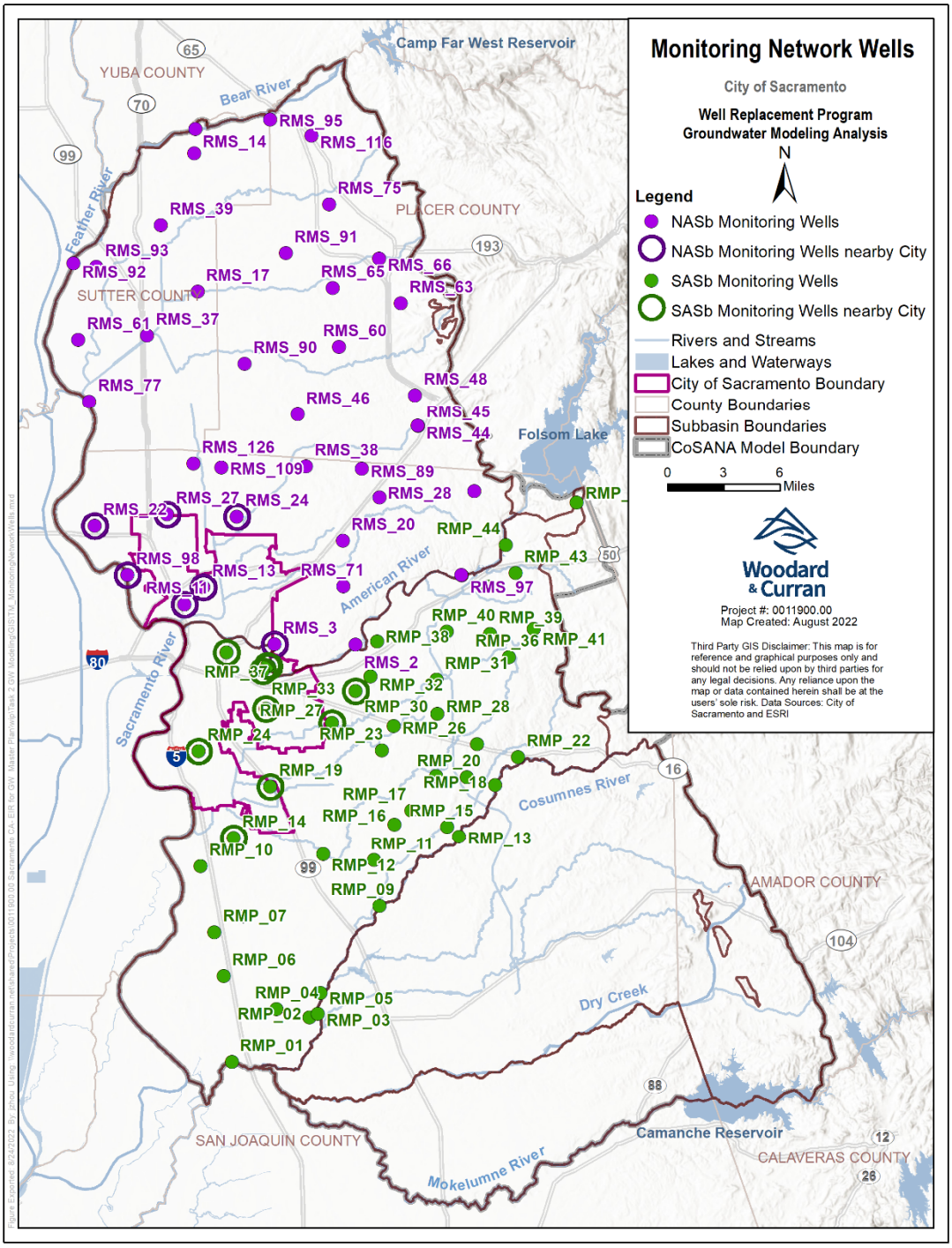


Figure 13 shows the average groundwater levels at seven RMSs (3, 11, 13, 22, 24, 27, and 98) located in and near the City in the North American Subbasin. Overall, hydrologic conditions are shown to have an effect on groundwater elevations. Groundwater elevations are typically higher during wet periods than during normal periods, and dry periods generally show the lowest groundwater elevations. Results for the ECBL are generally similar to the GSP CCBL, as expected, as the ECBL was built of the GSP CCBL. In addition, the Project Scenario shows similar trends as in the GSP CU_CC scenario given the Project was already incorporated in this scenario. All five scenarios analyzed show average groundwater levels above the minimum thresholds at all seven monitoring locations.

The results in the South American Subbasin follow similar trends by water year types as shown at 10 RMPs (14, 19, 24, 27, 29, 30, 33, 34, 35, and 37) except in the monitoring locations near the Sacramento River with similar groundwater levels regardless of hydrologic conditions. Similar to the North American Subbasin, all five scenarios analyzed show average groundwater levels above the minimum thresholds at all 10 monitoring locations, as shown in **Figure 14a** and **Figure 14b**.

Figure 13: North American Subbasin Average Groundwater Levels by Water Years

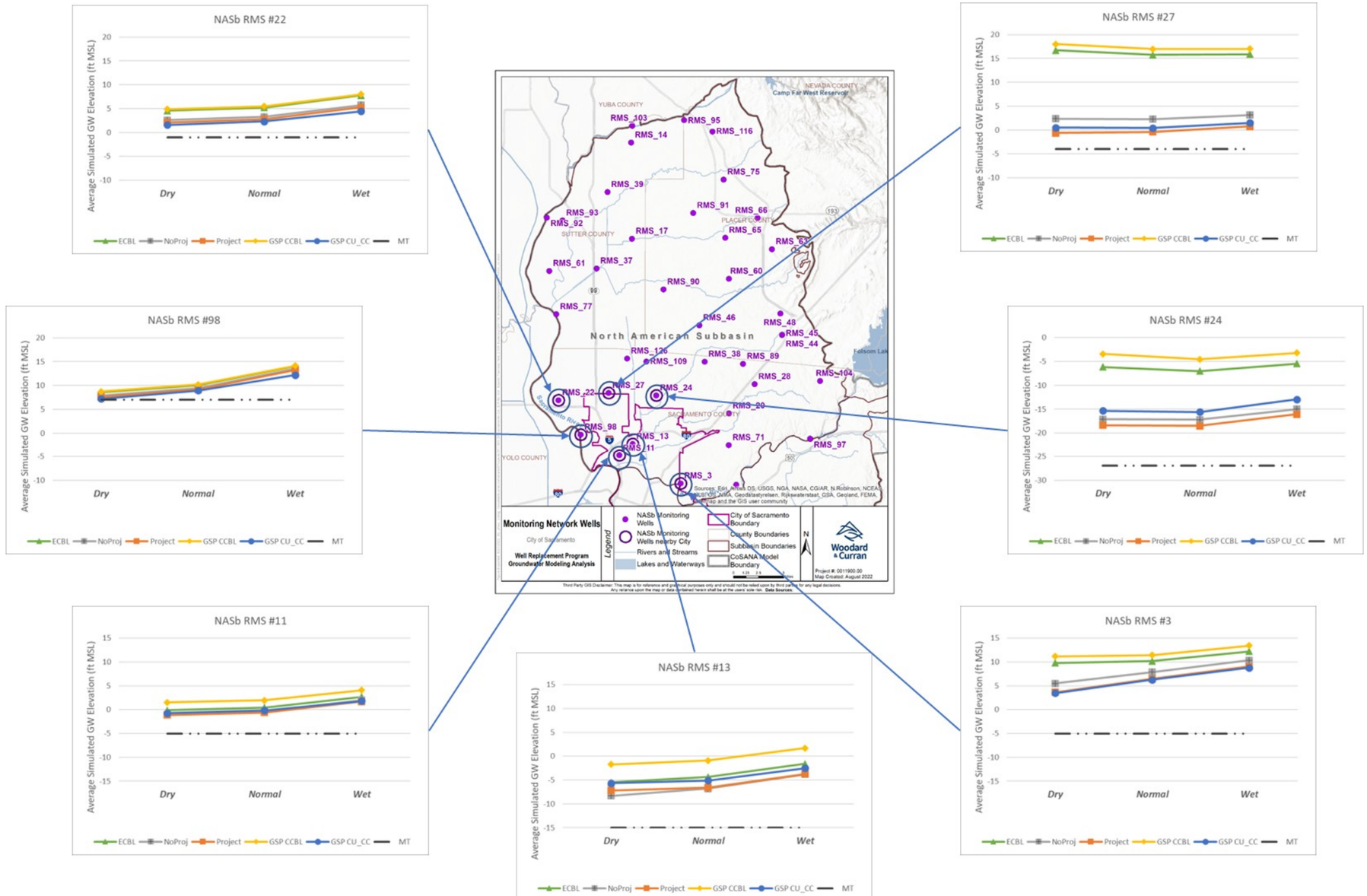


Figure 14a: South American Subbasin Average Groundwater Levels by Water Years

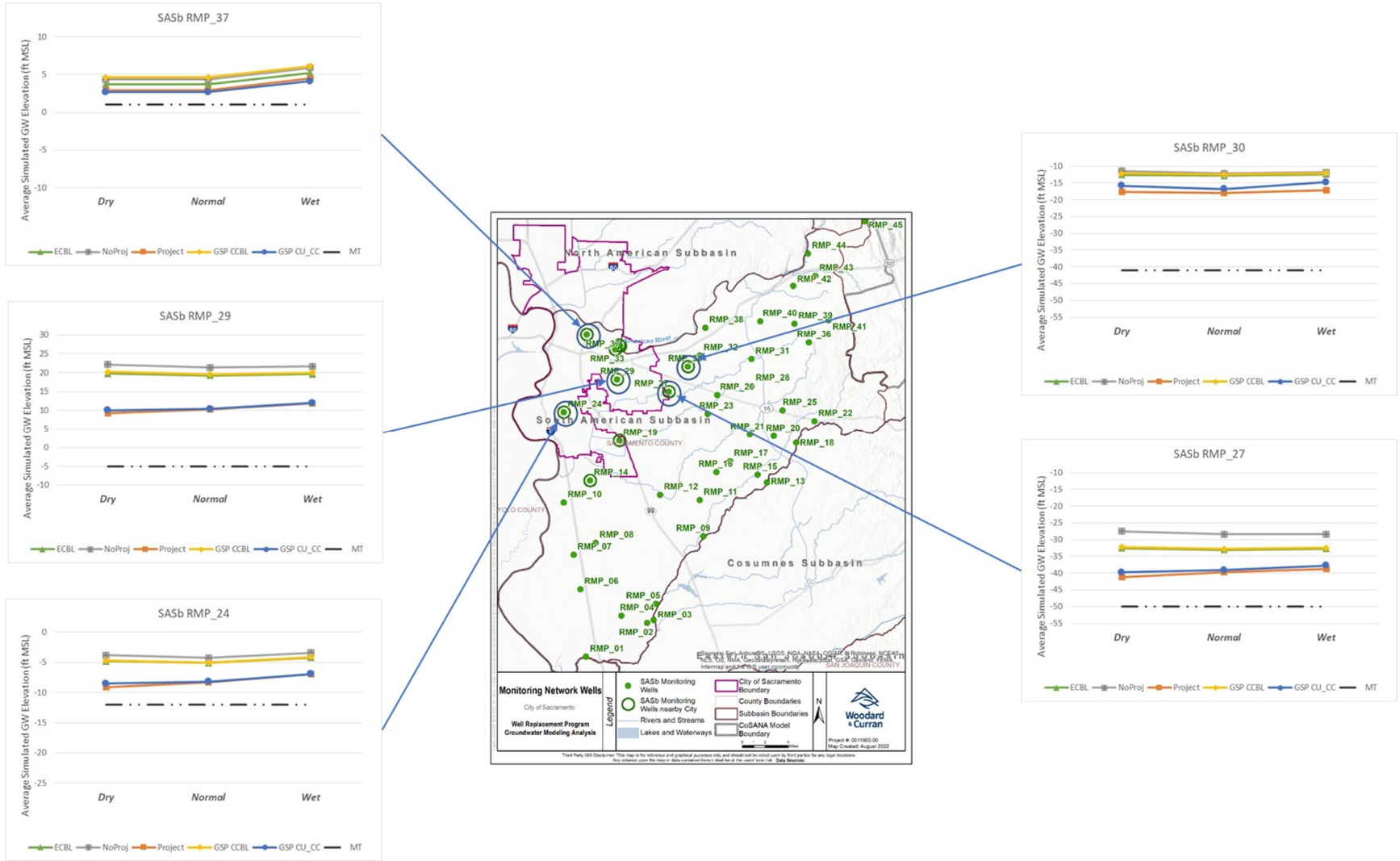
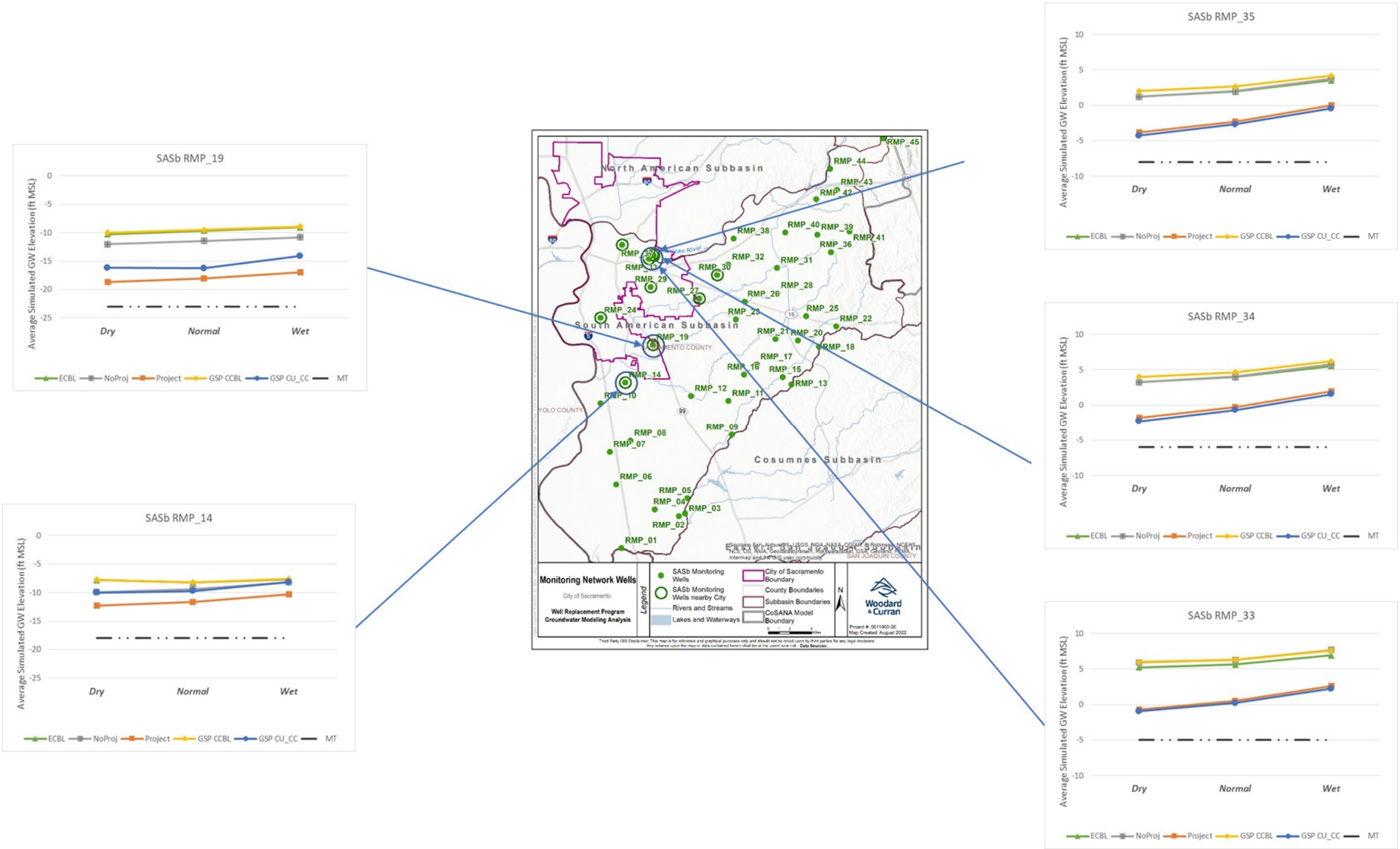


Figure 15b: South American Subbasin Average Groundwater Levels by Water Years



3.4 Stream Flows

Stream flows at the Sacramento River at Freeport and American River at H Street Bridge are analyzed for the Preferred Project relative to the ECBL and No Project. **Figure 16** shows the locations of the stream flow hydrographs. **Figure 17** and **Figure 18** show exceedance charts with the percentage of time that daily streamflow is exceeded. Overall, stream flows are similar under all three scenarios, but a small difference is anticipated in low flow conditions (**Figure 19** and **Figure 20**).

3.5 Stream Seepage

Figure 21 shows annual change in the City's urban pumping and resulting change in stream seepage over the simulation period for the Preferred Project relative to No Project. This represents changes in the City's total pumping in the two subbasins combined and total stream seepage estimated in the entire model domain. As described earlier as part of the groundwater budget results, the City's urban pumping under the Project results in stream seepage compared to No Project; however, seepage is anticipated to be a smaller fraction compared to the increase in groundwater pumping.

The proposed Project is anticipated to provide significant benefits to the streams compared to the stream seepage. **Figure 22** shows the cumulative change in seepage and cumulative reduction in the City's surface water deliveries under the Preferred Project compared to No Project. This clearly demonstrates that the Project is anticipated to contribute a significant volume of stream flows available for downstream users under the Project. At the end of the simulation period, the net increase in the stream flows, after the stream seepage is taken into account, is anticipated to be 200,000 AF as a result of the City's Project implementation and reduction in surface water diversions.

Figure 16: Stream Flow Hydrograph Locations

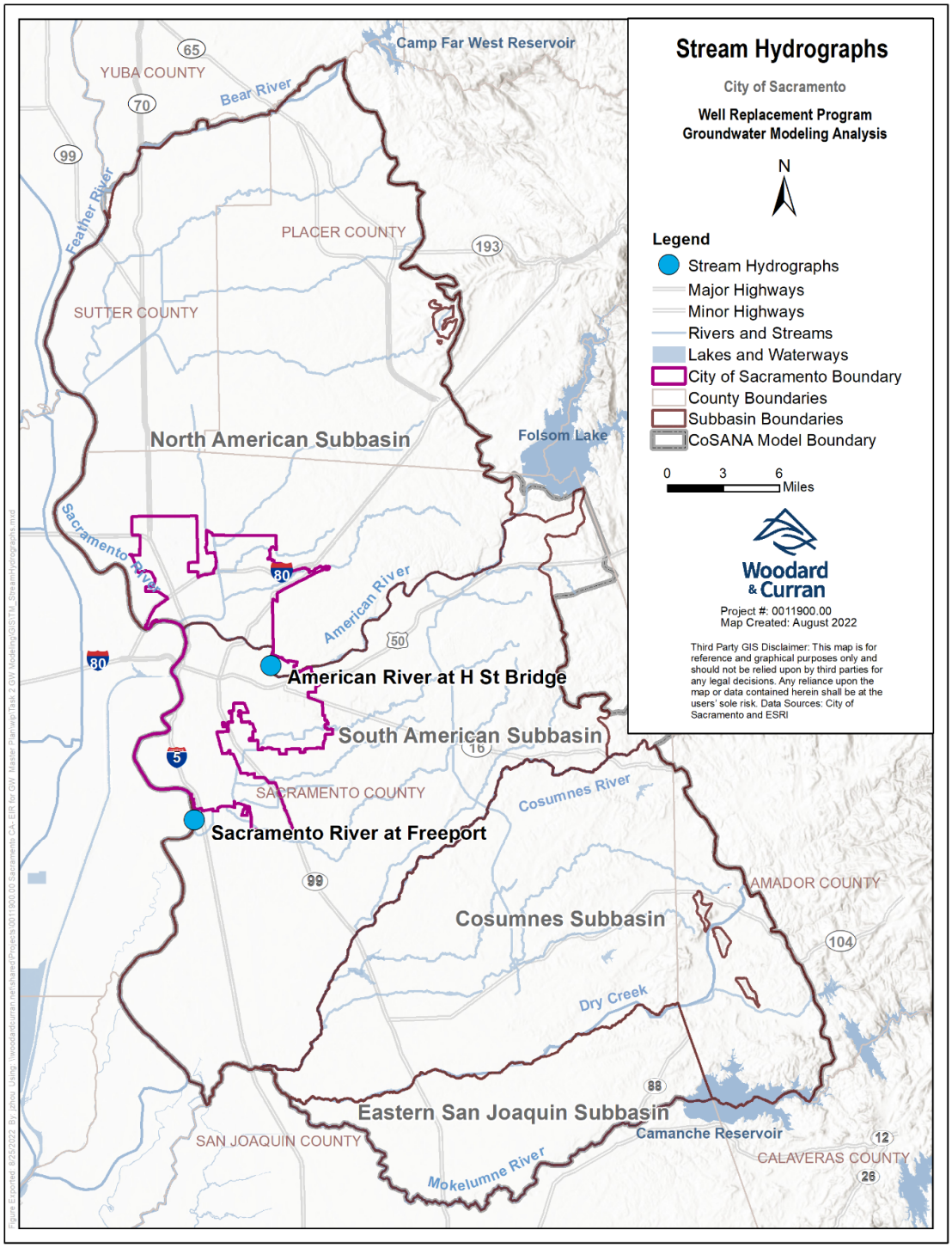


Figure 17: Sacramento River Flows at Freeport

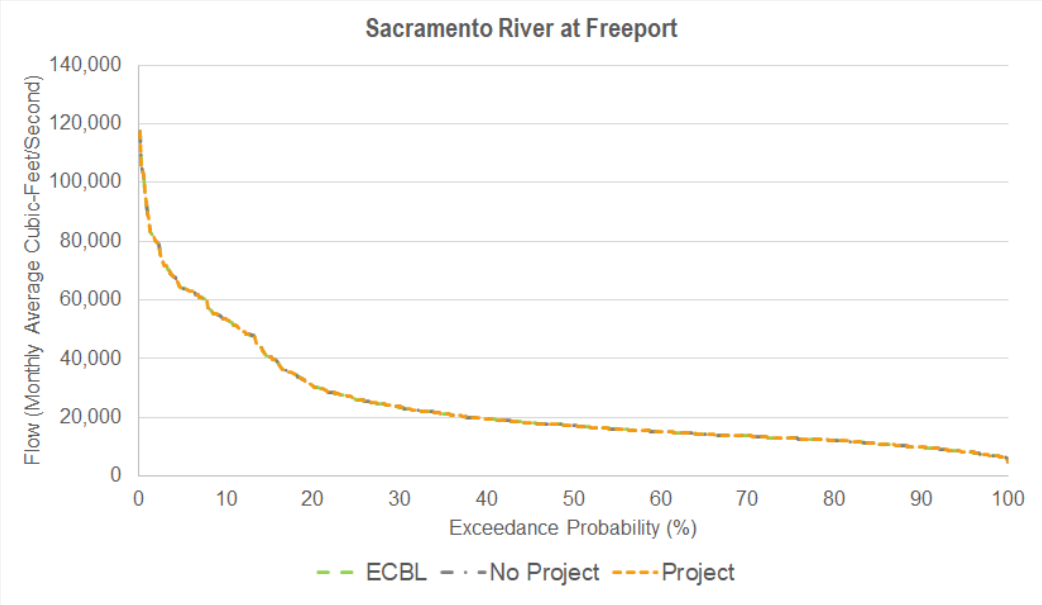


Figure 18: American River Flows at H Street Bridge

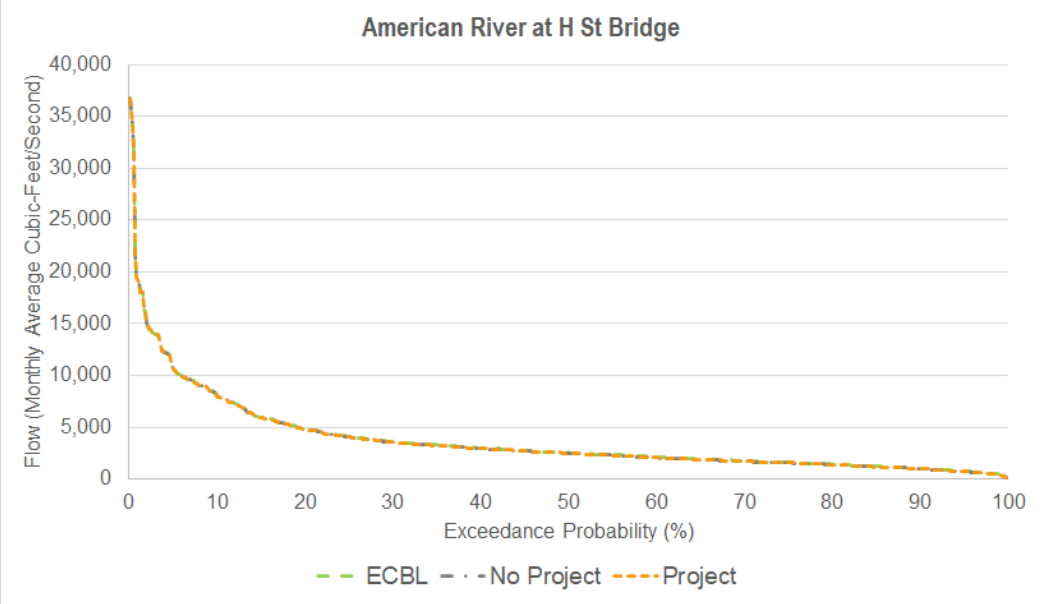


Figure 19: Sacramento River Flows at Freeport during Low Flow Conditions

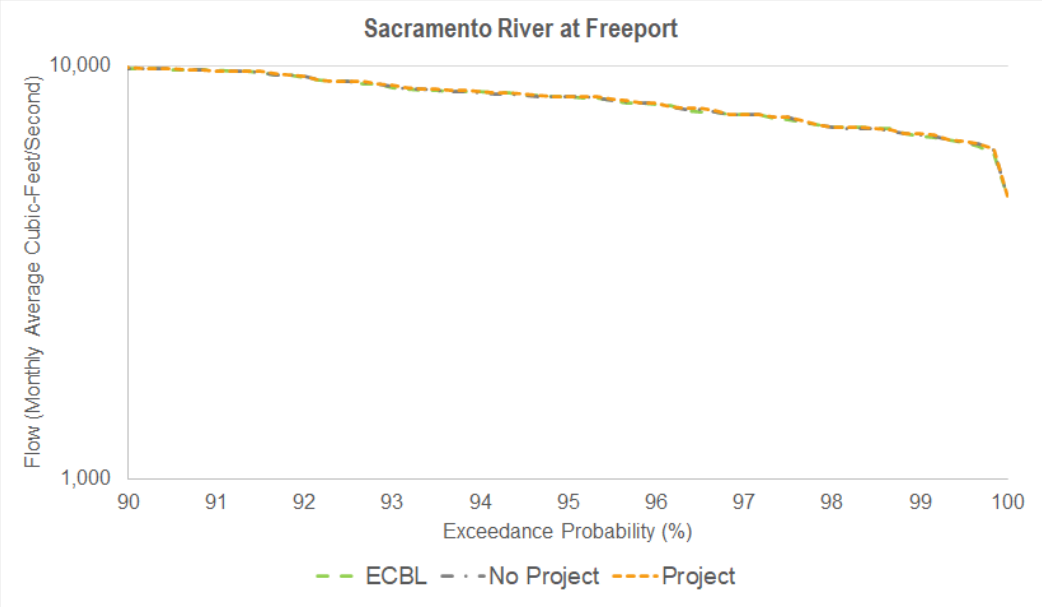


Figure 20: American River Flows at H Street Bridge during Low Flow Conditions

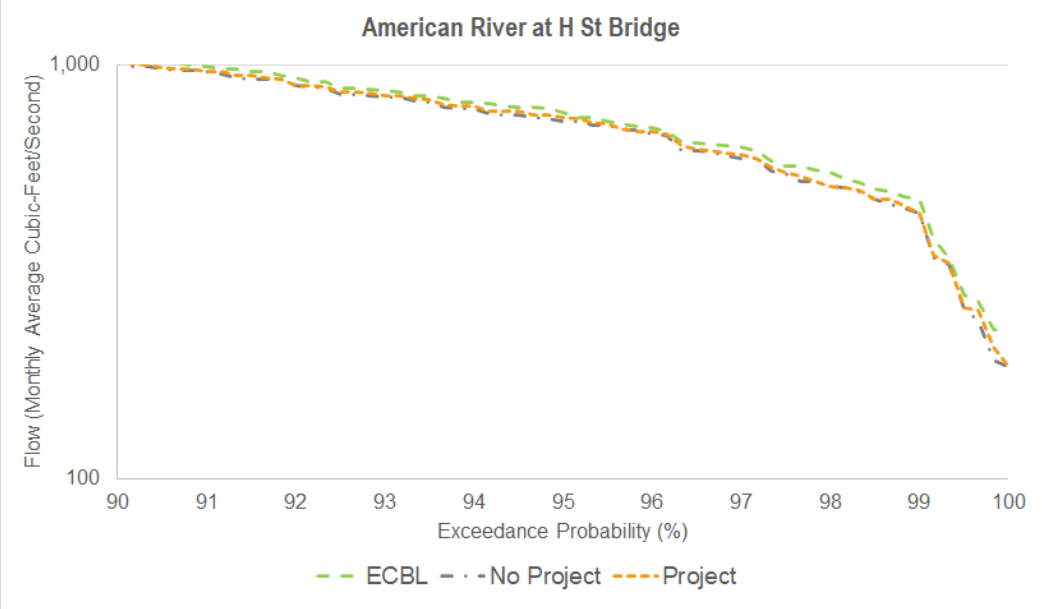


Figure 21: Annual Change in Stream Seepage and Urban Pumping

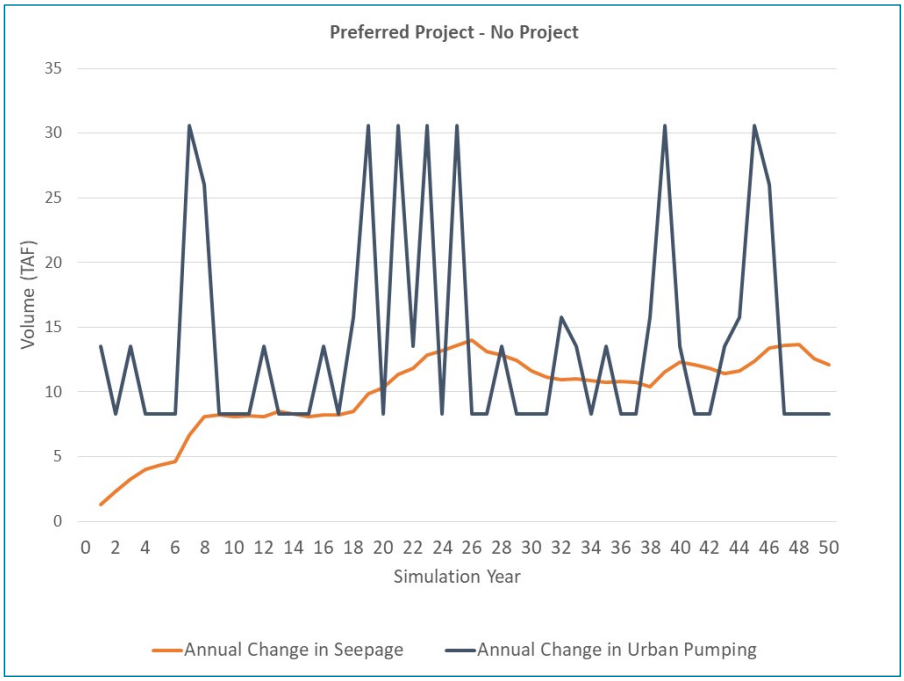
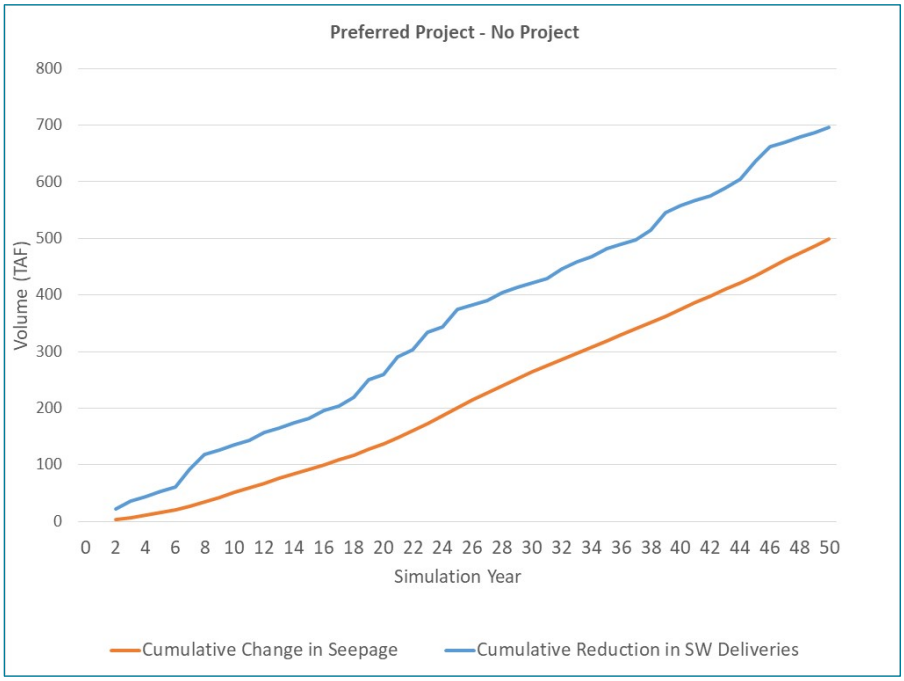


Figure 22: Cumulative Change in Stream Seepage and Cumulative Reduction in Surface Water Deliveries



3.6 Analysis of Undesirable Results per GSP

The North American Subbasin and South American Subbasin are both designated as high priority groundwater basins under the SGMA that was enacted in January 2015. Each GSP is currently adopted and submitted to DWR. Each GSP defines SMC, including minimum thresholds (MTs), to prevent significant and unreasonable impacts on the sustainability indicators defined by SGMA. Under each GSP, SMC were developed for five of the six SGMA sustainability indicators[1]: chronic lowering of groundwater levels, reduction of groundwater storage, land subsidence, degradation of water quality, and surface water depletion.

The modeling results under the ECBL, No Project, and Preferred Project scenarios are analyzed in the context of the GSP SMC to assess the undesirable conditions. All of the 41 representative monitoring well sites in the North American Subbasin and 45 representative monitoring points for the South American Subbasin are considered in the analysis and the Project impacts are considered significant if the following conditions would occur:

- 20 percent or more of all North American Subbasin representative monitoring sites have minimum thresholds exceedances for two (2) consecutive Fall season measurements (8 out of 41 wells)
- More than 25 percent of representative monitoring wells in the South American Subbasin fall below the minimum threshold for three (3) consecutive years (12 out of 45 wells)

Consistent with the undesirable results in the SMC of each GSP, exceedances of minimum thresholds under the Preferred Project are used as an indication of significant and undesirable results.

Table 11 presents the number of exceedances and years of exceedances at all GSP monitoring wells over the entire 50-year simulation (water years 1970 through 2019). As demonstrated by the modeling analysis, the Preferred Project does not result in undesirable conditions per the GSPs for both the North American and South American Subbasins. Therefore, the proposed Project is expected to maintain sustainable basin conditions according to SGMA.

[1] The sixth indicator is seawater intrusion; it has not occurred in the past and is unlikely to occur during the GSP planning horizon. Therefore, sustainability criteria were not established for the seawater intrusion sustainability indicator as it is not applicable based on the City's inland location.

Table 11: Assessment of Undesirable Results per GSP Sustainable Management Criteria

North American Subbasin *Undesirable condition defined as 20% or more monitoring wells exceeding MTs for two (2) consecutive fall measurements*					
No. of Exceedances	**% of Wells**	**Years of Exceedances**	**No. of Years of Exceedances**	**Undesirable Condition**	**Description**
8	20	1991	1	No	4 wells within the City and nearby areas
7	17	1992 - 1994	3	No	3 wells within the City and nearby areas
South American Subbasin *Undesirable condition defined as 25% or more monitoring wells exceeding MTs for three (3) consecutive years*					
No. of Exceedances	**% of Wells**	**Years of Exceedances**	**No. of Years of Exceedances**	**Undesirable Condition**	**Description**
8	18	2014 - 2016	3	No	4 wells within the City and nearby areas
8	18	1992 - 1995	4	No	5 wells within the City and nearby areas

4. CONCLUSION

The City's Well Replacement Program is included within both the North American and South American Subbasin GSPs under the GSP PCBL scenario. The proposed Project and the GSP PCBL scenarios represent similar conditions. Therefore, the proposed Project is not expected to impact the sustainable management of either subbasin according to SGMA. The modeling analysis further demonstrates that the Project is not anticipated to cause undesirable results based on the GSP SMC, as briefly explained below:

- The modeling analysis for the proposed Project indicates less than significant differences relative to the GSP PCBL with respect to the annual average groundwater budget conditions (**Tables 7** and **8**).
- The Project is expected to provide a net positive benefit to streams as the volume of surface water that is not diverted under the Project is significantly greater than the additional stream seepage to the groundwater system under the Project (**Figure 22**).
- The modeling analysis demonstrates that the average groundwater levels under the proposed Project are above the minimum thresholds set by the respective GSP in each subbasin based on the results at the GSP monitoring well sites in the vicinity of the City (**Figures 13** and **14**). While the GSP monitoring wells outside of the City's potential influence area are not anticipated to be affected by the project implementation and they are anticipated to remain as projected in the GSP analysis, they are included in the assessment of the undesirable conditions (**Table 11**).

- Based on the modeling analysis of groundwater levels over time, the proposed Project is not expected to result in undesirable results per the GSP SMC established at all of the GSP monitoring well sites in each subbasin (**Table 11**).

In summary, the groundwater modeling analysis performed for the EIR:

- Indicates groundwater impact assessment results are consistent with the groundwater sustainability analysis performed and analyzed under the GSP (e.g., PCBL)
- Results in no significant impacts to groundwater conditions
- Meets the SMC criteria as set forth in the respective GSPs and does not result in undesirable conditions with respect to the GSP sustainability criteria

Results from the EIR groundwater modeling analysis demonstrate that the proposed Project is expected to comply with the sustainability goals of the North American and South American Subbasins per the GSPs, and is not expected to result in undesirable conditions with respect to the minimum thresholds established in the North American and South American Subbasins.

APPENDIX F - RCNM NOISE CALCULATION SHEETS

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/28/2020
Case Description: City Sacramento Groundwater Master Plan EIR

		Baselines (dBA)			---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night	
Residences-Los Robles Blvd	Residential	60	50	40	

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0
Auger Drill Rig	No	20		84.4	50	0
Flat Bed Truck	No	40		74.3	50	0
Pumps	No	50		80.9	50	0
Welder / Torch	No	40		74	50	0
Flat Bed Truck	No	40		74.3	50	0
Flat Bed Truck	No	40		74.3	50	0
Flat Bed Truck	No	40		74.3	50	0

			Results											
	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auger Drill Rig	84.4	77.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	74.3	70.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	80.9	77.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74	70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	74.3	70.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	74.3	70.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	74.3	70.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.4	82.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/5/2022
Case Description: City Sacramento Groundwater Master Plan EIR

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences	Residential	60	50	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Auger Drill Rig	No	20		84.4	100	0
Compressor (air)	No	40		77.7	100	0
Pumps	No	50		80.9	100	0
Welder / Torch	No	40		74	100	0
Flat Bed Truck	No	40		74.3	100	0
Flat Bed Truck	No	40		74.3	100	0
Flat Bed Truck	No	40		74.3	100	0
Flat Bed Truck	No	40		74.3	100	0

				Results											
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Auger Drill Rig		78.3	71.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		71.6	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		74.9	71.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		68	64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		68.2	64.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		68.2	64.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		68.2	64.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		68.2	64.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	78.3	76.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/5/2022
Case Description: City Sacramento Groundwater Master Plan EIR

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences	Residential	60	50	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Auger Drill Rig	No	20		84.4	200	0
Compressor (air)	No	40		77.7	200	0
Pumps	No	50		80.9	200	0
Welder / Torch	No	40		74	200	0
Flat Bed Truck	No	40		74.3	200	0
Flat Bed Truck	No	40		74.3	200	0
Flat Bed Truck	No	40		74.3	200	0
Flat Bed Truck	No	40		74.3	200	0

		Results													
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Auger Drill Rig		72.3	65.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		65.6	61.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		68.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		62	58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	72.3	70.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/5/2022
Case Description: City Sacramento Groundwater Master Plan EIR

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences	Residential	60	50	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Auger Drill Rig	No	20		84.4	300	0
Compressor (air)	No	40		77.7	300	0
Pumps	No	50		80.9	300	0
Welder / Torch	No	40		74	300	0
Flat Bed Truck	No	40		74.3	300	0
Flat Bed Truck	No	40		74.3	300	0
Flat Bed Truck	No	40		74.3	300	0
Flat Bed Truck	No	40		74.3	300	0

			Results											
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)				
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Auger Drill Rig		68.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		62.1	58.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		65.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		58.4	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.8	67.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/5/2022
Case Description: City Sacramento Groundwater Master Plan EIR

		Baselines (dBA)			---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night	
Residences	Residential	60	50	40	

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Auger Drill Rig	No	20		84.4	400	0
Compressor (air)	No	40		77.7	400	0
Pumps	No	50		80.9	400	0
Welder / Torch	No	40		74	400	0
Flat Bed Truck	No	40		74.3	400	0
Flat Bed Truck	No	40		74.3	400	0
Flat Bed Truck	No	40		74.3	400	0
Flat Bed Truck	No	40		74.3	400	0

		Results													
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Auger Drill Rig		66.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		59.6	55.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		62.9	59.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		55.9	52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.3	64.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/5/2022
Case Description: City Sacramento Groundwater Master Plan EIR

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences	Residential	60	50	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Auger Drill Rig	No	20		84.4	50	15
Compressor (air)	No	40		77.7	50	15
Pumps	No	50		80.9	50	15
Welder / Torch	No	40		74	50	15
Flat Bed Truck	No	40		74.3	50	15
Flat Bed Truck	No	40		74.3	50	15
Flat Bed Truck	No	40		74.3	50	15
Flat Bed Truck	No	40		74.3	50	15

				Results											
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Auger Drill Rig		69.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		62.7	58.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		59	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck		59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	69.4	67.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2022
Case Description: City Sacramento Groundwater Master Plan EIR - operations

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential	Residential	60	50	40

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Pumps	No	50		80.9	50	10
Pumps	No	50		80.9	50	10

				Results											
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps		70.9	67.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		70.9	67.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	70.9	70.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/1/2022
Case Description: City Sacramento Groundwater Master Plan EIR - operations

		---- Receptor #1 ----		
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential	Residential	60	50	40

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pumps	No	50		80.9	150	3
Pumps	No	50		80.9	150	3

		Results													
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Pumps		68.4	65.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pumps		68.4	65.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.4	68.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

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