APPENDIX E

PROPOSED RECLAMATION NARRATIVE AND HABITAT RESTORATION PLAN

REVISED RECLAMATION PLAN
FOR THE
CACHE CREEK MINE
(MINE ID # 91-57-0008)

Operator:

CEMEX Construction Materials Pacific, LLC.
2365 Iron Point Road, Suite 120
Folsom, CA 95630

Prepared by:

Compass Land Group
3140 Peacekeeper Way, Suite 102
McClellan, CA 95652

November 2022

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SMARA Statutes (California PRC Sections 2772, 2773 and 2773.3)			
2772(b)	Chart of contents	vi (this chart)	☐ YES ☐ NO ☐ N/A
2772(c)(1)	Operator and agent contact info	1, 4	☐ YES ☐ NO ☐ N/A
2772(c)(2)	Quantity and type of materials	4	☐ YES ☐ NO ☐ N/A
2772(c)(3)	Initiation and termination dates	4	☐ YES ☐ NO ☐ N/A
2772(c)(4)	Maximum anticipated depth	5, Sheet M-07	☐ YES ☐ NO ☐ N/A
2772(c)(5)	Reclamation plan maps	5, Sheets M-03, R-01 thru R-15	☐ YES ☐ NO ☐ N/A
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2772(c)(7)	Proposed or potential end uses	8, Sheet R-03	☐ YES ☐ NO ☐ N/A
2772(c)(8)	Reclamation description	8-9, 16-35	☐ YES ☐ NO ☐ N/A
2772(c)(9)	Effect on future mining in area	10	☐ YES ☐ NO ☐ N/A
2772(c)(10)	Statement of responsibility	35, Appendix J	☐ YES ☐ NO ☐ N/A
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2773.3	Requirements for metallic mines	N/A	☐ YES ☐ NO ☐ N/A
SMARA Regulations, Article 1, Surface Mining and Reclamation Practice (Title 14, California CCR §3500 et seq.)			
3502(a)	Reclamation objectives	1-3, 8-9	☐ YES ☐ NO ☐ N/A
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3502(b)(3)	Final slopes	16-17, Appendix F	☐ YES ☐ NO ☐ N/A
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3502(b)(5)	Disposition of old equipment	34	☐ YES ☐ NO ☐ N/A
3502(b)(6)	Stream and watershed diversions	20	☐ YES ☐ NO ☐ N/A
3503(a)	Soil erosion control	18-20	☐ YES ☐ NO ☐ N/A
3503(b)	Water quality / watershed control	17-20	☐ YES ☐ NO ☐ N/A
3503(c)	Protection of fish / wildlife habitat	21	☐ YES ☐ NO ☐ N/A
3503(d)	Disposal of waste / overburden	20	☐ YES ☐ NO ☐ N/A
3503(e)	Erosion and drainage	18-20	☐ YES ☐ NO ☐ N/A
3503(f)	Resoiling	21-23, Appendix H	☐ YES ☐ NO ☐ N/A
3503(g)	Revegetation	23-33, Appendix H	☐ YES ☐ NO ☐ N/A
SMARA Regulations, Article 9, Reclamation Standards (Title 14, California CCR §3700 et seq.)			
3703	Wildlife and habitat protection	21, Appendix A	☐ YES ☐ NO ☐ N/A
3704	Backfill, grading and slopes	16-17	☐ YES ☐ NO ☐ N/A
3704.1	…for metallic mines	N/A	☐ YES ☐ NO ☐ N/A
3705	Revegetation	23-33, Appendix H	☐ YES ☐ NO ☐ N/A
3706	Water quality, drainage, runoff	17-20	☐ YES ☐ NO ☐ N/A
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3710	Surface / groundwater protection	17-20	☐ YES ☐ NO ☐ N/A
3711	Topsoil salvage and redistribution	21-23, Appendix H	☐ YES ☐ NO ☐ N/A
3712	Mine waste disposal	20	☐ YES ☐ NO ☐ N/A
3713	Drill holes and water wells	35	☐ YES ☐ NO ☐ N/A

RECLAMATION PLAN SUMMARY

Mine Name:	Cache Creek Mine
California Mine ID Number:	91-57-0008
Mine Operator:	CEMEX Construction Materials Pacific, LLC.
Mine Location:	30288 CA-16 Woodland, CA 95653 Latitude 38.69^{o} and Longitude -121.94^{o}
Site Contact:	Steve Grace
Contact Phone:	831.970.9559
Property Owner(s):	CEMEX Construction Materials Pacific, LLC.
Address:	2365 Iron Point Road Folsom, CA 95630
Contact Person:	Oscar Frias, VP Planning & Administration – West Region
Contact Phone:	602.416.2912
Assessor Parcel(s):	025-450-001, 049-060-004 & -007, 049-070-004, -005, -006, -009, -010, -011, -019, -020, -021
Total Parcel Size(s):	1,902± acres
Area to be Reclaimed:	816± acres
Type of Material to be Mined:	Sand and gravel
Quantity of Material to be Mined:	30 million tons (mined), 26 million tons (sold)
Maximum Anticipated Depth:	70 feet below ground surface (“bgs”)
Maximum Anticipated Floor Elev:	64 feet mean sea level (“msl”)
Proposed Initiation Date:	Site is already active
Proposed Termination Date:	Est. August 11, 2047
Potential End Use(s):	Agriculture, permanent lakes, and wildlife habitat

1.0 INTRODUCTION

This Revised Reclamation Plan ("Plan") has been prepared in support of the continuation of surface mining and reclamation activities at the CEMEX Construction Materials Pacific, LLC. ("CEMEX") Cache Creek Mine ("Mine") in Yolo County, California. The Mine is located at 30288 CA-16, near the town of Madison, California in an unincorporated portion of the County (see Figure 1, Site Vicinity Map, and Figure 2, Existing Conditions Aerial Photograph).

Surface mining is planned to continue on ±470 acres and reclamation is planned to occur on ±816 acres (including formerly mined areas) on 12 parcels totaling ±1,902 acres, with the remainder left undisturbed (see Sheets M-01 through M-15 and R-01 through R-15). The Mine is planned to be developed and ultimately reclaimed in six phases, the first two of which have already been mined but not fully reclaimed. The planned end uses for the Mine are agriculture, permanent lakes and wildlife habitat (generally consistent with the original reclamation plan).

Consistent with the Surface Mining and Reclamation Act ("SMARA") Public Resources Code ("PRC") §2712, this Revised Plan has been developed to assure that:

(a) Adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses.

(b) The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.

(c) Residual hazards to the public health and safety are eliminated.

While the purpose of this Plan is to describe reclamation activities, the surface mining activities (e.g., excavation, overburden handling, and transport) are also described and referenced throughout for contextual purposes.

1.1 Plan Organization

Section 2.0 of this Plan provides an overview of reclamation activities and is generally organized around SMARA requirements, beginning with SMARA's key statutory requirements. Section 3.0 of this Plan addresses specific Yolo County ("County" or "lead agency") requirements, where those requirements supplement or amplify the requirements covered in Section 2.0.

This Plan has been prepared pursuant to the following requirements associated with the reclamation of mined lands:

- California Surface Mining Reclamation Act of 1975, as amended (Public Resource Code §2710 et seq.);
- State Mining and Geology Board implementing regulations (California Code of Regulations, Title 14, §3500 et seq.);

- Yolo County General Plan and Zoning Code; and
- Yolo County Off-Channel Mining Plan ("OCMP") including its Off-Channel Surface Mining Ordinance ("OCSMO") and Surface Mining Reclamation Ordinance ("SMRO").

This Plan has also been prepared in consideration of the most recent 2021 Cache Creek Annual Status Report prepared by the County's Cache Creek Technical Advisory Committee ("TAC"), which was received and filed by the County Board of Supervisors on February 8, 2022. The annual report serves as a regular opportunity for the TAC to take a larger perspective in looking at the creek and at the County's Cache Creek Resource Management Plan ("CCRMP") with a critical eye for improvement. The process is designed to be adaptive, so that monitoring requirements and management techniques can appropriately address the ever-changing riparian environment along Cache Creek. For example, the annual report contains the TAC's current observations and information related to biological resources and channel dynamics, which are important factors for reclamation and restoration projects.

Many statutory and regulatory sections of SMARA are either presented verbatim or summarized to facilitate a better understanding of plan contents and requirements. Requirements found in Article 1 (14 CCR §3500 *et seq.*) and Article 9 (14 CCR §3700 *et seq.*) of SMARA's implementing regulations are addressed under combined resource headings where possible, to minimize duplication of plan contents. SMARA citations and standards that follow section headings in *italics* have been abbreviated.

1.2 Purpose for Revised Reclamation Plan

This Revised Reclamation Plan provides for:

1. The continuation of mining on ±470 acres with reclamation on ±816 acres;
2. A change in mining phases to allow an electric dredge to efficiently move between mining phases without the need to disassemble and reassemble the dredge equipment, and establish a new settling pond for deposition of process fines;
3. A minor change to the approved mining and reclamation plan footprint consistent with the Stipulated Order to Comply entered into between CEMEX and Yolo County on June 2, 2017;
4. A change to the boundary between Phases 3 and 4 to reconfigure the alluvial separator and facilitate the use of Phase 3 as a settling pond after mining is complete in that phase;
5. The use of the east half of the existing Phase 2 area as an extension of the existing processing plant site for purposes of product stockpiling and construction materials recycling;
6. Updates to the reclamation acreages and end use objectives for agriculture, habitat, and lakes, with incorporation of modern reclamation performance standards; and
7. A 20-year extension of the mining permit to 2047 to allow for the extraction of aggregate reserves within the proposed mining footprint.

Except as outlined above, CEMEX proposes no change to any fundamental element of the existing operation (e.g., mining methods, maximum depth of mining, processing operations, use of settling ponds to contain and settle aggregate wash fines, water use, truck routes, or hours of operation).

2.0 SURFACE MINING AND RECLAMATION ACT REQUIREMENTS

2.1 Description of Mining Operations

2.1.1 Name and Address of Operator and Agent [PRC §2772(c)(1)]

Operator:

CEMEX Construction Materials Pacific, LLC.
2365 Iron Point Road
Folsom, CA 95630

Contact: Steve Grace
Telephone: 831.970.9559
Email: roberts.grace@cemex.com

2.1.2 Quantity and Type of Mineral to be Mined [PRC §2772(c)(2)]

The Mine will continue to produce an anticipated 30 million tons of sand and gravel (mined weight) and 26 million tons of sand and gravel (sold weight), assuming a 13% wash loss at the aggregate processing plant (that will be directed to settling ponds).[1]

2.1.3 Initiation and Termination Dates [PRC §2772(c)(3)]

The Mine is active and has been continuously mined since 1971. Operations subject to this Plan will begin as soon as all necessary County approvals are obtained. For the purposes of satisfying SMARA informational requirements, the estimated initiation date of the surface mining operation under this Plan is June 1, 2023, and the estimated termination date of the surface mining operation under this Plan is August 11, 2047. This estimated termination date represents a 20 year extension of the end date for mining approved in the 1996 County-issued mining permit. Final reclamation sign-off may not occur for an additional period of three to five years (e.g., to allow reclamation performance standards to be met), extending the estimated timeframe for final reclamation sign-off to August 11, 2052.

2.1.4 Maximum Anticipated Depth of Mining [PRC §2772(c)(4)]

The maximum anticipated depth of mining is approximately 70 feet bgs, with a finish mine floor corresponding to elevation 64 feet msl at Phase 6 (see Sheet M-07). Actual depths may vary depending on soil/geologic conditions. If economic or operating constraints are encountered

[1] Mined weight = sold weight / (100% - 13% Wash loss)

during the mining operation, then the maximum depth of mining may not be achieved. Anticipated final reclamation grades are shown on Sheets R-04 through R-15.

2.1.5 Reclamation Plan Map Requirements [PRC §2772(c)(5)]

Size, Legal Description, and Owners of Surface and Mineral Interests [PRC §2772(c)(5)(A)]

The site legal description is included on Sheet R-01, Title Sheet. See also Sheet M-03, Property Information, which reflects the specific property boundaries of the Record of Survey, filed January 12, 2018, in 2018 Book of Maps at pages 2-4.

Property Lines, Setbacks, and Reclamation Plan Boundary [PRC §2772(c)(5)(B)]

See Sheets R-01 through R-15.

Existing and Final Topography [PRC §2772(c)(5)(C)]

See Sheets R-04 through R-15.

Geologic Description [PRC §2772(c)(5)(D)]

See Figure 3, Site Geology Map.

Railroads, Utilities, Access, and Roads [PRC §2772(c)(5)(E)]

The Mine will be accessed from the existing driveway entrance on California Highway 16. Access points are shown on Sheets M-03, M-04, R-03 and R-04. High-voltage transmission lines operated by Pacific Gas and Electric ("PG&E") run across a portion of the Mine site and will be avoided with appropriate setbacks, "Consent to Use" or "Joint Use Agreements." A windmill is also located on the Mine site and will continue to be avoided with a minimum 200-foot setback. Known utilities and easements are shown on Sheet M-03.

The most prominent drainage feature in the vicinity of the site is Cache Creek, which flows generally in a west to east direction at the north end of the site (see Figure 2). At its closest point, Cache Creek is approximately 200 feet from the Mine boundary. There are no railroads on or in proximity to the Mine.

Preparation by Licensed Professionals as Required [PRC §2772(c)(5)(F)]

As required by Yolo County, the mining and reclamation plan sheets have been prepared and stamped by a California-registered engineer.

2.1.6 Mining Description and Time Schedule [PRC §2772(c)(6)]

The following description of mining operations is provided primarily for contextual purposes to facilitate understanding of this Plan. Mining methods and practices will conform to the conditions of the long-term off-channel mining permit issued by Yolo County.

Mining Methods

The Mine is planned to be further developed and ultimately reclaimed in six phases, the first two of which have already been mined but not fully reclaimed. Except where mining has already occurred, mining operations will be initiated by the removal of vegetation, topsoil/growth media, and overburden materials that lie above marketable sand and gravel deposits. The overlying materials will be removed using scrapers aided by a motor grader and bulldozer, or excavator and off-road haul trucks as needed. After overlying materials are removed, marketable sand and gravel will be excavated using conventional mining equipment such as scrapers, excavators, and bulldozers (for dry mining) and electric dredge (for wet mining). Following excavation, the sand and gravel will be transported primarily by electric conveyor to the existing aggregate processing plant for washing, crushing, sorting and sale. Figure 2 shows the existing portions of the conveyor alignment that will be extended in the future to reach mine Phases 4, 5 and 6.

Alluvial Separators

The Mine design includes 1) a "constructed" alluvial separator between Phases 3 and 4 (see Sheet M-02 for typical detail and Sheets M-04 and M-05 for location); and 2) the development of a "natural" alluvial separator between Phases 4 and 5 (see Sheets M-06 and M-07). The "constructed" alluvial separator will be comprised of gravel and/or clay and the "natural" alluvial separator will consist undisturbed, natural ground between existing and future mining pits. The purpose of the constructed alluvial separator is to re-purpose Phase 3 as a settling pond (to accept and settle process wash fines). The purpose of the natural alluvial separator between proposed Phases 4 and 5 is to facilitate backfilling of Phase 4 for a return to agriculture while maintaining a stable separation for the future open water lake in future Phase 5.

Anticipated Sequence of Mining and Reclamation

Mining will continue to progress in a manner that will allow for concurrent reclamation to be initiated at the earliest possible time on those portions of the mined lands that will not be subject to further surface mining disturbances. No further mining is planned to occur in Phases 1 and 2. Phase 1 is mostly reclaimed with approximately 110 acres ready for agricultural crop plantings in November 2022. The remainder of Phase 1 is used as a silt pond and is in the process of reclamation. of the eastern half of Phase 2 has been repurposed as an extension of the aggregate processing plant site for purposes of product stockpiling and will be reclaimed at the end of Mine life along with the remainder of the plant site. The western half of Phase 2 will be reclaimed within five years of approval of this Plan.

The Operator currently anticipates that mining will continue to progress in the following general sequence: Phase 3 and Phase 4 (to be mined concurrently), Phase 5, and Phase 6. Once fully mined, Phase 3 will be repurposed as a silt pond (with the constructed alluvial separator separating it from Phase 4) to accept wash fines from the aggregate production process, ultimately facilitating a reclamation backfill to agriculture. After Phase 6 is mined, the Operator will perform limited additional mining in the northern portion of Phase 5 as the conveyor

assembly is removed to develop a habitat island as part of reclamation (see Sheets M-07 and R-06 for detail).

Reclamation will be initiated at the earliest possible time on those portions of the site that will not be subject to further disturbance by mining. An estimated time schedule for mining and reclamation is provided in Table 1, below.

TABLE 1

ANTICIPATED PROGRESSION OF MINING AND RECLAMATION[1,2]

Area	Mining (Start)	Mining (End)	Reclamation (Start)	Reclamation (End)[3]
1. Phase 1	--	Completed	In process	2025
2a. Phase 2 – West[4]	--	Completed	2025	2026
2b. Phase 2 – East[5]	--	Completed	2047	2048
3. Phase 3[6]	In process	2023	2024	2048
4. Phase 4	In process	2024	2022	2039
5. Phase 5[7]	2022	2033 / 2047	2033 / 2047	2034 / 2048
6. Phase 6	2033	2047	2047	2048
7. Phase 7 – Eliminated[8]	--	--	--	--
8. Processing Plant Site	--	--	2047	2048
9. Conveyor Alignment	--	--	2047	2048

Notes:

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1. Anticipated mining schedule assumes annual production of approximately 1,000,000 tons per year (sold weight). Therefore, it is possible that reclamation would start/end sooner than estimated above based on actual annual rates of production.
2. Anticipated progression is approximate only. Actual timelines will vary depending on market and geologic conditions.
3. Reclamation monitoring may continue for three to five years past the anticipated reclamation end date to ensure that reclamation performance standards are met.
4. Phase 2 (west half) will be reclaimed within five years of Plan approval.
5. Phase 2 (east half) will be used for stockpiling and construction materials recycling until 2047 when all mining is complete.
6. Phase 3 will begin to be used as a silt pond in approximately 2024, which will begin the process of reclamation back to agriculture by slowly backfilling the pond. The Operator may return to Phase 3 to perform final clean-up mining of the pit floor with the dredge prior to deposition of silts.
7. After Phase 6 is mined, the Operator will perform limited additional mining in the northern portion of Phase 5 as the conveyor assembly is removed to develop a habitat island as part of reclamation. This work is anticipated to occur in 2047.
8. Phase 7 has been eliminated from the project at the request of the County.

2.1.7 Public Health and Safety (Exposure) [CCR §3502(b)(2)]

Implementation of this Plan is not expected to jeopardize public health and safety. The Mine is already active and located on private property. No substantial change from existing operations (mining or reclamation activity) is anticipated through adoption of this Plan. The public is neither presently exposed to the site, nor will be during mining or reclamation activity. The potential health and safety exposure of the mine was fully analyzed in the 1996 Environmental Impact Report ("EIR") for the Solano Long-Term Off-Channel Mining Permit Application ("1996 EIR")

adopted as part of the existing entitlements (pursuant to CEQA) with appropriate mitigations requiring compliance with the County OCSMO and SMRO ordinances.

All visitors to the site are required to sign-in and undergo site-specific safety training as appropriate. Safety measures such as fencing, signs, and setbacks are implemented to ensure public safety. For example, existing fencing is in place around all areas of open excavation, which goes above and beyond the County's SMRO requirement for fencing around open water areas. While fencing may be used for public safety, it is not intended to prevent access for wildlife foraging (avian species).

No portals, shafts, tunnels or other openings to underground workings are mapped or proposed.

2.2 End Land Use

2.2.1 Proposed or Potential End Uses [PRC §2772(c)(7)]

The planned end uses for the Mine are agriculture, permanent lakes and wildlife habitat. The permanent lakes are ultimately planned to be dedicated to the County. The Owners' acknowledgment of the potential end uses is evidenced by execution of its Statement of Reclamation Responsibility (see Section 2.12.1, below).

Table 2 below summarizes reclamation end uses by mining phase or disturbance area.

2.2.2 Reclamation Measures Adequate for the End Use [PRC §2772(c)(8)]

Reclamation will be conducted in the following manner to support the potential end uses:

1. During reclamation, redistribute stockpiled topsoil/growth media in preparation for revegetation.
    - *Note: Prior to overburden removal and mining, approximately 12-24 inches of salvageable topsoil will be excavated in a separate lift and either used immediately for reclamation or stockpiled/segregated (with signage as needed) for use in future reclamation (see Sheets M-06 and M-07 for anticipated stockpile locations).*

TABLE 2
RECLAMATION END USES AND ACRES

Phase / Area	Agriculture (± acres)	Habitat (± acres)	Lakes (± acres)	Slopes & Roads (± acres)	Total (± acres)
1	124.5	5.8		0.4	130.7
2	63.7				63.7
3	91.7	5.4		2.9	100.0
4	111.3	8.1			119.4
5		27.5 (shoreline) 9.4 (other)	102.9	5.9	145.7
6		33.2 (shoreline) 7.4 (other)	101.1	4.1	145.8
Plant Site	27.4	6.2		1.3	34.9
Creek Setback		68.7			68.7
Other Buffer				4.6	4.6
I-505 Buffer		2.3			2.3
Total	**418.6**	**167.7**	**210.4**	**19.2**	**815.8**

2. Rip, disc and/or scarify revegetation areas as needed to establish a suitable root zone in preparation for plantings.

3. For areas reclaimed to an end use of wildlife habitat, revegetate disturbed surfaces with seed mixes and plantings as set forth in this Plan.

4. For areas reclaimed to an end use of agriculture, backfill and/or level fields as appropriate, conduct soil testing (if needed to fulfill reclamation success criteria), grade for positive drainage, and disc/prep for crop plantings.

5. Remove facilities, structures, stockpiles and equipment associated with mining. The following may be left in place to facilitate the potential end uses: water supply wells, fencing, perimeter berms, access roads, and conveyor network maintenance roads.

6. Unless left in place to facilitate the potential end uses, reclaim all temporary interior haul roads, and conveyor corridors similar to other reclamation areas. Specific reclamation practices would include removing road base materials, ripping, discing, and reseeding as appropriate.

7. Implement best management practices as needed to minimize erosion and sedimentation pursuant to applicable standards.

8. Collect and dispose of any incidental refuse or garbage in accordance with applicable standards.

2.2.3 Impact of Reclamation on Future Mining in the Area [PRC §2772(c)(9)]

This Plan will not preclude future mining in the area in the event marketable resources are found.

2.3 Environmental Setting [CCR §3502(b)(1)]

2.3.1 Assessor Parcels, Ownership, Zoning and General Plan Designations

Mine Assessor Parcel Numbers ("APNs"), ownership, Zoning and General Plan land use designations are shown on Table 3, below.

2.3.2 Access and Utilities

The Mine will be accessed from the existing driveway entrance on California Highway 16. Access points are shown on Sheets M-04, M-08, R-03 and R-07. On-site utilities are limited to power. High-voltage transmission lines operated by PG&E run across the Mine site and will continue to be avoided with appropriate setbacks from Phases 5 and 6. "Consent to Use" or "Joint Use Agreements" may be executed with PG&E for work within easement areas. A windmill is also located on the Mine site in Phase 3 and will continue to be avoided with a minimum 200-foot setback (see Sheet M-05). Utilities and easements are shown on Sheet M-03.

TABLE 3
ASSESSOR PARCELS, OWNERSHIP, ZONING AND GENERAL PLAN DESIGNATIONS

APN	Assessor Acres[1]	ROS Acres[2]	Ownership[3]	Zoning[4]	General Plan[5]
025-450-001	291.1	280.0	United Metro Materials Inc	A-N (SG)	AG, OS
049-060-004	6.3	6.3	Solano Concrete Co Inc	A-N (SG)	AG, OS
049-060-007	142.8	142.4	Solano Concrete Co Inc	A-N (SG)	AG
049-070-004	112.7	110.7	United Metro Materials Inc	A-N (SG)	AG, OS
049-070-005	98.5	112.8	United Metro Materials Inc	A-N (SG)	AG, OS
049-070-006	200.2	200.1	United Metro Materials Inc	A-N (SG)	AG, OS
049-070-009	444.0	461.6	United Metro Materials Inc	A-N (SG)	AG, OS
049-070-010	17.1	17.1	Solano Concrete Co Inc	A-N (SG)	AG, OS
049-070-011	26.2	26.5	Solano Concrete Co Inc	A-N (SG)	AG, OS
049-070-019	53.9	48.0	Solano Concrete Co Inc	A-N (SG)	AG, OS
049-070-020	212.2	218.5	United Metro Materials Inc	A-N (SG)	AG
049-070-021	276.4	278.3	Solano Concrete Co Inc	A-N (SG)	AG
Total:	**1,881.4**	**1902.3**			

Notes:

1. Source: Yolo County Assessor, accessed November 28, 2017.
2. Source: Record of Survey, filed January 12, 2018, in 2018 Book of Maps at pages 2-4.
3. United Metro Materials, Inc. and Solano Concrete Co Inc. are fully-owned subsidiaries of CEMEX.
4. A-N = Agricultural Intensive. The Sand and Gravel (SG) overlay zone applies to State designated mineral resource zones (MRZ-2) containing critical geological deposits needed for economic use in the future, as well as applying to existing mining operations. The portions of the parcels that are subject to mining already have the SG overlay.

5. Source: 2030 Countywide General Plan, with verification thru Yolo County GIS Public Viewer. AG = Agriculture. OS = Open Space. The Open Space land use designation applies to the portions of the parcels associated with Cache Creek.

2.3.3 Geology

The geology of the site is shown on Figure 3. The Mine is located in the northern portion of the Great Valley Geomorphic Province of California. The Mine is located on an alluvial terrace surface south of Cache Creek and is underlain by Quaternary alluvial deposits of the creek. The northern portion of the site is mapped as part of the active stream channel, while the central area is underlain by Holocene alluvial deposits. The southern portion of the site is underlain by older alluvium units. Mineral resources consist primarily of sand and gravel.

The site is not located in any currently established official geologic hazard zones (e.g., liquefaction, active faulting, landslides) established by the California Geologic Survey ("CGS") or local agency specific plan element.

2.3.4 Soils

The Natural Resources Conservation Service ("NRCS") has mapped eight soil units on the Mine site, as shown on Table 4, below (see also Figure 4, Soils Map).

2.3.5 Seismicity

The site is not located within a currently established Alquist-Priolo Earthquake Fault Zone. There are no active faults mapped within the Mine limits and the site is not within an Earthquake Fault Zone as mapped by the California Geological Survey. The Great Valley Fault System and a segment of the Dunnigan Hills Fault, located approximately 6 miles to the west and northwest, respectively, are the closest known active faults to the site (Geocon, 2018).

2.3.6 Biological Resources and Communities

CEMEX retained Zentner Planning & Ecology ("Zentner") to assess the potential for sensitive biological communities, special-status plant and wildlife species, and sensitive biological resources at the site (see Appendix A, Biological Resources Update). The key findings of Zentner's updated assessment are summarized below.

TABLE 4
NRCS SOIL SUMMARY

Map Unit Symbol	Map Unit Name	Typical Profile
Within surface mining disturbance boundary:		
BrA*	Brentwood silty clay loam, 0 to 2 percent slopes	H1 - 0 to 10 inches: silty clay loam H2 - 10 to 35 inches: silty clay loam H3 - 35 to 60 inches: silty clay loam
Ya*	Yolo silt loam, 0 to 2 percent slopes	Ap1 - 0 to 2 inches: silt loam Ap2 - 2 to 8 inches: silt loam A1 - 8 to 19 inches: silt loam A2 - 19 to 26 inches: silt loam C1 - 26 to 33 inches: silt loam C2 - 33 to 41 inches: silt loam Ab - 41 to 58 inches: silty clay loam C'3 - 58 to 65 inches: silt loam
So**	Sycamore silt loam, 0 to 1 percent slopes	H1 - 0 to 14 inches: silt loam H2 - 14 to 60 inches: silt loam
Rh	Riverwash, 0 to 2 percent slopes	H1 - 0 to 6 inches: gravelly sand H2 - 6 to 60 inches: stratified gravelly coarse sand to sandy loam
Outside of surface mining disturbance boundary:		
Ca*	Capay silty clay, 0 percent slopes	Ap - 0 to 11 inches: silty clay A - 11 to 18 inches: silty clay Bss1 - 18 to 36 inches: silty clay Bkss - 36 to 49 inches: silty clay B'ss2 - 49 to 64 inches: silty clay
Lm	Loamy alluvial land, 0 to 2 percent slopes	H1 - 0 to 10 inches: gravelly sandy loam H2 - 10 to 30 inches: stratified sand to gravelly loam H3 - 30 to 60 inches: stratified gravelly sand to gravelly loam
Mf*	Marvin silty clay loam, 0 to 1 percent slopes	H1 - 0 to 12 inches: silty clay loam H2 - 12 to 41 inches: silty clay H3 - 41 to 60 inches: silty clay loam
Sh	San Ysidro loam, 0 to 5 percent slopes	Ap - 0 to 8 inches: loam A - 8 to 15 inches: clay loam Bt1 - 15 to 26 inches: clay Bt2 - 26 to 34 inches: clay Bt3 - 34 to 54 inches: silty clay Ck - 54 to 80 inches: silty clay loam

Notes:

* Soil type meets the criteria for "prime farmland" as outlined in the U.S. Department of Agriculture's Land Inventory and Monitoring Project for the Yolo County soil survey.

** Soil types meets the criteria for "prime farmland" if drained.

Biological Communities:

Zentner identified the following biological communities on-site:

1. Perennial Marsh. Perennial marsh is restricted to the periphery of the deeper pools found within Cache Creek. These pools usually are formed within eroded cuts near the toe of the creek banks or within beaver dams that are common throughout the channel. These marshes support deep-rooted perennials such as bulrush (*Schoenoplectus acutus*), cattail (*Typha sp.*) and rushes (J*uncus sp.*).

2. Riparian. The riparian vegetation on site is primarily located near the toe of the creek banks along Cache Creek. It is also found in old carved out creek meanders on both the north and south banks, with some of the old meanders relatively high in elevation compared to the existing channel bed. A few of these old meanders are located within the project site within a distance of approximately 150 feet of the channel bed. These riparian areas are dominated by various species of willows (*Salix sp.*), Fremont cottonwood (*Populus fremontii*) and mulefat (*Baccharis salicifolia*).

3. Oak Savanna. The oak savanna runs along a relatively narrow band near the top of the southern bank of Cache Creek. This habitat, which is dominated by valley oak (*Quercus lobata*) with an understory of annual grassland, likely covered much of the region in proximity to Cache Creek prior to human disturbances.

4. Annual Grassland. Perennial grassland habitat, along with oak savanna, likely once co-dominated the entire site from the banks of Cache Creek to the southern edge of the property along Highway 16. The existing grassland is dominated by non-native, annual grasses such as wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut (*Bromus diandrus*), and rye (*Festuca perennis*). It is found along the upper banks of Cache Creek and on the terrace between the creek and the active mining areas and agricultural areas. A more ruderal form of the annual grassland is found along the margins of these mined areas and the agricultural parcels.

5. Ruderal. A portion the annual grassland habitat is dominated by ruderal (weedy) vegetation. These areas are generally located near the CEMEX operating plant or in disturbed areas adjacent to mining or agricultural fields. Habitat in these areas are dominated by thistles (milk thistle, *Silybum marianum*; bull thistle, *Cirsium vulgare*), starthistle (*Centaurea solstitialis*) and other weedy species.

6. Agriculture. The majority of the site consists of agricultural land that is currently being mined or will be mined in the future. Recently the site was in wheat and oat hay crop production. In prior years crops have included corn, sunflowers, and tomatoes.

Special-Status Species:

Zentner identified four special-status species that are either known to occur or that have the appropriate habitat to occur on site:

1. Bank swallow (*Riparia riparia*), State Threatened. Present nesting.
2. Swainson's hawk (*Buteo swainsoni*), State Threatened. Observed foraging or flying over the site.
3. Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*), Federally Threatened. Present along Cache Creek.
4. Western red bat (*Lasiurus blossevillii*), Western Bat Working Group – High Priority, CDFW Species of Special Concern. Limited potential habitat occurs within the habitat depressions and along the banks of Cache Creek.

Pursuant to PRC §2772.1, the County will evaluate the potential for impacts to these species and outline appropriate mitigations as needed in the project CEQA document.

2.3.7 Hydrology

Surface Waters and Drainage

Cache Creek, which flows generally from west to east, is located to the north of the Mine boundary (see Figure 2). Mining activity will continue to be setback a minimum of 200 feet from the creek. No wetlands or other Waters of the U.S. have been mapped within the Mine boundary.

In 2016, CEMEX retained Cunningham Engineering ("Cunningham") to utilize the County's current Cache Creek hydraulic model to plot the 100-year water surface profile along the entire mining reach. Cunningham concluded that the 100-year water surface is effectively contained within the creek (see Appendix B, Hydraulic Analysis of the CEMEX Reach).

Groundwater

CEMEX retained Luhdorff & Scalmanini Consulting Engineers ("LSCE") to prepare a groundwater assessment in support of this Plan and a 20 year mining use permit extension (see Appendix C, Groundwater Assessment). LSCE's assessment provides detailed documentation of historic and current groundwater conditions at the site, which is summarized below.

The groundwater monitoring well network at the site presently consists of a total of 19 wells, including 15 dedicated observation wells and 4 production wells. Continuous groundwater monitoring has been taking place in on-site wells since 1990 and LSCE has been preparing annual monitoring reports with cumulative data evaluation since 2003, with the most recent one dated October 25, 2022 (LSCE 2022). Results of the ongoing monitoring efforts provide a comprehensive data set of groundwater conditions in the vicinity of the Mine including pre-mining conditions and conditions throughout mining and reclamation activities that have

occurred to date. The entirety of this record shows no evidence or indication that the mining and plant operations have caused any changes in groundwater levels or quality to date. (LSCE 2022).

In March 2017, the principal direction of groundwater flow was to the east, with groundwater elevations ranging from 126' msl to 108' msl (see Appendix C at Figure 7). During this time, groundwater levels were above Cache Creek's theoretical thalweg elevations indicating that the groundwater was acting as a source of recharge to the creek. The conditions are typical for times of higher groundwater levels (winter and early spring) in the vicinity of the CEMEX properties, and are consistent with the historical water level record. In September 2017, the principal direction of groundwater flow was to the east, with groundwater elevations ranging from 120' msl to 102' msl (see Appendix C at Figure 8). During this time, groundwater levels were near to or below Cache Creek's theoretical thalweg elevations indicating that the creek acted as a source of recharge to the local groundwater. These conditions are typical for times of low groundwater levels (late summer and fall) in the vicinity of the CEMEX Madison properties, and are consistent with the historical water level record.

CEMEX also retained LSCE to provide an estimate of average high and average low groundwater levels to inform the engineering designs for this Plan (see Appendix D, Estimation of Average High Groundwater Levels, and Appendix E, Estimation of Average Low Groundwater Levels). The average high and average low groundwater level estimates were obtained to ensure this Plan meets the following County code requirements:

1. County SMRO Section 10-5.516, which requires that reclaimed agricultural fields be backfilled to an elevation at least five feet above the average high groundwater level; and

2. County SMRO Section 10-5.530, which requires that final slopes less than five feet below the average low groundwater level shall not be steeper than 2H:1V.

The estimated average high and average low groundwater levels have been incorporated into project design, as appropriate.

2.4 Effect on Surrounding Land Uses [CCR §3502(b)(1)]

2.4.1 Surrounding Land Uses

The predominant land uses in the vicinity of the Project include aggregate mining and processing, agriculture and open space associated with Cache Creek (see Figure 2). To the north, the site is bound by Cache Creek and agricultural lands that lie beyond it. To the east, the site is bound by agriculture as well as a rural residential / commercial land use. To the south, the site is bound by California Highway 16 and agriculture, with a few rural residences. To the west, the site is bound by Interstate 505.

2.4.2 Effect that Reclaimed Site Conditions May Have on Surrounding Land Uses

Reclamation to the planned end uses of agriculture, permanent lakes and wildlife habitat are not anticipated to have any substantial effect on existing and future uses of surrounding lands. In fact, many of the surrounding lands currently exhibit similar land uses.

2.5 Slope Stability and Disposition of Fill Materials

2.5.1 Final Slopes; Slope Angles Flatter than Critical Gradient [CCR §3502(b)(3)]

CCR §3704(f). *Final cut slopes have minimum factor of safety for end use and conform with surrounding topography and/or approved end use.*

CEMEX retained Geocon Consultants ("Geocon") to perform a slope stability evaluation in support of this Plan (see Appendix F, Slope Stability Evaluation).

Geocon assessed the following final cut slope parameters of the Mine design for a maximum slope height of 70 feet:

Slope:	**Gradient (H:V):**
Finish cut slopes, from surface to 5 feet below average low groundwater levels	2:1
Finish cut slopes, >5 feet below average low groundwater levels	1:1

Geocon concluded that these recommended reclamation slope angles will be stable with adequate static (≥ 1.5) and seismic (≥ 1.1) factors of safety for the proposed end uses.

For the perimeter of permanent lakes to be developed under this Plan, slopes ranging from 2:1 to 10:1 above water will be developed to enhance the development of vegetation zones, the provision of wildlife habitat, and a diverse scalloped shoreline. These gentler slopes are shown on Sheet R-06, Phases 5 and 6. These slopes may either be excavated to this condition or backfilled to achieve this final condition, as further described in Section 2.5.2, below.

2.5.2 Fill Slopes and Compaction Standards

CCR §3502(b)(4). *Disposition of fill materials considered. Foundation fills for end use in conformance with good engineering practice.*

CCR §3704(a). *For urban use, fill compacted in accordance with UBC, local grading ordinance, or other methods approved by the lead agency.*

CCR §3704(b). *For resource conservation, compact to standard for that end use.*

CCR §3704(d). *Final reclamation fill slopes not exceed 2:1, except when allowed by site-specific engineering analysis, and can be revegetated.*

CCR §3704(e). *At closure, final landforms of fills conform with surrounding topography and/or approved end use.*

Phases 1, 2, 3, and 4 will receive backfill for reclamation to agriculture. Phases 5 and 6 will be reclaimed to permanent lakes and will generally not require backfill (unless performed at the direction of the project habitat restoration consultant to flatten perimeter lake slopes for future habitat value). Backfill with overburden and topsoil will be performed using conventional mobile equipment such as scrapers and bulldozers that will provide an appropriate level of compaction for the planned end uses. Reclaimed (backfilled) agricultural fields will have lowered elevations relative to original ground. However, as required by SMRO Section 10-5.516, the final distance between lowered surfaces reclaimed to agriculture and the average high groundwater will not be less than five feet (see Sheets R-04, R-05 and R-07). Final landforms of fills conform to County requirements and will be compatible with the end use. Final reclamation fill slopes will not be steeper than 2H:1V.

As previously described, the Mine design includes a "constructed" alluvial separator between Phases 3 and 4, which is comprised of gravel and clay with 4H:1V side slopes, to re-purpose Phase 3 as a settling pond (see Sheet M-05). Geocon specifically analyzed stability for the constructed alluvial separator and found that it would have adequate static and seismic factors of safety of 2.9 and 1.6, respectively (see Appendix F for detail). The design separator was completed in 2022.

No backfill for urban uses or resource conservation purposes is proposed.

2.6 Hydrology and Water Quality

2.6.1 Surface and Groundwater Quality Protected in Accordance with Porter-Cologne and Clean Water Acts [CCR §3710(a)]

CCR §3706(a). *Mining and reclamation to protect downstream beneficial uses.*

CCR §3706(b). *Water quality, recharge, and groundwater storage that is accessed by others shall not be diminished, except as allowed by plan.*

CCR §3503(b)(2). *Substantially prevent siltation of groundwater recharge areas.*

Surface and groundwater will continue to be protected from siltation and pollutants as required by the Federal Clean Water Act, the Porter-Cologne Water Quality Control Act, County ordinances, Regional Water Quality Control Board (RWQCB) and the State Water Resources Control Board.

The site is subject to storm water events but does not discharge surface water from mined areas. The mining areas effectively function as self-contained basins. If required in the future, the Operator will comply with National Pollutant Discharge Elimination System ("NPDES") Industrial Storm Water General Permit requirements, including implementation of a Storm Water Pollution

Prevention Plan ("SWPPP") with Best Management Practices ("BMPs") to control erosion, sedimentation, and pollution. In addition, the Operator will continue to comply with its existing Waste Discharge Requirements Order No. R5-2003-0113 ("Order," issued by the RWQCB Central Valley Region), as may be amended from time to time, governing the discharge of process water and process wash fines to land.

As required, the Operator will implement a Spill Prevention, Control, and Countermeasure Plan ("SPCC Plan") and Hazardous Materials Business Plan pursuant to 40 CFR Part 112 and 19 CCR Section 2729, respectively.

Based on the results of LSCE's groundwater assessment (Appendix C), surface mining and reclamation activities are not expected to affect downstream beneficial uses of water, or the quality of water, recharge potential, or storage capacity of groundwater aquifers. LSCE concluded that the entirety of the site record shows no evidence or indication that the mining and plant operations have caused any changes in groundwater levels or quality to date, or that they would in the future.

2.6.2 Drainage, Sediment and Erosion Control [PRC §2773(a)]

CCR §3503(a)(3). *Erosion control facilities constructed and maintained where necessary.*

CCR §3503(b)(1). *Settling ponds used where they will provide significant benefit to water quality.*

CCR §3503(e). *Grading and revegetation to minimize erosion and convey surface runoff to natural drainage courses or interior basins. Spillway protection.*

CCR §3706(c). *Erosion and sedimentation controlled during all phases of construction, operation, reclamation, and closure of surface mining operation to minimize siltation of lakes and water courses per RWQCB/SWRCB.*

CCR §3706(d). *Surface runoff and drainage controlled to protect surrounding land and water resources. Erosion control methods designed for not less than 20 year/1 hour intensity storm event.*

CCR §3706(e). *Altered drainages shall not cause increased erosion or sedimentation.*

Drainage and Erosion Control

This Plan is designed to minimize erosion and retain direct precipitation and run-on in interior basins including the existing riparian depressions along the north side of the Mine. As required by CCR §3706(d), erosion control methods have been designed for the 20 year/1 hour intensity storm event (see Sheet M-02, at Note 11).

The Mine is located in the vicinity of Cache Creek (see Figure 2) and mining will continue to be set back a minimum of 200 feet from the creek. Drainage patterns for mining and reclaimed

conditions are represented by arrows on Sheets M-05 through M-08 and Sheets R-04 through R-07. Erosion control facilities, such as rip-rap run downs with velocity dissipation have been incorporated into drainage design (see Sheet M-02 for typical detail).

During mining operations, surface runoff that collects in the mine floor will be allowed to evaporate, infiltrate, or be used on-site (e.g., for dust control). Berms and ditches will be used to prevent off-site drainage (e.g., from adjacent agricultural fields) from entering open water excavations. Erosion control facilities will be monitored at least annually during routine engineering evaluations of the site, as required by the County.

Per Zentner's recommendation, upland areas above the existing open water pits (north side of Phases 3, 4, and 5, within the 200-foot creek buffer) have been designed to drain into the existing riparian depressions located between the open water pits and the creek (see Appendix G, Letter Recommendation for Drainage to Riparian Depressions). Zentner assessed these riparian depressions as part of its habitat restoration plan update (described later in this Plan) and advised that their high infiltration rates and small watersheds would not sustain long-term habitats without supplemental hydrology. Zentner noted that this may be why a number of trees died within the depressions during the recent extended drought. This drainage plan also serves to direct runoff from mined areas away from the open water pit excavations in Phases 3 and 4, consistent with the requirements of County code.

Natural drainage courses will not be covered, restricted, rerouted or otherwise impacted by surface mining activities.

If required, the Operator will comply with the NPDES General Permit requirements, which involves preparation and implementation of a SWPPP, including BMPs to control erosion, sedimentation, and pollution. During initial surface disturbance activities, customary BMPs, as well as the requirements of a SWPPP, if needed, will be implemented to ensure that water courses are protected from erosion, gullying, sedimentation and potential contamination. Slopes will be vegetated with appropriate native seed mixes once final reclamation grades are achieved.

Settling Ponds

Settling ponds (accepting and settling aggregate process wash fines, or silts) have been used at the site since the onset of aggregate processing activities in the 1970s. Portions of Phase 1, which have already been substantially reclaimed to agriculture, were once used as settling ponds. Currently, a small pond in the northeast corner of Phase 1 serves as the active settling pond that receives wash fines discharged from the aggregate processing plant (see Sheet M-05). The Operator will continue to use this pond as a settling pond until it reaches its capacity.

The Operator has constructed an alluvial separator (dike) at the east end of Phase 3 to re-purpose the area as the Mine's ultimate settling pond. The Phase 3 and alluvial separator configuration was specifically designed for sufficient capacity to accommodate the wash fines that are projected to be generated from the anticipated life of the Mine (i.e., aggregate wash fines silts

generated from the production of 30 million tons of mined sand and gravel). Discharge of wash fines will continue to be conducted pursuant to the WDR Order No. R5-2003-0113.

2.6.3 Contaminant Control and Mine Waste Disposal [PRC §2772(c)(8)(A)]

CCR §3503(a)(2). *Overburden stockpiles managed to minimize water and wind erosion.*

CCR §3503(d). *Disposal of mine waste and overburden shall be stable and not restrict natural drainage without suitable provisions for diversion.*

CCR §3712. *Mine waste and tailings, and mine waste disposal units governed by SWRCB/IWMB (Article 1, Subchapter 1, Chapter 7, Title 27, CCR).*

Mine waste will be limited to overburden (to be used on-site for reclamation) and general refuse (which will be disposed of in accordance with applicable standards). Fill slopes (if any), perimeter berms, and temporary stockpiles will be seeded and wetted as needed to minimize water and wind erosion, and will not restrict natural drainage courses. No material stockpiles will be left following reclamation. However, any berms installed for safety along roads may be left in place, where those roads remain to facilitate the planned end uses.

2.6.4 In-stream Activities [CCR §3710(b)]

PRC §2772(c)(8)(B). *Rehabilitation of streambanks/beds to minimize erosion.*

CCR §3502(b)(6). *Temporary stream and water diversions shown.*

CCR §3706(f)(1). *Stream diversions constructed in accordance with Fish and Game Code.*

CCR §3706(f)(2). *Stream diversions constructed in accordance with Federal Clean Water Act and Rivers and Harbors Act of 1899.*

CCR §3706(g). *All temporary stream diversions eventually removed.*

CCR §3710(c). *In-stream channel elevations and bank erosion evaluated annually using extraction quantities, cross-sections, aerial photos.*

CCR §3710(d). *In-stream mining not cause fish to be trapped in pools or off-channel pits, or restrict migratory or spawning activities.*

The Mine is located south of Cache Creek, and mining will continue to be set back a minimum of 200 feet from the creek. No in-stream mining or work in the active waterway is proposed. Temporary stream and water diversions are not required.

2.7 Protection of Fish and Wildlife Habitat [CCR §3503(c)]

CCR §3703(a). Sensitive species conserved or mitigated.

CCR §3703(b). Wildlife habitat at least as good as pre-project, if approved end use is habitat.

CCR §3703(c). Wetlands avoided or mitigated at 1:1 minimum.

CCR §3704(g). Piles or dumps not placed in wetlands without mitigation.

The Operator will avoid sensitive habitats and protected trees (as identified in Appendix A) until such time as it obtains the required approvals from appropriate regulatory agencies (e.g., Yolo County, U.S. Fish and Wildlife Service, Corps of Engineers, Central Valley Regional Water Quality Control Board and California Department of Fish and Wildlife). No wetlands have been mapped on-site and the undisturbed portions of future mining Phases 5 and 6 are in active agricultural production. If wetlands are identified in the future, then they will either be avoided or mitigated at 1:1 minimum ratios. For any sensitive avian species, active nests will be avoided during the nesting season or appropriate mitigation will be implemented as required by the responsible regulatory agency.

2.8 Resoiling [CCR §3503(f)]

CCR §3704(c). Mine waste stockpiled to facilitate phased reclamation and separate from growth media.

CCR §3503(a)(1). Removal of vegetation and overburden preceding mining kept to a minimum.

CCR §3711(a). All salvageable topsoil removed. Topsoil and vegetation removal not precede mining by more than one year.

CCR §3711(b). Topsoil resources mapped prior to stripping, location of stockpiles on map. Topsoil and growth media in separate stockpiles.

CCR §3711(c). Soil salvage and phases set forth in plan, minimize disturbance, designed to achieve reveg success.

CCR §3711(d). Topsoiling phase ASAP. Topsoil stockpiles not be disturbed until needed. Topsoil stockpiles clearly identified and planted with vegetation or otherwise protected.

CCR §3711(e). Topsoil redistributed in stable site and consistent thickness.

CCR §3707(b). Segregate and replace topsoil by horizon.

CCR §3705(e). Soil altered or other than native topsoil, requires soil analysis. Amend if necessary.

CEMEX retained Zentner to prepare an updated Habitat Restoration Plan, which includes recommendations on resoiling and substrate preparation that have been incorporated in this Plan (see Appendix H, Habitat Restoration Plan). Resoiling will occur in mined areas south of the 200-foot Creek buffer, primarily to return mined areas back to agriculture production. Some resoiling will also occur in the buffer areas around the reclaimed agricultural fields and the permanent lakes for habitat restoration.

Consistent with Zentner's recommendations, prior to revegetation the Operator will generally handle soils and prepare a revegetation substrate in the following manner:

1. Remove soils only as necessary to access new mining areas and use them for reclamation as soon as it can be accommodated by the mining schedule.

2. To the extent practicable, limit topsoil and vegetation removal to within one year of fill placement.

3. Where possible, place soils that have been removed for direct use in reclamation. Where salvaged topsoil cannot be used immediately for reclamation, stockpile it separately from other overburden and do not disturb until needed for reclamation.

4. Seed soil stockpiles with an appropriate native seed mixture as needed to prevent water and wind erosion and to discourage weed growth (see Table 10 in Section 2.9.1, below).

5. Prior to resoiling, rip, disc and/or scarify fill areas as needed to relieve compaction and remove rills, ruderal vegetation, or other surface irregularities.

    - For areas to be reclaimed to agriculture, rip all A-horizon and B-horizon soils to a depth of three (3) feet after every (2) foot layer of soil placement, per SMRO §10-5.531.

6. Redistribute topsoil in preparation for revegetation, with a target thickness of 12- to 24-inches of topsoil atop overburden and/or other native substrate materials in the mine floor.

    - The thickness of topsoil salvaged and redistributed on the site during reclamation will vary. The target thickness of 12- to 24-inches is only a guideline based on available site specific soil information.

    - For areas to be reclaimed to agriculture, where distinct soil horizons are present, the sequence of horizons will have the A atop the B, the B atop the C, and the C atop the graded surface.

7. Following resoiling, where soil has been compacted, till or scarify the ground surface to create a favorable seedbed.

Growth media for revegetation will consist of native topsoil and overburden. The average thickness of overburden and topsoil replaced on the site during reclamation will vary depending on the reclamation use of an area. Where salvaged topsoil and growth media cannot be used immediately, topsoil (A horizon) and other growth media (e.g., B and C horizon) will be stockpiled separately and will not be disturbed until needed for reclamation. Stockpiles will be properly identified with signage to help ensure topsoil and other growth media are not mistakenly blended. Soil stockpiles will have maximum heights of 40 feet and maximum side slopes of 2H:1V. These stockpiles will be seeded with an appropriate seed mixture as needed to prevent water and wind erosion and to discourage the growth of weeds.

Soil amendments, if required during revegetation efforts, will be applied according to manufacturer's specifications.

2.9 Revegetation [CCR §3705]

2.9.1 Vegetative Cover and Planting Procedures

CCR §3503(g). *Revegetation and plant survival (use available research).*

CCR §3705(a). *Vegetative cover, suitable to end use, self-sustaining. Baseline studies documenting cover, density and species richness.*

CCR §3705(c). *Decompaction of site.*

CCR §3705(g). *Use native plant species, unless exotic species meet end use.*

CCR §3705(h). *Plant during correct season.*

CCR §3705(i). *Use soil stabilizing practices and irrigation, when necessary to establish vegetation.*

CCR §3707(d). *Fertilizers and amendments not contaminate water.*

Revegetation Goals and Objectives

The Mine site will be reclaimed to agriculture, permanent lakes and wildlife habitat end uses. In support of these end use objectives, Zentner prepared an updated Habitat Restoration Plan, which includes detailed recommendations on restoration and revegetation that have been incorporated in this Plan (see Appendix H). Restored wildlife habitats will feature lakes with habitat peninsulas and islands, riparian woodland, perennial marsh, oak savannah, and native grasslands. Supplemental tree-screening is also planned along Interstate-505. Zentner's plan includes the following principles to create quality, self-sustaining habitats that provide native plant diversity for native wildlife:

1. Provide for a diversity of native habitat types and vegetative communities that have the potential to support a variety of native wildlife including special status species.

2. Provide native grassland buffers around reclaimed agricultural parcels as well as a wide, continuous native buffer between Cache Creek and reclaimed habitats.

3. Provide a continuous corridor between the lakes and Cache Creek.

4. Provide for a structurally diverse shoreline around the lakes with variable slopes and communities.

5. Provide diverse riparian habitats around the lakes and within the preserved depressions to provide important roosting and nesting habitats.

6. Provide islands in the Phase 5 and Phase 6 lakes with native riparian, oak savannah and grassland habitats to provide refugia and nesting habitat for native waterfowl and other wildlife.

Site Preparation for Revegetation

As disturbed areas become available for reclamation, habitat restoration areas will generally be prepared for revegetation as follows (see Appendix H at Section III for detail):

1. *Preconstruction Activities.* The restoration contractor will establish and stake the limits of planting areas. Where necessary, preconstruction surveys will be conducted and orange construction fencing or similar visible barrier will be installed to delimit sensitive areas adjacent to construction areas.
2. *Site Preparation.* Non-native vegetation, trash, debris, and weeds will be cleared. Prior to habitat restoration in the riparian depressions, grading within the adjacent oak savannah and upland mining areas will be completed to enlarge the watersheds for the riparian depressions as much as practicable (see also Appendix G). Unless already completed as a component of mining, the shoreline of the Phase 5 and Phase 6 lakes will be scalloped to provide a variety of slopes, peninsulas, and shallow water habitats.
3. *Resoiling*. As described in Section 2.8 above, each area to be re-vegetated will undergo resoiling as necessary or applicable to the end use with substrate scarification to promote revegetation efforts.

4. *Application of Herbicides*. Application of herbicides may be used ahead of planting to minimize potential for weed growth, as directed by the restoration contractor.

General Revegetation Practices

Revegetation will generally proceed in the following manner:

1. *Seeding and Planting*. Following site and substrate preparation for each area to be reclaimed, seeding and planting will occur as summarized below and detailed in Appendix H. Specific planting techniques are set forth in Appendix H at Chapter V.

2. *Timing*. To the extent practicable, seeding and planting will take place between October 1st and the end of February in order to take advantage of early season rainfall.

3. *Supplemental Irrigation*. Native trees and shrubs to be planted (e.g., in the riparian, oak savannah and native grassland habitats) will be irrigated through a simple, temporary drip system. Drip irrigation will be supplied for the planted trees and shrubs for up to two years from their initial planting with a gradual tapering in the third year and no irrigation in the fourth and fifth years. The species chosen for inclusion in the seed mixes (described below) are intended to be self-sustaining without dependence on long-term irrigation or ongoing applications of soil amendments or fertilizers.

Restoration Plantings

The following restoration planting details are sourced from Appendix H, Section V, Restoration Planting.

Riparian Woodland

Riparian woodland will be planted around the perimeter of the lakes and peninsulas in Phases 5 and 6, around the islands, and within the riparian depressions that are located within the geographic limits of the 200-foot Cache Creek setback. Within the lake and island areas, riparian woodland will be planted on the slopes buffering the lake starting at or just inside of average high water (AHW). This riparian habitat will slowly transition to oak savannah and native grassland. The result will be a complete system of grasslands and woodlands that will provide native diversity and cover for wildlife foraging and movement.

The riparian depressions will also be planted with riparian woodland. The surrounding slopes within the oak savannah and upland mining areas between Phases 3 and 4 and the riparian depressions will be graded such that they drain into these areas and help support the riparian hydrology of these depressional habitats. Invasive vegetation including but not limited to tamarisk, giant reed grass and several species of thistles will be removed and/or treated with an herbicide prior to revegetation work as appropriate for each species. For a complete list of the priority invasive plants that are subject to weed control please refer to Appendix H, Section IX.

Table 5 provides the planting pallet for restoration to Riparian Woodland. See Appendix H at Figure 3 for an illustrative typical cross-section.

TABLE 5
RIPARIAN WOODLAND PLANT LIST

Common Name	Scientific Name	Size	lbs/Acre
TREES			
red Willow	*Salix laevigata*	tree pot	32
arroyo willow	*Salix lasiolepis*	tree pot	25
black willow	*Salix gooddingii*	tree pot	15
Fremont cottonwood	*Populus fremontii*	tree pot	27
N. California walnut	*Juglans hindsii*	tree pot	10
boxelder	*Acer negundo*	tree pot	8
SHRUBS			
buttonbush	*Cephalanthus occidentalis*	1 gal	35
mugwort	*Artemesia douglasiana*	1 gal	40
mulefat	*Baccharis salicifolia*	1 gal	35
Calif. rose	*Rosa californica*	1 gal	23
Calif. blackberry	*Rubis ursinus*	1 gal	10
wild grape	*Vitis californica*	1 gal	10
		TOTAL	**270**
GRASSES			
creeping wildrye	*Elymus triticoides*	Plug	800

Perennial Marsh

Native perennial marsh vegetation will be planted around the Phase 5 and 6 lakes. This habitat most naturally occurs between average high water (AHW) and average low water (ALW), which is the zone where planting will take place. Vegetation will consist of relatively deep-rooted perennials that are adapted to perennially wet conditions. This vegetation will transition naturally to riparian woodland.

Table 6 provides the planting pallet for restoration to Perennial Marsh. See Appendix H at Figure 3 for an illustrative typical cross-section.

TABLE 6
PERENNIAL MARSH PLANT LIST

Common Name	Scientific Name	Size	lbs/Acre
bulrush	*Schoenoplectus acutus*	tree band	15
bulrush	*Schoenoplectus americanus*	tree band	15
cattail	*Typha domingensis*	tree band	20
baltic rush	*Juncus balticus*	rose-pot	100
common rush	*Juncus effuses*	tree band	15
dense sedge	*Carex densa*	rose-pot	100
horsetail	*Equisetum hyemale*	1 gal	10
		TOTAL	**275**

Oak Savannah and Native Grassland

The Oak Savannah habitat will be restored within the 200-foot buffer between Cache Creek and the mined areas. This habitat will contain relatively sparse trees with denser shrubs and a native grassland understory. This habitat better approximates the vegetation that existed in this zone prior to habitat conversion associated with human disturbances. As well, this vegetation is better adapted to the soils in this zone. The soils in this area are generally well-drained but contain pockets of more and less well drained soils. The planting pallet below allows for planting appropriate vegetation based upon soil micro-habitats as well as native grassland that is adapted to all of these soils. This vegetation will also be planted in the upper banks around the Phase 5 and 6 lakes above the riparian woodland vegetation and just up to the top of bank. Oak Savannah and native grassland understory vegetation will also be planted within the interior portion of the islands, in an elevation just above the riparian woodland. In both instances, the riparian woodland vegetation will transition to the oak savannah and native grassland vegetation.

Table 7 provides the tree and shrub planting pallet for oak savannah. The grassland seed mix component is detailed further below. See Appendix H at Figure 3 for an illustrative typical cross-section, Figure 6 for the peninsula planting plan, and Figure 7 for the island planting plan.

TABLE 7
OAK SAVANNAH PLANT LIST

Common Name	Scientific Name	Size	Qty/Acre
TREES			
Valley oak	*Quercus lobata*	tree pot	5
buckeye	*Aescuslus californica*	tree pot	7
interior live oak	*Quercus wizlensii*	tree pot	2
SHRUBS			
coyote bush	*Baccharis pilularis*	1 gal	39
yerba santa	*Eriodictyon californicum*	1 gal	28
coffeeberry	*Frangula californica*	1 gal	11
hollyleaf redberry	*Rhamnus ilicifolia*	1 gal	8
		TOTAL	**100**
GRASSES			
*See Native Grassland Plant List **(Table 8)** below*			

Native Grassland Buffer

The native grassland buffer habitat restoration will be located in areas that abut restored habitats including the lakes and the oak savannah. This habitat is meant to provide both a buffer from agricultural land uses and as a habitat transition to the restored habitats. As such, this habitat will be dominated by grasses and forbs. The restoration will occur by drill-seed in areas 3:1 or flatter and broadcast seeding in other instances. Rose-pots will generally be planted in clusters of between five to seven plants.

Table 8 provides the plant and seed mix for the native grassland lake buffer. See Appendix H at Figure 3 for an illustrative typical cross-section.

For these habitats, grass and grass-like plug plantings will be placed on one-foot centers. Trees and shrubs will be placed in clusters of approximately 3-5 plants except within the oak savannah, where trees will be relatively widely spread over the habitat.

Interstate 505 Tree Screen

Fremont cottonwoods will be planted to fill in the gaps of the existing cottonwoods that make up the Interstate 505 tree screen. A total of 40 trees will be planted to fill in these areas. In addition, a small portion of the screen closest to Cache Creek will be planted with California walnut, as these have been successful in this portion of the project area, and they will integrate into those that already exist.

Table 9 provides the planting pallet for the Interstate 505 tree screen.

TABLE 8
NATIVE GRASSLAND BUFFER PLANT LIST

Common Name	Scientific Name	Size	lbs/Acre
creeping wild rye	*Elymus triticoides*	seed	9
slender wheatgrass	*Elymus trachycaulus*	seed	7
purple needlegrass	*Stipa pulchra*	seed	6
blue wildrye	*Elymus glaucus*	seed	8
six-weeks fescue	*Festuca microstachys*	seed	2.5
meadow barley	*Hordeum brachyantherum*	seed	4
yarrow	*Achillea millefolium*	seed	2.5
California poppy	*Eschscholzia californica*	seed	3
sky lupine	*Lupinus nanus*	seed	3.5
gumplant	*Grindelia camporum*	seed	3
		TOTAL	**48.5**
milkweed	*Asclepias fascicularis*	rose pot	45
mugwort	*Artemesia douglasiana*	rose pot	15
		TOTAL	**60**

Note: Composition of seed mix (and appropriate modifications) to be determined based on availability from suppliers, test plot results (if applicable) and species determined most suitable at the time planting occurs.

TABLE 9
INTERSTATE 505 SCREENING PLANT LIST

Common Name	Scientific Name	Size	Number
TREES			
Fremont cottonwood	*Populus fremontii*	tree pot	40
California walnut	*Juglans hindsii*	tree pot	15

Soil Stabilizing Practices and Temporary Erosion Control

Should any supplemental soil stabilizing practices be needed, straw mulch, fiber rolls, erosion control blankets and/or other BMPs will be used as necessary to control soil erosion. Table 10 provides a fast growing erosion control seed mix that may be used for temporary disturbances (e.g., long-term overburden storage stockpiles).

TABLE 10
NATIVE EROSION CONTROL BROADCAST SEED MIX

Common Name	Scientific Name	Size	lbs/acre
blue wildrye	*Elymus glaucus*	seed	6
California brome	*Bromus carinatus*	seed	6
meadow barley	*Hordeum brachyantherum*	seed	5
six-weeks fescue	*Festuca microstachys*	seed	3.5
California poppy	*Eschscholzia californica*	seed	2.5
		TOTAL	**23**

Note: Composition of seed mix (and appropriate modifications) to be determined based on availability from suppliers, test plot results (if applicable) and species determined most suitable at the time planting occurs.

Agriculture Areas

For areas reclaimed to agriculture (e.g., row crop), fields will be backfilled/leveled as appropriate, graded for positive drainage, and prepared for crop plantings. The ultimate crop type to be planted is at the discretion of the landowner.

2.9.2 Revegetation Test Plots [CCR §3705(b)]

Disturbed mining slopes (in Phase 3) and agricultural backfill areas (in Phase 1) that have reached their final configuration and will not be further disturbed will serve as test plots for the respective revegetation seed mixes. If a portion of the Phase 4 area is seeded with the erosion control mix (from Table 10 above), then test plots may be set up in this area as a substitute for one of the above areas. For detail, see Appendix H at Section VIII, Test Plots.

2.9.3 Revegetation of Roads and Traffic Routes

CCR §3705(d). *Roads stripped of roadbase materials, resoiled and revegetated, unless exempted.*

CCR §3705(f). *Temporary access not bladed. Barriers installed.*

The existing and future perimeter road network are planned to be left in place for safety, fire protection, access between properties, and to facilitate the potential end uses. Temporary roads in the mine floor will be stripped of any roadbase materials, resoiled and revegetated as described above. No temporary access routes are anticipated as part of reclamation.

2.9.4 Noxious Weed Management [CCR §3705(k)]

During the revegetation establishment period, noxious weeds will be managed: (1) when they threaten the success of the proposed revegetation; (2) to prevent spreading to nearby areas; and (3) to eliminate fire hazard. Noxious weeds will be removed using a combination of herbicides,

mechanical controls, and hand weeding. In some cases, complete eradication may not be feasible unless the weed-infested patches are small. Noxious weed identification and management will be an element of the revegetation monitoring period overseen by a qualified biologist.

For additional detail, see Appendix H at Section IX, Weed Control Plan, which includes a full list of priority noxious weeds developed for the CCRMP based on local observations documented in the 2020 Cache Creek Annual Status Report.

2.9.5 Plant Protection Measures, Fencing, Caging [CCR §3705(l)]

Shrubs may be subject to herbivory that could result in damage or loss of plants. At the direction of the restoration contractor, any or all of the following corrective measures may be implemented during plant installation if it is determined that plants may be jeopardized by wildlife:

- Plants susceptible to browsing will be protected using wire cages, tree shelters (e.g., hardware wire cages, etc.), or exclosure fencing (e.g., temporary rabbit fences).
- Wire screening will be installed around the roots of plants to prevent damage attributed to subterranean herbivores (e.g., gophers).
- Protective devices will be maintained in place for at least three years, or until herbivory is no longer a threat to the survival of the plants.
- During annual monitoring visits, the restoration contractor will observe for evidence of browsing and direct implementation of the measures outlined above as appropriate.

2.9.6 Revegetation Performance Standards and Monitoring [PRC 2773(a)]

CCR 3705(m). *Success quantified by cover, density and species-richness. Standards proposed in plan. Sample method set forth in plan and sample size provide 80 percent confident level, as minimum.*

CCR §3705(j). *If irrigated, demonstrate self-sustaining without for two years minimum.*

Monitoring

For wildlife habitat end uses, qualified biologists or botanists will monitor re-vegetated areas annually for a minimum of three years or until the final performance standards outlined below are met. The monitoring program shall be considered complete if during the last two years plantings required no human intervention. If intervention is necessary after the second year of monitoring, then remedial measures will be implemented and monitoring will continue until such time as the performance standards can be met or this Plan is modified.

Monitoring reports will summarize the reclamation responsibilities, construction and revegetation completed, monitoring implemented, and revegetation results compared to established success criteria. Photo documentation and field data will also be provided in

appendices to the monitoring reports. If it is apparent that some reclamation features may not achieve intended success criteria, potential remediation opportunities will be evaluated or suggested and provided in the report. Monitoring results, including photographs, will be submitted as an annual report to the County by November 1 of each monitoring year. For additional detail see Appendix H at Section VII, Monitoring and Reporting.

For agriculture end uses, the Operator will monitor crop yields for two years as described in more detail below.

Revegetation Performance Standards

For areas reclaimed to wildlife habitat, reclamation will be measured against the following year five success criteria (see Appendix H for detail). Vegetation monitoring of the marsh, grassland, and understory (non-trees and shrubs) will be conducted in the same fashion for all of the habitat types, using permanent 1 square meter (approx. 10' x 10') plots.

The revegetation success criteria outlined below will be updated, if necessary, in consultation with the County following monitoring of the proposed test plot.

Perennial Marsh

Habitat Element	Performance Criteria
Vegetation Cover	≥60% per plot avg
Relative hydrophyte Cover	≥60% per plot avg
Relative cover of Native Species	≥60% per plot avg
Average number of Native Species (Species Richness)	≥3 native species per plot avg
Invasive cover	<10%

Riparian Woodland and Oak Savannah

Habitat Element	Performance Criteria
Woodlands	
Average Number of Native Trees	70% of target density *
Height of Trees	≥6’
Shrubs	
Number of Shrubs	70% of target density *
Height of Shrubs	≥2’

* Performance criteria can be met via planted materials or recruitment of native species or a combination of both

Native Grassland Buffer and Savannah Understory

Habitat Element	Performance Criteria

Vegetation Cover (Across all stratums)	≥60% per plot avg
Average Number of Natives (Across all stratums) (Species Richness)	≥3 native species per plot avg
Relative Cover of Natives (Across all stratums)	≥30% per plot avg
Invasive cover (Across all stratums)	<10% per plot avg

2.9.7 Agricultural Fertility Performance Standards [CCR §3707 and CCR §3708]

CCR §3707(a). *Return prime agriculture to fertility level specified in approved plan.*

CCR §3707(c). *Productivity rates equal pre-project or similar site for two consecutive years. Rates set forth in plan.*

CCR §3708. *Other ag capable of sustaining crops common to area.*

The Mine operates on prime agricultural lands as defined by the U.S. Soil Conservation Service (see Table 4 for reference). Table 2 shows the post-reclamation land uses for the six mining phases, as well as the plant site and remaining disturbed areas (e.g., conveyor alignment and creek buffer). Of the total site reclamation, ±419 acres are planned for a return to agriculture. The reclaimed agricultural fields will be backfilled to an elevation at least five feet above the average high groundwater level, consistent with the requirements of SMRO Section 10-5.516. Crops will be grown in the reclaimed areas in rotations as appropriate to sound farming practices in the area. Row crop types are likely to include tomatoes, grains (e.g., wheat), corn and sunflower.

Dellavalle Laboratory, Inc. ("Dellavalle") collected soil samples from existing overburden stockpiles at the Mine to test them for agricultural fertility (see Appendix I, Soil Fertility Results). Dellavalle concluded that there are no limitations to using any of the overburden or open field soils for agricultural crop production.

The following success criteria, consistent with CCR §3707 (performance standards for *prime* agricultural land) are proposed for the portions of the site to be returned to agriculture.

Fertility: Reclaimed areas should be capable of providing sufficient fertility to support reclaimed row crop production, such as tomatoes and grains (e.g., wheat), based on soil testing.

Topsoil Handling: Upon reconstruction of soils, the sequence of horizons will have the A atop the B, the B atop the C, and the C atop graded overburden.

Productivity Rates — Reclamation will be deemed complete when productive capability of the affected land is equivalent to or exceeds, for two consecutive crop years, that of the unmined agricultural lands adjacent to and south of the mining areas.

Amendments: — To prevent contamination of surface or groundwater, fertilizers and other soil amendments will be applied by qualified professionals in accordance with manufacturer specifications. In addition, reclaimed agricultural fields will be restricted from draining into the permanent lakes or Cache Creek.

2.10 Equipment Removal and Incidental Waste Disposal

CCR §3709(a). *Equipment stored in designated area and waste disposed of according to ordinance.*

CCR §3709(b). *Structures and equipment dismantled and removed.*

CCR §3502(b)(5). *Disposition of old equipment.*

Equipment used in mining and reclamation will be stored in designated areas near site access points and removed from the site following final reclamation.

Conveyor equipment will be dismantled and removed as part of reclamation unless needed to facilitate future mining in the area. Fences and roads providing access between properties will be left in place to facilitate the potential end uses.

Any incidental refuse or garbage will be collected, hauled off-site and disposed of in accordance with state and local standards.

The existing asphaltic concrete batch plant and ready-mix concrete batch plant are permitted and operate under separate County-issued entitlements and may be left in place at the Owner's discretion at the time of reclamation to continue to support future mining in the area and/or the construction materials needs of the region.

2.11 Closure of Portals, Shafts and Openings

CCR §3713(a). *Drill holes, water wells, monitoring wells completed or abandoned in accordance with laws.*

CCR §3713(b). *All portals, shafts, tunnels, or openings, gated or protected from public entry, but preserve access for wildlife.*

No portals, shafts, tunnels or other openings to underground workings are mapped or proposed. No drill holes (other than temporary drill holes used for exploration or quality testing purposes) are planned. Any water wells installed in support of surface mining or reclamation activities will

be left in place to facilitate the potential end uses or abandoned in accordance with state and local laws and regulations.

2.12 Administrative Requirements

2.12.1 Statement of Reclamation Responsibility [PRC §2772(c)(10)]

Please see Appendix J, Statement of Reclamation Responsibility.

2.12.2 Financial Assurances [PRC §2773.1]

Financial assurances will remain in effect for the duration of the mining operation and any additional period until reclamation is complete. A Financial Assurance Cost Estimate will be updated annually following approval of this Plan and associated County Use Permit. Financial assurances may be adjusted up or down as appropriate based on updated estimates in future years.

2.12.3 Lead Agency Approvals and Annual Inspection [PRC §§2772.1 and 2774]

Upon Plan approval, the conditions of approval and/or mitigation measures pertinent to Plan requirements will be added to this Plan pursuant to PRC §2772.1(b)(7)(B) as Appendix K, Reclamation Related Conditions of Approval.

The Operator will submit a Mining Operation Annual Report to DMR and the County. This report will summarize the previous year's production and reclamation activities. SMARA also requires the County to conduct an annual inspection of the site to ensure compliance with the approved Plan.

2.12.4 All Mining Operations Since 1/1/76 Included in Reclamation Plan [PRC §2776]

Other than the processing plant site (portions of which have been in operation since approximately 1971) that is included in this Plan's boundary, no pre-1976 mining disturbances are apparent at the Mine.

2.12.5 Mining in 100-year Floodplain and Within One Mile of State Highway Bridge [PRC §2770.5]

Portions of Phase 1 of the Mine are located within the 100-year floodplain of Cache Creek, Zone A, as mapped by the Federal Emergency Management Agency ("FEMA") on its Flood Insurance Rate Map ("FIRM") No. 06113C0412G effective June 18, 2010. In addition, the Mine is located within one mile of the Interstate 505 bridge at Cache Creek. Therefore, because the Operator has requested a renewal (extension) of its permit in connection with approval of this Plan, the County (lead agency) is required to notify the State Department of Transportation ("DOT") that the application has been received. The DOT shall have a period of not more than 45 days to review and comment on the proposed surface mining operations with respect to any potential

damage to the state highway bridge from the proposed surface mining operations. The lead agency shall not issue or renew the permit until the DOT has submitted its comments or until 45 days from the date the application for the permit was submitted, whichever occurs first.

3.0 LEAD AGENCY REQUIREMENTS [PRC §2772(C)(11)]

Section 3.0 of this Revised Plan addresses specific lead agency reclamation requirements, where it is believed those requirements either supplement or amplify the requirements of SMARA as outlined in Section 2.0. This part is not intended to restate or address every SMARA code section or policy related to the reclamation of mined lands.

Yolo County recognizes that the extraction of sand and gravel is essential to the continued economic well-being of the state and to the needs of society. Although the County encourages the production of sand and gravel, it believes that consideration must also be balanced by other societal values, including but not limited to recreation, water resources, wildlife, agriculture, and aesthetics.

For context, surface mining is regulated by Yolo County primarily through the Off-Channel Mining Plan (a component of the County's General Plan). The OCMP contains the structure and policies for implementing a program to manage the wide variety of resources associated with Cache Creek, including habitat, water resources, aggregate, agriculture, and recreation. The OCMP primarily regulates mine reclamation through the Surface Mining Reclamation Ordinance ("SMRO"), which contains detailed and specific reclamation performance standards. The SMRO also directs the information needed for reclamation plan applications, and provides regulations that relate to financial assurances, reporting, inspections, and violations.

This Section 3.0 only addresses requirements that specifically relate to the reclamation of mined lands, and not those requirements associated with regulation of the mining activities (e.g., development standards), including any associated environmental review or land use approvals.

3.1 Surface Mining Reclamation Ordinance

SMRO Section 10-5.601 sets forth minimum contents for reclamation plan applications, each of which is specifically addressed below.

3.1.1 Narrative Description of the Proposed Use of Mined Lands and the Manner in Which Reclamation will be Accomplished [§10-5.601(a)]

A narrative description of the proposed use of mined lands after reclamation has been completed and the manner in which reclamation will be accomplished are addressed in Sections 1.0 and 2.0, above.

3.1.2 General Plan, Zoning and SMRO Consistency [§10-5.601(a)(1)]

The Mine's General Plan and Zoning designations are provided in Table 3. The General Plan designation of Agriculture supports surface mining (see General Plan Policy LU-1.1 at page LU-

14) and all areas proposed for mining have this designation. The portions of the site that carry the Open Space designation apply to the portions of the parcels associated with Cache Creek. Further, the General Plan supports the continuation of mining through the following policies:

Policy ED-1.2 Support the continued operation of existing aggregate mining activities within the county as well as new aggregate mining in appropriate areas, to meet the long-range construction needs of the region.

Policy ED-1.8 Retain and encourage growth in important economic export sectors, including mining, natural gas, tourism and manufacturing.

Surface mining is allowed in the A-N zone with approval of a Major Use Permit for lands that are in the OCMP area on lands within the mineral resources overlay zone (see Yolo County Code, Title 8, §8-2.304 and §8-2.306(t)). The Project site is within this area and carries a mineral resource zone "SG" (sand and gravel) overlay.

This Plan's consistency with the SMRO is detailed in Table 11, below. Other than the County General Plan and the County CCAP, which is implemented through the OCMP and its respective ordinances, the Operator is not aware of any other Specific Plan applicable to the Project.

TABLE 11
SMRO CONSISTENCY MATRIX

SMRO Performance Standard	Project Consistency
10-5.501. Scope.	Consistent. The Revised Reclamation Plan will return the site to end uses of agriculture, permanent lake, and wildlife habitat, which are consistent with the General Plan and Zoning designations for the site. Consistency with specific performance standards are set forth below, and described in more detail in the Revised Reclamation Plan.
10-5.502. Aesthetics.	Consistent. The Revised Reclamation Plan includes an updated Habitat Restoration Plan that promotes aesthetic quality for reclaimed conditions.
10-5.503. Backfilled excavations: groundwater flow impacts.	Consistent. No change (increase) in mining depth or reclamation backfill depths are proposed. Consistent with existing entitlements, the Revised Reclamation Plan proposes backfills for the purpose of reclaiming portions of the mine to agriculture, which is a high priority mine reclamation end use in the CCAP. Luhdorff & Scalmanini concluded the Project would not adversely impact off-site wells (see the groundwater assessment included as an appendix to the Revised Reclamation Plan).
10-5.504. Backfilled excavations: Improvements.	Consistent. No change. No new improvements are proposed to be constructed in reclaimed mining pits.
10-5.505. Backfilled excavations: Inspections.	Consistent. Acknowledged.
10-5.506. Bank stabilization maintenance.	Consistent. No change. No new bank stabilization features are proposed as part of the Project. CEMEX will continue to update its Financial Assurance Cost Estimate on an annual basis and submit it to the County for review and approval. CEMEX will also continue to have an annual inspection conducted by a Registered Civil Engineer as a component of its Annual Report pursuant to OCSMO §10-4.701 and SMRO §10-5.1205.
10-5.507. Drainage.	Consistent. The Revised Reclamation Plan provides for drainage to minimize erosion and convey runoff from reclaimed mining areas to natural outlets and interior basins (see Plan at Section 2.6.2). See also Revised Reclamation Plan Sheets R-02, and R-04 through R-07 for drainage detail.

SMRO Performance Standard	Project Consistency
10-5.508. Erosion control.	Consistent. No substantial change to current practices. Reclamation timing and revegetation practices are described in the Revised Reclamation Plan.
10-5.509. Fence row habitat.	Consistent. The Revised Reclamation Plan provides for ground cover along the margins of reclaimed agricultural fields (see Plan at Section 2.9).
10-5.510. Fencing.	Consistent. Fencing is in place around the perimeter of mining areas and will be expanded in the future as needed. See Revised Reclamation Plan Sheets R-04 through R-07 for fence locations.
10-5.511. Field drainage.	Consistent. Reclaimed agricultural surfaces are designed for positive drainage. See Revised Reclamation Plan Sheets R-04 through R-07.
10-5.512. Field releveling.	Consistent. No change. Acknowledged.
10-5.513. Floodplain development.	The Project proposes no new development in the floodplain.
10-5.514. Habitat management plan compliance.	Consistent. The Revised Reclamation Plan includes an updated Habitat Restoration Plan that complies with SMARA, the OCSMO and the SMRO.
10-5.515. Habitat plan referral.	Consistent. Acknowledged. The updated Habitat Restoration Plan can be presented to agencies for review as part of the Project CEQA process.
10-5.516. Lowered elevations for reclaimed agricultural fields.	Consistent. Reclaimed agricultural surfaces are designed to be at least five feet above average high groundwater. See Revised Reclamation Plan Sheets R-04 through R-07.
10-5.517. Mercury bioaccumulation in fish.	Consistent. No change. Permanent lake end uses were approved under existing entitlements and were fully analyzed in the 1996 EIR.
10-5.518. Mining in reclaimed lands.	Consistent. Acknowledged. Once reclamation is complete, no further mining will occur without approval of an amendment to the mining permit and reclamation plan.
10-5.519. Motorized watercraft prohibition.	Consistent. No change. With the exception of the existing dredge, no motorized watercraft are allowed on the lakes.
10-5.520. Operational areas.	Consistent. Operational areas and haul roads that are not required to facilitate future end uses will be reclaimed as set forth in the Revised Reclamation Plan. See, for example, Plan Section 2.2.2.

SMRO Performance Standard	Project Consistency
10-5.520.1. Parkway plan consistency.	Consistent. No change. Restoration along Cache Creek and development of permanent lake end uses were approved under existing entitlements and were fully analyzed in the 1996 EIR.
10-5.520.2. Permanent easements.	Consistent. No change. Upon completion of reclamation within each phase of the project, for land that will not be dedicated or deeded to the County, the operator will enroll each parcel reclaimed to agriculture in Williamson Act contract, or other equivalent long-term easement or deed restriction satisfactory to the County, for the purpose of protecting the agricultural use of the reclaimed land in perpetuity.
10-5.521. Permanent stockpiles.	Consistent. Mine waste and overburden stockpiles will be removed as described in the Revised Reclamation Plan at Section 2.6.3.
10-5.522. Phasing plans.	Consistent. The Revised Reclamation Plan proposes the mine to be developed and reclaimed in six phases (see, for example, Sheet R-03).
10-5.523. Planting plans.	Consistent. An updated Habitat Restoration Plan prepared by a qualified biologist is included as an appendix to the Revised Reclamation Plan.
10-5.524. Post-reclamation groundwater monitoring.	Consistent. No change. CEMEX anticipates that the County will maintain and/or adopt conditions of approval as appropriate.
10-5.525. Prime farmland conversion.	Consistent. The Revised Reclamation Plan maximizes the acreage to be reclaimed to agriculture, while adhering to the requirement of SMRO 10-5.516. Potential impacts to prime farmlands will be evaluated in the Project CEQA document. If needed, CEMEX anticipates that the County will adopt mitigation measures and conditions of approval as appropriate.
10-5.526. Repair of damage due to natural disaster.	Consistent. No change. CEMEX will continue to update its Financial Assurance Cost Estimate on an annual basis and submit it to the County for review and approval.
10-5.527. Recreational and habitat uses of permanent wet pits.	Consistent. The updated Habitat Restoration Plan included as part of the Revised Reclamation Plan accounts for groundwater fluctuations in permanent wet pits.

SMRO Performance Standard	Project Consistency
10-5.528. Sewage storage prohibition.	Consistent. No change. The Project does not propose to use wet pits for storage and treatment of sewage effluent or for landfill purposes.
10-5.529. Shallow depths.	Consistent. The updated Habitat Restoration Plan included as part of the Revised Reclamation Plan provides for habitat restoration around the shoreline of the permanent lakes.
10-5.530. Slopes.	Consistent. Final reclaimed slopes have been evaluated in the Slope Stability Evaluation (Geocon 2018) included as an appendix to the Revised Reclamation Plan. Final slope angles have an adequate factor of safety for the proposed end uses.
10-5.531. Soil ripping.	Consistent. The requirement for ripping A- and B-horizon soils to a depth of three feet is included in the Revised Reclamation Plan at Section 2.8 (Resoiling).
10-5.532. Use of overburden and fine sediments in reclamation.	Consistent. No change. The Project does not propose to use sediment fines associated with processing for backfill or reclamation of permanent lakes. Aggregate process wash fines will continue to be pumped to settling ponds, which will ultimately be reclaimed to agriculture end uses.
10-5.533. Wetland habitat.	Consistent. The Revised Reclamation Plan provides for permanent lakes with scalloped basin perimeters, peninsulas, grassland margin habitat, and islands (in Phases 5 and 6). See Revised Reclamation Plan Sheets R-03 and R-06
10-5.534. Exceptions.	Consistent. No exceptions are currently proposed or believed to be necessary.

3.1.3 Contamination Control [§10-5.601(a)(2)]

See Sections 2.6.2 and 2.6.3.

3.1.4 Erosion Minimization for Affected Streambed Channels and Streambanks [§10-5.601(a)(3)]

See Sections 2.6.2 and 2.6.4. Flood protection is already in place (see Appendix B).

3.1.5 Effect that Reclamation will have on Future Mining [§10-5.601(a)(4)]

See Section 2.2.3.

3.1.6 Time Schedule of Reclamation Activities [§10-5.601(a)(5)]

See Table 1 in Section 2.1.6.

3.1.7 Compliance with Minimum Performance Standards [§10-5.601(a)(6)]

See Table 12 in Section 3.1.2.

3.1.8 Signed Statement of Reclamation Responsibility [§10-5.601(a)(7)]

See Appendix J.

3.1.9 Acreages of Proposed Reclaimed Uses [§10-5.601(a)(8)]

See Table 2 in Section 2.2.1.

3.1.10 Drainage and Erosion Control After Reclamation; 100-Year Flood Protection [§10-5.601(a)(9)]

See Section 2.6.2.

3.1.11 Maximum Disturbance at One Time [§10-5.601(a)(10)]

The Plan covers ±816 acres of maximum surface disturbance area, which will be reclaimed in a phased manner as set forth in Table 1 in Section 2.1.6.

3.1.12 Williamson Act Contracts or Agricultural Preserves [§10-5.601(a)(11)]

The Operator is not aware of any active Williamson Act contracts covering the site, or any agricultural preserves on the site. Mining in Phases 3 through 6 will occur on lands that have been at least partially defined as prime farmlands.

3.1.13 Narrative Description of the Type of Surface Mining to be Employed [§10-5.601(b)]

See Section 2.1.6.

3.1.14 Name and Address of Operator and Agent for Application Processing [§10-5.601(b)(1)]

See Section 2.1.1. In addition to itself, the Operator has designated Compass Land Group, this Plan's preparer, as an agent for application processing.

3.1.15 Anticipated Quantity and Type of Materials [§10-5.601(b)(2)]

See Section 2.1.2.

3.1.16 Proposed Dates for Initiation and Termination of the Surface Mining Operation [§10-5.601(b)(3)]

See Section 2.1.3.

3.1.17 Maximum Anticipated Depth [§10-5.601(b)(4)]

The maximum anticipated depth is 70 feet bgs, consistent with the original Solano Long-Term Off-Channel Reclamation Plan No. ZF #95-093.

3.1.18 Evidence that all Owners of Possessory Interest have given Authority to Mine and Reclaim in Accordance with Plan [§10-5.601(b)(5)]

CEMEX owns and operates the Mine. Please see also Appendix J.

3.1.19 Acreage of the Lands Affected and Legal Descriptions [§10-5.601(b)(6)]

See Tables 2 and 3, as well as Sheets M-01 and R-01.

3.1.20 Description of Geology [§10-5.601(b)(7)]

See Section 2.3.3, as well as Figure 3.

3.1.21 Names and Addresses of Owners [§10-5.601(b)(8)]

See Reclamation Plan Summary for Owner's address and contact information and Section 2.3.1 for a parcel-by-parcel listing of ownership. CEMEX owns all parcels to be mined and reclaimed.

3.1.22 Site Specific Technical Studies [§10-5.601(c)]

The following site-specific technical studies are appended to this Plan:

Appendix A	Biological Resources Update (Zentner)
Appendix B	Hydraulic Analysis of the CEMEX Reach (Cunningham Engineering)
Appendix C	Groundwater Assessment (Luhdorff & Scalmanini)
Appendix D	Estimation of Average High Groundwater Levels (Luhdorff & Scalmanini)
Appendix E	Estimate of Average Low Groundwater Levels (Luhdorff & Scalmanini)
Appendix F	Slope Stability Evaluation (Geocon)
Appendix G	Letter Recommendation for Drainage to Riparian Depressions (Zentner)
Appendix H	Habitat Restoration Plan (Zentner)
Appendix I	Soil Fertility Results (Dellavalle Laboratory)

3.1.23 Site Plan and Cross Sections [§10-5.601(d)-(f)]

See Sheets M-01 through M-15, and Sheets R-01 through R-15.

3.1.24 Estimate of Financial Assurances [§10-5.601(g)]

The Operator has an existing Financial Assurance Cost Estimate and Financial Assurance Mechanism (bond) on file with the County, which will continue to be updated annually and submitted to the County for review and approval.

3.1.25 Land Survey or Record of Survey [§10-5.601(h)]

Sheet M-03 reflects the Record of Survey filed January 12, 2018, in 2018 Book of Maps at pages 2-4.

3.1.26 Initial Environmental Assessment [§10-5.601(i)]

An "Applicant's Draft Initial Study" was submitted to the County under separate cover as part of the project application filed in February 2018.

3.1.27 Discretionary Permits Required by Other Public Agencies [§10-5.601(j)]

CEMEX is not aware of any other applicable discretionary permits required by other public agencies to carry out mining and reclamation in the manner set forth in this Plan.

3.1.28 Chart of SMARA Contents [§10-5.601(k)]

See page "vi" at the beginning of this Plan.

ZENTNER
Planning & Ecology

CEMEX Cache Creek Mine
Habitat Restoration Plan

Project No.:
1076 CMX

Zentner Planning & Ecology
Oakland, CA

Prepared for:
Cemex

Revised:
October 2022

TABLE OF CONTENTS

I. INTRODUCTION

Zentner Planning and Ecology (Zentner) has prepared this Habitat Restoration Plan (Plan) in support of the CEMEX Construction Materials Pacific, LLC. (CEMEX) Cache Creek Mining Permit and Reclamation Plan Amendment Project (Project). Specifically, CEMEX proposes to modify Long-Term Off-Channel Mining Permit No. ZF #95-093, Reclamation Plan No. ZF #95-093 and Development Agreement No. 96-287 (as subsequently amended, "Existing Entitlements") with revised mining and reclamation plans and a 20-year time extension.

This Plan is an update of the mine's existing Habitat Restoration Plan (Zentner and Zentner 1995), which was originally approved in 1996 as a component of the Existing Entitlements and subsequently amended to address conditions of approval. This Plan will become effective only upon County approval of the proposed Project.

The Habitat Restoration Plan has been developed to guide the restoration of natural habitats at the Project Site as part of mine reclamation. This Plan is written to comply with the California Surface Mining and Reclamation Act of 1975 (SMARA) regulations and the Yolo County Off-Channel Surface Mining Ordinance (OCSMO) and Surface Mining Reclamation Ordinance (SMRO), and bring more focus to revegetating the remainder of the quarry along with performance standards that meet current SMARA regulations.

While CEMEX's Revised Reclamation Plan will include returning much of the site to agriculture, reclamation end uses will also feature habitats including open water lakes, riparian woodland, perennial marsh, oak savannah and native grassland buffers adjacent to restored habitats.

A. Objectives

This Plan details the overall objectives and methods for habitat restoration, including resoiling, restoration planting, performance standards, monitoring, reporting, weed control and maintenance. Zentner has 20 plus years' experience with on-site monitoring and maintenance and considers the restoration methods to be highly effective for the conditions present at the mine.

II. SETTING

A. Existing Conditions

The CEMEX Cache Creek Mine ("Mine", sometimes also referred to as the Madison Quarry or Madison Plant) is an active sand and gravel mining operation currently approved on ±586 acres between Highway 16 and Cache Creek (**Figure 1**). Interstate 505 marks the site's western boundary with the exception of a small portion of site (final phase) lying west of the Interstate. CEMEX's existing processing plant facilities are located near the western end of the property, just west of the entrance road, which runs north off of Highway 16. Just east of the plant is a former mined pit (part of Phase 1) that has already been reclaimed to agricultural production. Further to the east are active mine pits, some of which are open water as a result of permitted excavation into groundwater. The southern bank of Cache Creek is buffered from the active pits by at least a 200-foot buffer.

B. Site Ecology

The site consists primarily of mining and agricultural land that is in various stages of mining or reclamation. Agricultural production on and around the site is mainly row crops. Riparian vegetation forms a relatively narrow band on the southern bank of Cache Creek (north side of the Mine), which drops about 35 feet below the agricultural plain where mining is taking place. Remnant sections of riparian habitat also lay in depressions within the 200-foot buffer between the Creek and the mining pits (hereafter referred to as "riparian depressions"). Annual grassland with sections of ruderal vegetation is found around the perimeter of the agricultural and actively mined areas as well as in much of the 200-foot buffer.

C. Soils

The parent material of all Project area soils is quaternary alluvium. Its thickest local unit is sand and gravel, but the high terrace south of Cache Creek is largely covered by varying thicknesses of loamy material that permit it to be farmed.

The soils of the creek and flood channels tend to be coarse and excessively drained with finer sediments washing away downstream. The soil series for the creek and bank include Riverwash and Soboba Gravelly Sandy Loam (SCS 1972).

Immediately adjacent to the creek are the flats, which are a highly variable mix of relatively coarse to medium textured loams. The band closest to the creek is mapped as Sycamore silt loam and the one south of that as Yolo silt loams (SCS 1972). In general, the farther away from the creek channel, the more finer-grained the soil, which once supported oak savannah and native grassland.

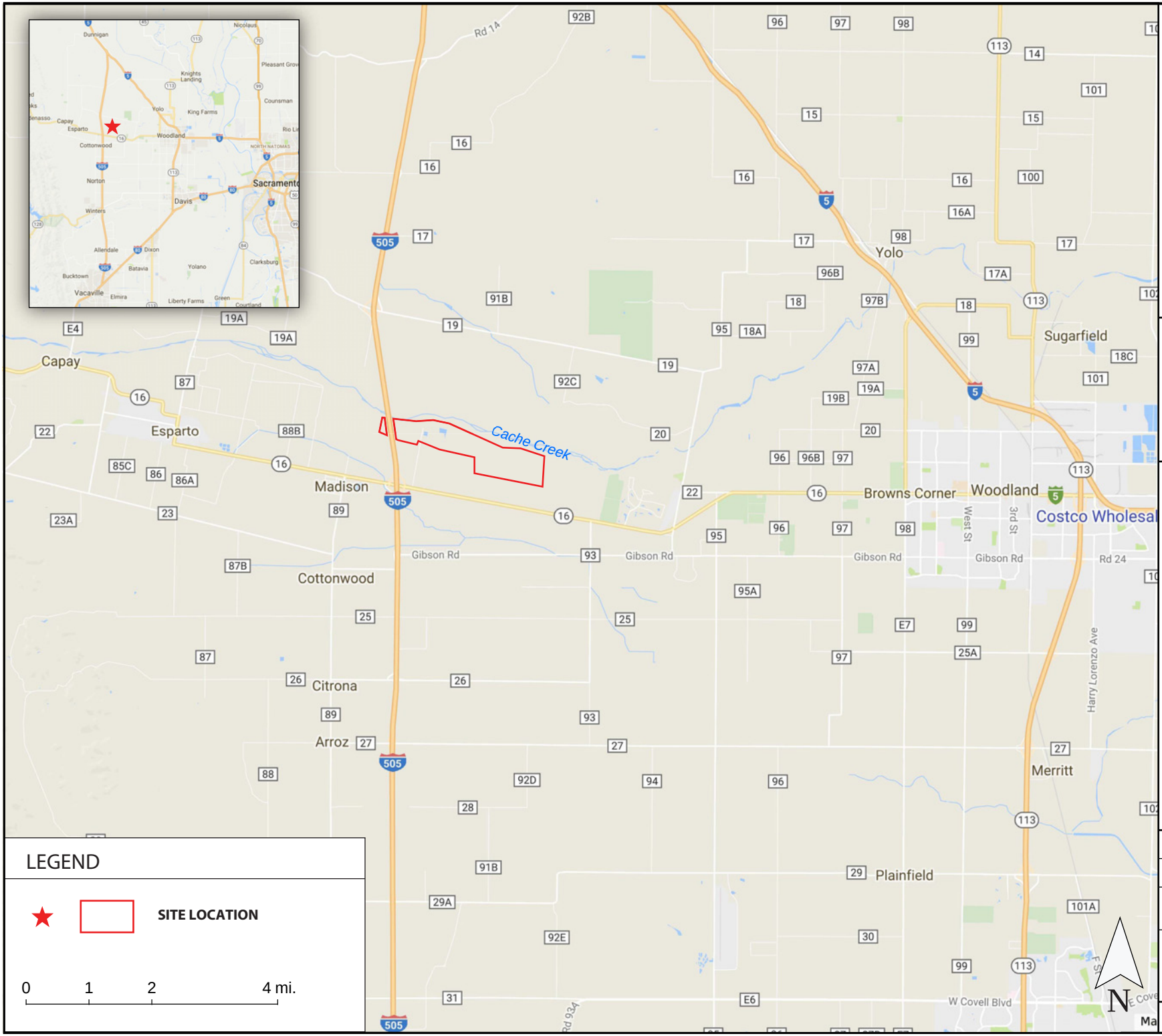

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FIGURE 1
SITE LOCATION

CACHE CREEK
CEMEX MINE
Madison, California

BY: **CJL**

PROJECT: **1076**

BASE MAP:
GOOGLE MAPS 2017

FILE:
D:\Graphic Designer\My Documents\PROJECTS\1000-1100\1076 Cache Creek\Adobe\1076 site location 17-11-09

DATE: **11/09/2017, 04:28 pm**

D. Habitats and Vegetation

1. Perennial Marsh

Perennial marsh is restricted to the periphery of the deeper pools found within Cache Creek. These pools usually are formed within eroded cuts near the toe of the creek banks or within beaver dams that are common throughout the channel. These marshes support deep-rooted perennials such as bulrush (*Schoenoplectus acutus*), cattail (*Typha sp.)* and rushes (*Juncus sp.)*.

2. Riparian

The riparian vegetation on site is primarily located near the toe of the creek banks along Cache Creek. It is also found in old carved out creek meanders on both the north and south banks, with some of the old meanders relatively high in elevation compared to the existing channel bed. A few of these old meanders are located within the Project Site within a distance of approximately 150 feet of the channel bed. These riparian areas are dominated by various species of willows (*Salix sp.),* Fremont cottonwood (*Populus fremontii*), and mulefat (*Baccharis salicifolia*).

3. Oak Savanna

The oak savanna runs along a relatively narrow band near the top of the southern bank of Cache Creek (north side of the Mine). This habitat, which is dominated by valley oak (*Quercus lobata*) with an understory of annual grassland, likely covered much of the region in proximity to Cache Creek prior to human disturbance.

4. Annual Grassland

Perennial grassland habitat, along with oak savanna, likely once co-dominated the entire site from the banks of Cache Creek to the southern edge of the property along Highway 16. The existing grassland is dominated by non-native, annual grasses such as wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut (*Bromus diandrus*), and rye (*Festuca perennis*). It is found along the upper banks of Cache Creek and on the terrace between the creek and the active mining areas and agricultural areas. A more ruderal form of the annual grassland is found along the margins of these mined areas and the agricultural parcels.

5. Ruderal

A portion the annual grassland habitat is dominated by ruderal (weedy) vegetation. These areas are generally located near the CEMEX processing plants or in disturbed areas adjacent to mining or agricultural fields. Habitat in these areas are dominated by thistles (milk thistle, *Silybum marianum*; bull thistle, *Cirsium vulgare*), starthistle (*Centaurea solstitialis*) and other weedy species.

III. RESTORATION PLAN

Restoration is proposed for the areas around the reclaimed agricultural fields, around the created lakes, and between Cache Creek and the reclaimed habitats (**Figure 2**). These restored habitats will not only provide buffers, but will also provide native habitat and wildlife corridors between the reclaimed mining areas and the creek and along the south bank of Cache Creek (**Figure 3**).

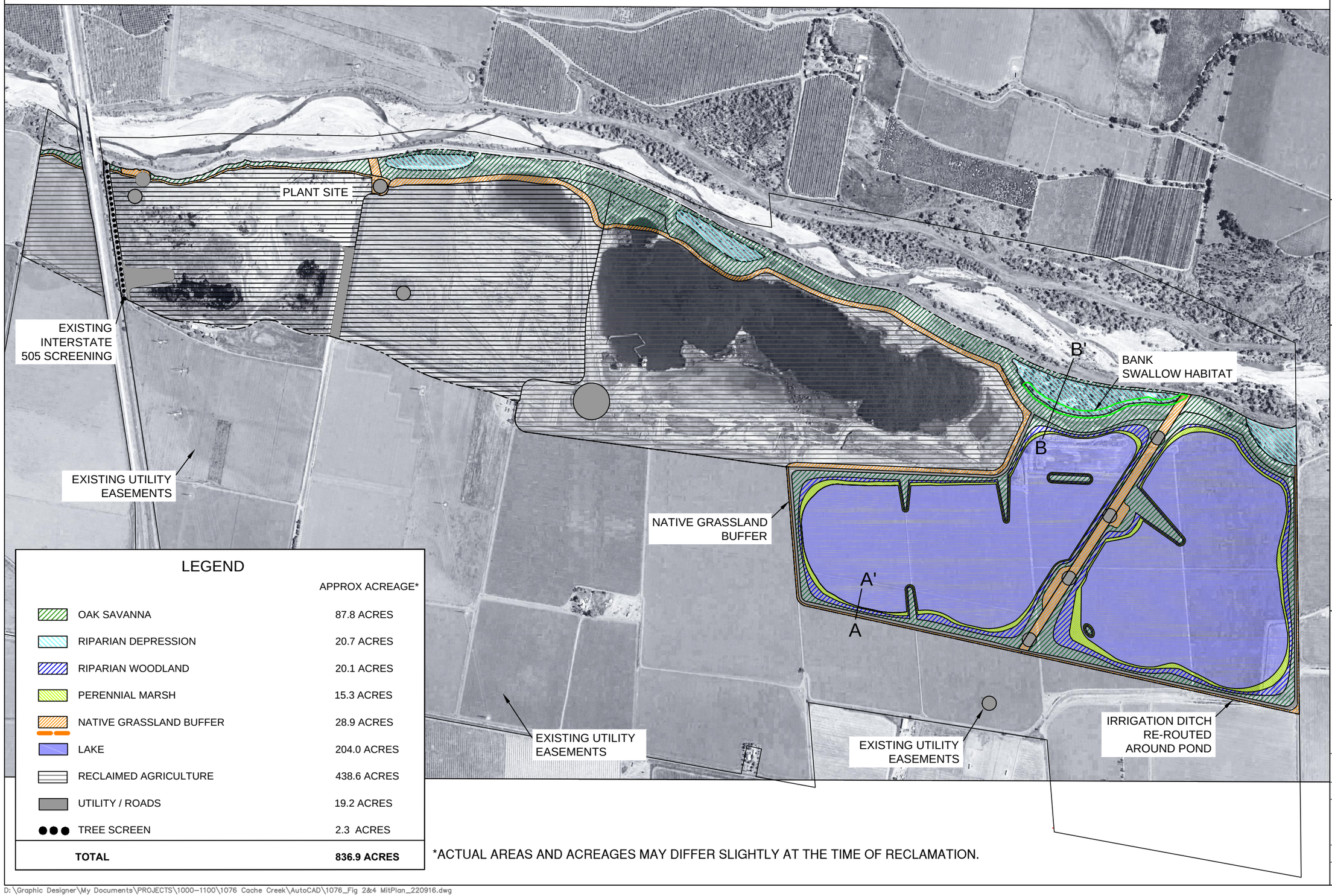
A. Goals for Restoration

This plan is designed to meet the goals and objectives of the OCSMO, SMRO and SMARA to provide for the protection and beneficial use of mined lands. In particular, the goal of this Plan is to create quality, self-sustaining habitats that provide native plant diversity for native wildlife where doing so is consistent with planned end uses. To meet these goals the Plan includes the following principles:

1. Provide for a diversity of native habitat types and vegetative communities that have the potential to support a variety of native wildlife including special status species.
2. Provide native grassland buffers around reclaimed agricultural parcels as well as a wide, continuous native buffer between Cache Creek and reclaimed habitats.
3. Provide a continuous corridor between the lakes and Cache Creek.
4. Provide for a structurally diverse shoreline around the lakes with variable slopes and communities.
5. Provide diverse riparian habitats around the lakes and within the preserved depressions to provide important roosting and nesting habitats.

B. Restored Habitats

This section describes this Plan's restored habitat objectives. The restoration phasing and approximate acreage by each phase is shown in **Figure 4**. The primary objectives are to restore native habitats onsite for diversity and wildlife. These reclaimed and restored habitats will be an integrated, sustainable, and biologically diverse system formed by a variety of natural communities. The habitats will be restored to a condition equal to or greater, than what existed prior to the project. Planting details are described later in Section V of the Plan.



LEGEND

	APPROX ACREAGE*
OAK SAVANNA	87.8 ACRES
RIPARIAN DEPRESSION	20.7 ACRES
RIPARIAN WOODLAND	20.1 ACRES
PERENNIAL MARSH	15.3 ACRES
NATIVE GRASSLAND BUFFER	28.9 ACRES
LAKE	204.0 ACRES
RECLAIMED AGRICULTURE	438.6 ACRES
UTILITY / ROADS	19.2 ACRES
TREE SCREEN	2.3 ACRES
TOTAL	**836.9 ACRES**

*ACTUAL AREAS AND ACREAGES MAY DIFFER SLIGHTLY AT THE TIME OF RECLAMATION.

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FIGURE 2
RESTORATION PLAN

CEMEX
CACHE CREEK MINE
MADISON, CALIFORNIA

N

0 500' 1000'

SOURCE: GOOGLE EARTH 5/20/17
CUNNINGHAM ENGINEERING 10/20/17

PROJECT NO. 1076

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BY: JPE / XM

DATE: 9/28/2022

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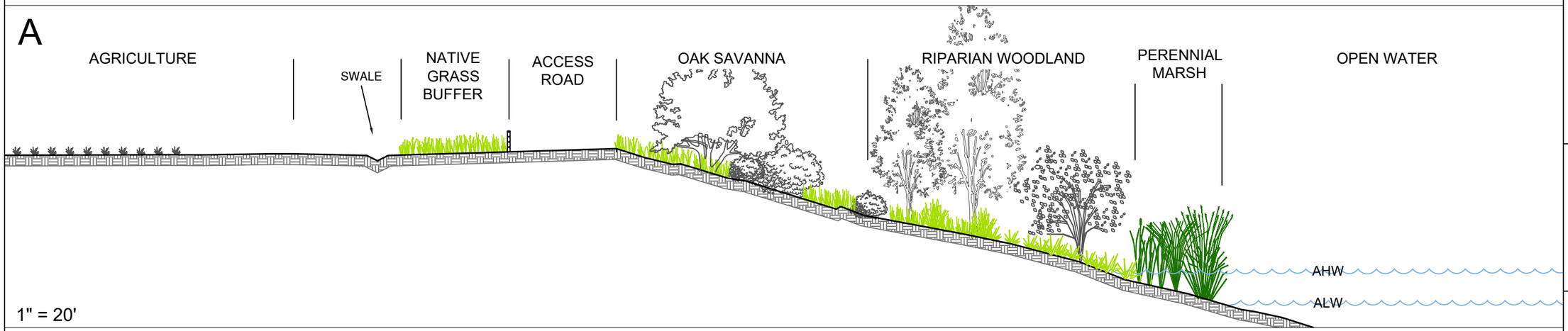
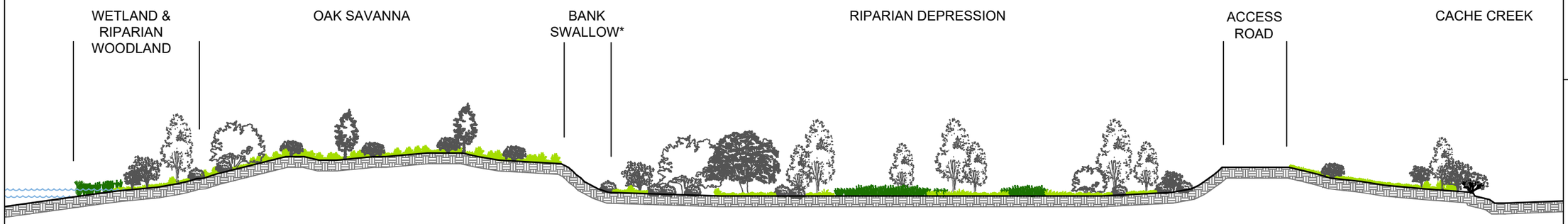


1" = 20'

B



1" = 60'

NOTES:

1. ACTUAL DISTANCES AND AREAS MAY VARY SLIGHTLY AT THE TIME OF RECLAMATION.
2. *BANK SWALLOW HABITAT PRESERVED WHERE APPLICABLE.

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FIGURE 3
TYPICAL CROSS SECTIONS

CEMEX
CACHE CREEK MINE
MADISON, CALIFORNIA

N

SCALE VARIES

SOURCE: CUNNINGHAM ENGINEERING

PROJECT NO. 1076

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BY: CJL

DATE: 9/28/2022

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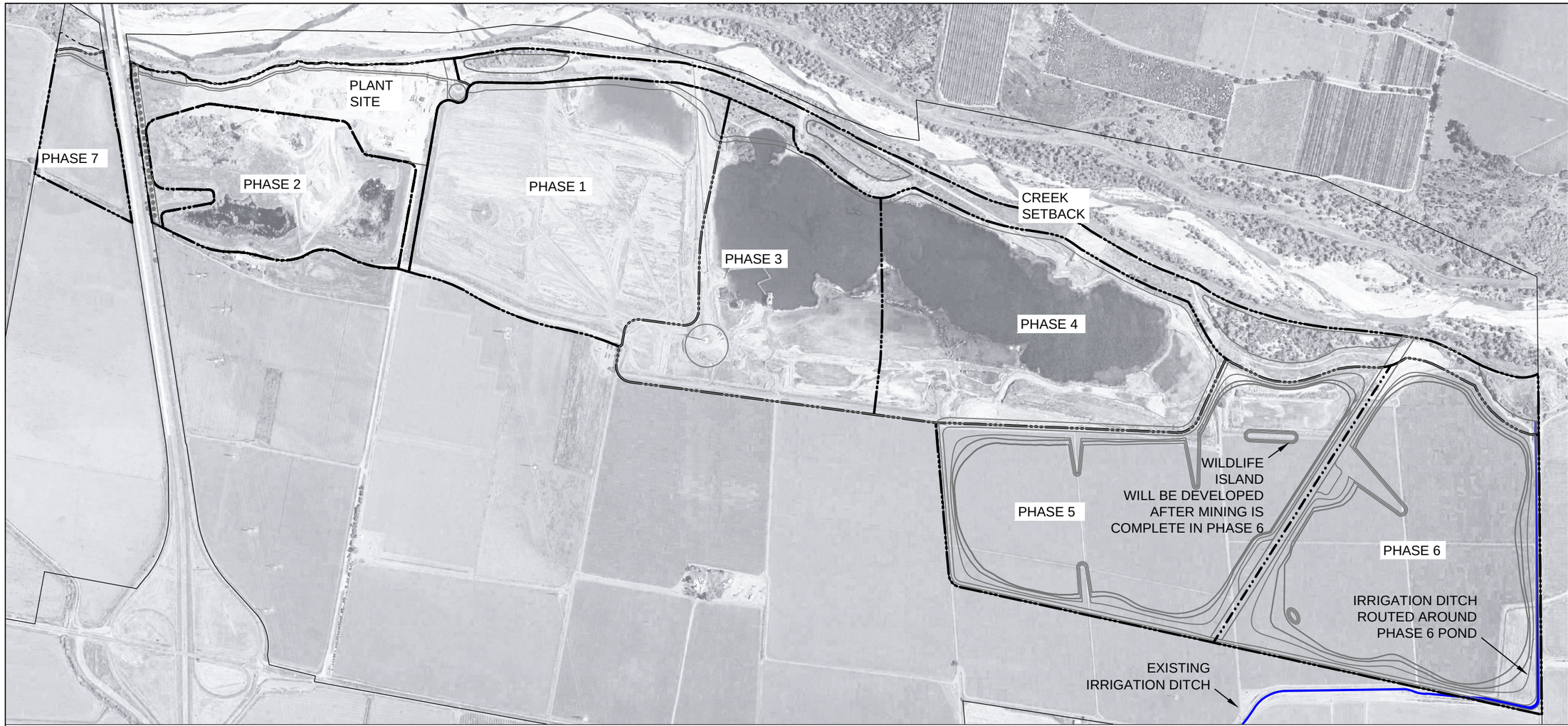

NOTES:

* ACTUAL AREAS AND ACREAGES MAY DIFFER SLIGHTLY AT THE TIME OF RECLAMATION.

* SHORELINE HABITAT ACREAGE IS INCLUDED AS PART OF THE OAK SAVANNA, RIPARIAN WOODLAND, AND PERENNIAL WETLAND ACREAGES

* ISLANDS TOTAL 1.6 ACRES AND PENINSULAS TOTAL 4.6 ACRES. THE ADDITIONAL ACREAGES ARE INCLUDED AS PART OF THE PERENNIAL MARSH, RIPARIAN WOODLAND, AND OAK SAVANNA HABITATS WITH A CORRESPONDING DECREASE IN THE OVERALL ACREAGE OF THE LAKE HABITAT.

* CEMEX HAS PROPOSED TO ELIMINATE PHASE 7 FROM THE PROJECT.

APPROXIMATE ACREAGE BY PHASE*

	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	CREEK SETBACK	PLANT SITE	OTHER BUFFER	I-505 BUFFER	APPROX TOTAL
OAK SAVANNA	1.9	0	3.7	0	14.4	16.0	0.8	47.3	3.7	0	0	**87.8**
RIPARIAN DEPRESSION	0	0	0	0	0	0	0	20.7	0	0	0	**20.7**
RIPARIAN WOODLAND	0	0	0	0	9.8	10.3	0	0	0	0	0	**20.1**
PERENNIAL MARSH	0	0	0	0	7.1	8.2	0	0	0	0	0	**15.3**
NATIVE GRASSLAND BUFFER	3.9	0	1.7	8.1	5.6	6.1	0.3	0.7	2.5	0	0	**28.9**
LAKE	0	0	0	0	102.9	101.1	0	0	0	0	0	**204.0**
RECLAIMED AGRICULTURE	124.5	63.7	91.7	111.3	0	0	20.0	0	27.4	0	0	**438.6**
UTILITY / ROADS	0.4	0	2.9	0	5.9	4.1	0.0	0.03	1.3	4.6	0	**19.2**
TREE SCREEN	0	0	0	0	0	0	0	0	0	0	2.3	2.3
SHORELINE HABITAT	0	0	0	0	27.5	33.2	0	0	0	APPROX TOTAL		836.9

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FIGURE 4
RESTORATION PHASING

CEMEX
CACHE CREEK MINE
MADISON, CALIFORNIA

N

0 500' 1000'

SOURCE: GOOGLE EARTH 5/20/17
CUNNINGHAM ENGINEERING 10/20/17

PROJECT NO. 1076

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BY: JPE / XM

DATE: 11/18/2022

1. Lake

The lake habitat will be created by mining in the Phase V and VI areas. The surrounding lake slopes will be restored with riparian woodland and oak savannah habitats (see below). Each lake will contain an island that will provide refugia and potential nesting habitat for native waterfowl and other wildlife. The islands will total approximately 1.6 acres and they will be reclaimed after mining in Phase V and VI. The islands will also be planted with perennial marsh, riparian woodland and oak savannah habitats (**Figure 5**).

The Phase V and Phase VI lakes will also include peninsulas that extend into the lakes. Three peninsulas are proposed within the Phase V lake and one peninsula is proposed in the Phase VI lake (Figure 5). The peninsulas will have a combined area of 4.6 acres. The geographic position of the peninsulas may be adjusted over time based on the mine plan, however, the total surface area of the peninsulas will remain the same. Similar to the island, the peninsulas will provide refugia and potential nesting habitat for waterfowl and other wildlife. The peninsulas will be planted with perennial marsh, riparian woodland, and oak savannah habitat.

2. Riparian Woodland

The riparian woodland restoration will take place along the fringes of the mined lakes, edges of the peninsulas, fringes of the islands, and within the riparian habitat depressions along the creek buffer (**Figure 2**). Lake banks above water will be graded to provide a range of slopes between 2:1 and 4:1 or flatter (**Figure 3**). This will provide for a variable shoreline resulting in more structurally diverse habitats around its perimeter. The groundwater, which provides the water levels in the lakes, will fluctuate as much as five to ten feet in elevation (from average high to average low water). The riparian vegetation will be planted where it would naturally occur, which is starting from just inside the average high water mark to about halfway up the slopes.

The peninsulas will be graded at a 2:1 slope or flatter. Similar to the other parts of the lakes, riparian woodland will be planted from just below the average high water mark to about halfway up the slope. Perennial marsh habitat will be planted below the riparian woodland and oak savannah above (**Figure 6**).

The islands slopes will be graded at 2:1 beginning at 5 feet below low water and above and may transition to 1:1 slopes below this level. Therefore, the elevational band of riparian woodland beginning at average high water is expected to be somewhat more compressed along the fringes of the islands than around the perimeter of the lakes (Figure 5). Nevertheless, the result will be a sizable band of riparian vegetation relative to the islands, which will transition

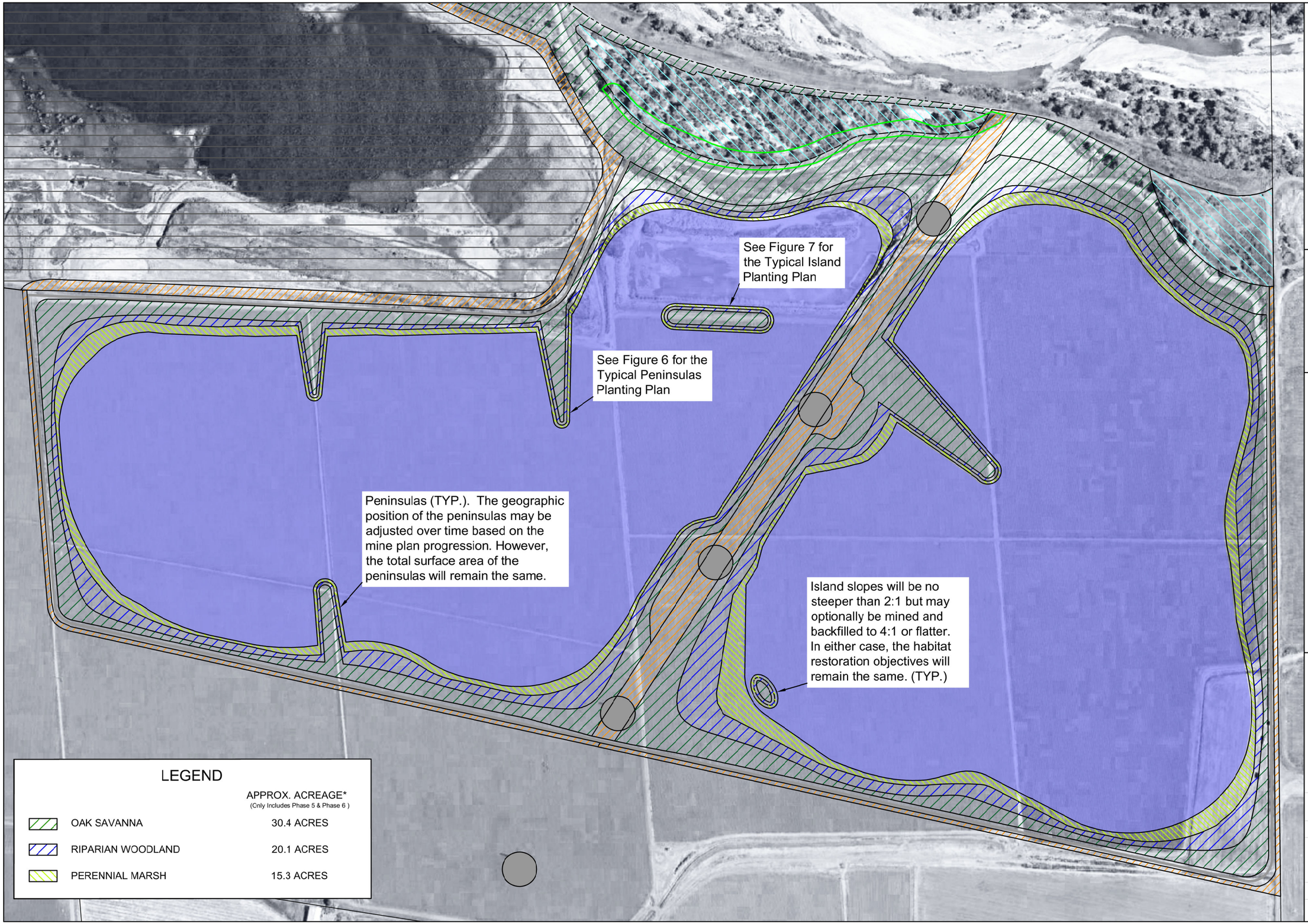

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FIGURE 5
PENINSULAS & ISLANDS CONCEPTUAL PLAN

CEMEX
CACHE CREEK MINE
MADISON, CALIFORNIA

N

0 200' 400'

SOURCE: GOOGLE EARTH 5/20/17
CUNNINGHAM ENGINEERING 10/20/17

PROJECT NO. 1076

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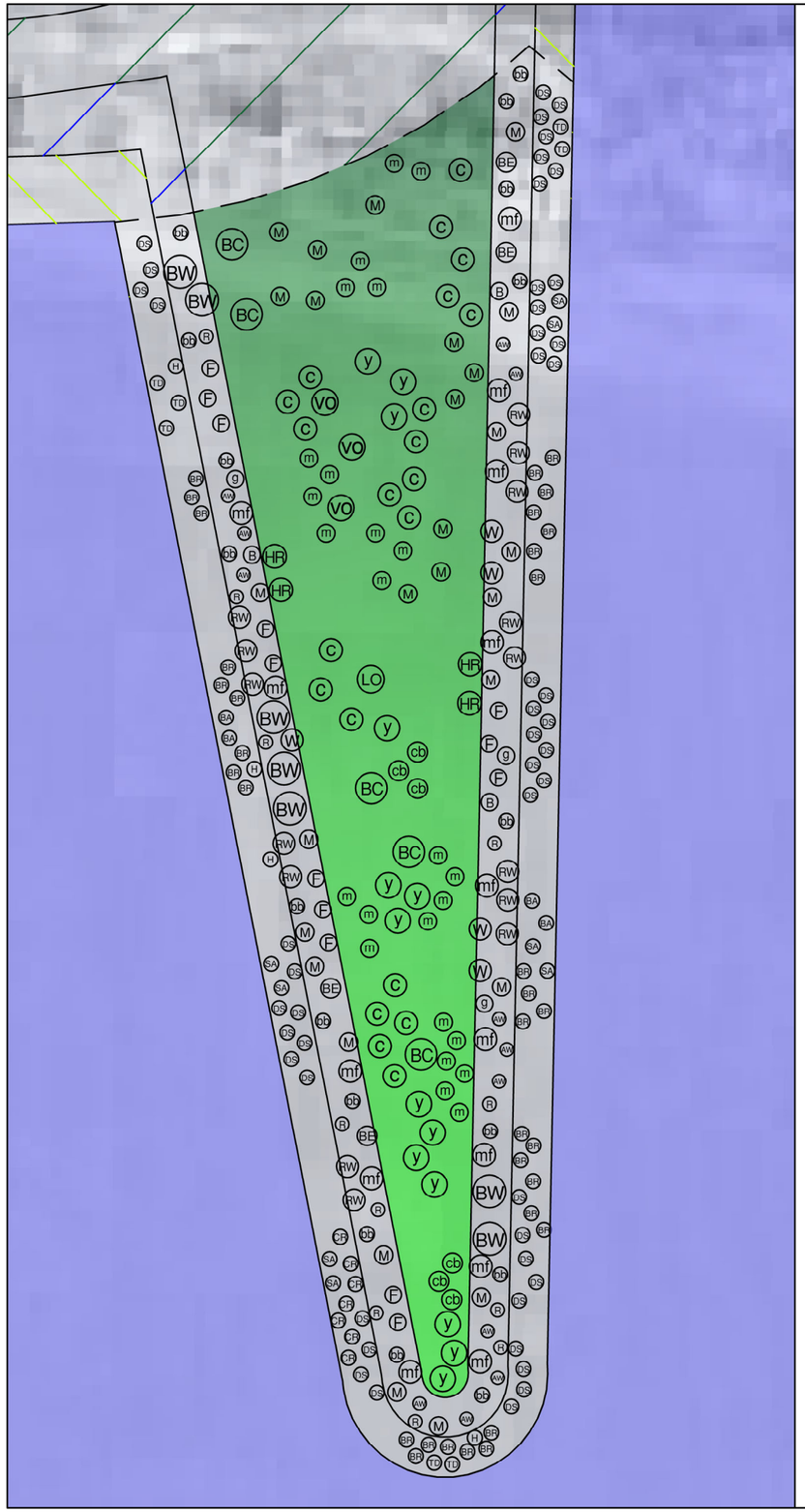
BY: XM

DATE: 9/28/2022



PLANT LEGEND - OAK SAVANNA

SYMBOL	BOTANICAL / COMMON NAME	QTY.
	TREES	
VO	Valley Oak / Quercus lobata	3
BC	Buckeye / Aesculus californica	5
LO	Interior live oak / Quercus wizlensii	1
	SHRUBS	
c	Coyote Bush / Baccharis pilularis	21
y	Yerba Santa / Eriodictyon californicum	14
cb	Coffeeberry / Frangula californica	6
HR	Hollyleaf Redberry / Rhamnus ilicifolia	4
m	Milkweed / Asclepias fascicularis	25
M	Mugwort / Artemesia douglasiana	11
	GROUND COVER	
	Native grassland mix	

PLANT LEGEND - PERENNIAL MARSH

SYMBOL	BOTANICAL / COMMON NAME	QTY.
SA	Bulrush / Schoenoplectus acutus	8
BA	Bulrush / Schoenoplectus americanus	4
TD	Cattail / Typha domingensis	7
BR	Baltic Rush / Juncus balticus	33
CR	Common Rush / Juncus effusus	7
DS	Dense Sedge / Carex densa	48
H	Horsetail / Equisetum hyemale	4

PLANT LEGEND - RIPARIAN WOODLAND

SYMBOL	BOTANICAL / COMMON NAME	QTY.
	TREES	
RW	Red Willow / Salix laevigata	15
AW	Arroyo Willow / Salix lasiolepis	12
BW	Black Willow / Salix gooddingii	7
F	Fremont Cottonwood / Populus fremontii	13
W	N. California Walnut / Juglans hindsii	5
BE	Box Elder / Acer negundo	4
	SHRUBS	
bb	Buttonbush / Cephalanthus occidentalis	17
M	Mugwort / Artemesia douglasiana	16
mf	Mulefat / Baccharis salicifolia	14
R	Calif. Rose / Rosa californica	11
B	Calif. Blackberry / Rubis ursinus	3
g	Wild Grape / Vitis californica	3

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FIGURE 6
TYPICAL PENINSULA PLANTING PLAN

CEMEX
CACHE CREEK MINE
MADISON, CALIFORNIA

N

0 50' 100'

SOURCE: GOOGLE EARTH 5/20/17
CUNNINGHAM ENGINEERING 10/20/17

PROJECT NO. 1076

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BY: XM

DATE: 9/19/2022

from riparian woodland around the perimeter to savannah in its center (**Figure 7**).

The other area, which will be enhanced and restored with riparian woodland will be the riparian depressions. Some of these areas contain good cover by riparian species, however it is made up with just a few species. Therefore, native diversity should be increased. As well, some of these depressions also contain relatively high levels of non-native vegetation including tamarisk (*Tamarix sp.)* and perennial pepperweed (*Lepidium latifolium*). To the extent practicable, these invasive species will be removed and controlled before native vegetation is planted. The Maintenance section of this report contains a detailed weed management program. In order to increase native diversity, a mix of riparian trees, shrubs and wetland vegetation are proposed for these areas.

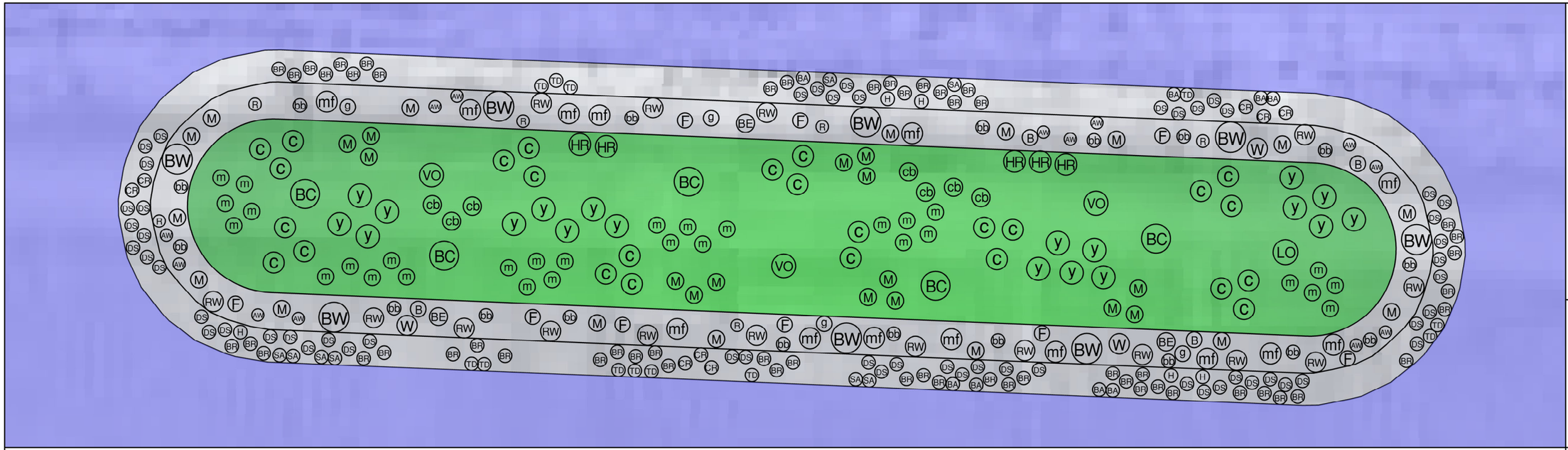
Restoration of the riparian depressions will include enlargement of the watershed that drains into the riparian depressions. Grading within the oak savannah habitat, which surrounds the depressions, will be completed so that a larger area than what currently exists, will drain into the depressions and augment their existing hydrology. The current plan calls for draining as much area as is practicable into these depressions, up to approximately 7 acres. These changes will help simulate flood hydrology during rain events and provide better riparian hydrology to these preserved and enhanced areas.

3. Perennial Marsh

The perennial marsh will be formed between ALW and AHW around the perimeter of the lakes and peninsulas and on the islands (Figures 2 and 3). This habitat will occur at the elevation just below the riparian habitat. As noted above, the proposed grading plan includes scalloping the lake shorelines to produce varied slopes. This will result in areas with wider and narrower bands of perennial marsh, with dominance by different species. The perennial marsh will be planted with deep-rooted, native perennial vegetation such as tule, cattails, and rush.

4. Oak Savannah

The oak savannah habitat will be restored within the 200' Creek setback, around the upland perimeter of the lakes, on the peninsulas and on the interior of the islands (Figures 2, 6 and 7). These areas will be planted with oak savanna species and seeded with native grasses for the savannah understory. The native grass understory is shown in the island planting plan (Figure 7), which also provides a detailed plan of the oak savannah for the island. Valley oak (*Quercus lobata*) and coyote bush (*Baccharis pilularis*) will be dominant woodland species mixed within a perennial grassland understory in the oak savannah habitats. Because



PLANT LEGEND - OAK SAVANNA

SYMBOL	BOTANICAL / COMMON NAME	QTY.
	TREES	
VO	Valley Oak / Quercus lobata	3
BC	Buckeye / Aesculus californica	5
LO	Interior live oak / Quercus wizlensii	1
	SHRUBS	
c	Coyote Bush / Baccharis pilularis	26
y	Yerba Santa / Eriodictyon californicum	19
cb	Coffeeberry / Frangula californica	7
HR	Hollyleaf Redberry / Rhamnus ilicifolia	5
m	Milkweed / Asclepias fascicularis	30
M	Mugwort / Artemesia douglasiana	15
	GROUND COVER	
	Native grassland mix	

PLANT LEGEND - RIPARIAN WOODLAND

SYMBOL	BOTANICAL / COMMON NAME	QTY.
	TREES	
RW	Red Willow / Salix laevigata	16
AW	Arroyo Willow / Salix lasiolepis	13
BW	Black Willow / Salix gooddingii	8
F	Fremont Cottonwood / Populus fremontii	14
W	N. California Walnut / Juglans hindsii	5
BE	Box Elder / Acer negundo	4
	SHRUBS	
bb	Buttonbush / Cephalanthus occidentalis	18
M	Mugwort / Artemesia douglasiana	20
mf	Mulefat / Baccharis salicifolia	18
R	Calif. Rose / Rosa californica	12
B	Calif. Blackberry/Rubis ursinus	5
g	Wild Grape/Vitis californica	5

PLANT LEGEND - PERENNIAL MARSH

SYMBOL	BOTANICAL / COMMON NAME	QTY.
SA	Bulrush / Schoenoplectus acutus	8
BA	Bulrush / Schoenoplectus americanus	8
TD	Cattail / Typha domingensis	12
BR	Baltic Rush / Juncus balticus	56
CR	Common Rush / Juncus effusus	8
DS	Dense Sedge / Carex densa	56
H	Horsetail / Equisetum hyemale	5

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FIGURE 7
TYPICAL ISLAND PLANTING PLAN

CEMEX
CACHE CREEK MINE
MADISON, CALIFORNIA

N

0 40' 80'

SOURCE: GOOGLE EARTH 5/20/17
CUNNINGHAM ENGINEERING 10/20/17

PROJECT NO. 1076

FILE: D:\Graphic Designer\My Documents\PROJECTS\1000-1100\1076 Cache Creek\AutoCAD\1076_Fig 7 Island pltg_220915.dwg

BY: XM

DATE: 9/19/2022

the 200' setback is actively used for mining access and transporting mine materials as the conveyer is located within this zone, this area will not be restored until at or near the end of active mining.

5. Native Grassland Buffer

A native grassland buffer will be restored between the existing and reclaimed agricultural fields and the restored areas including the lakes and oak savannah. (Figure 2). The slopes around these fields will be graded to approximately 2:1 or flatter. Areas that have slopes of 3:1 or flatter will be drill seeded with a mix of native grassland species. Drill seeding with native grasses, which was completed on significant portion of the Phase 2 area and within a portion of the 200' creek buffer, has already proven effective at the site. Areas steeper than 3:1 will be prepared and broadcast seeded with the same mix of native grassland species. A forb and sub-shrub component are included in the grassland habitat as well, which was present within the historical grasslands in the region and provides benefits to local wildlife.

While a small maintenance road will run around the lakes the native grass buffer will be restored between the road and the agricultural fields. A swale will run between the buffer and the fields to capture reclaimed drainage water from the agricultural fields and prevent that water from draining into the lakes.

6. Interstate 505 Screening

As part of earlier phases of the existing Habitat Restoration Plan (Zentner 1995), Interstate 505 screening was initiated (Figure 2). This screening was completed using Fremont cottonwoods (*Populus fremontii*) and was very successful. Over time, however, some gaps have formed along the screen where trees have fallen. Therefore, additional Fremont cottonwood and California walnut trees will be planted to fill in the gaps to restore the screen. A few patches of invasive vegetation including tamarisk (*Tamarix sp.)* and perennial giant reed grass (*Arundo donax*) occur in the northern portion of the screen area. To the extent practicable, these invasive species will be removed and controlled before native vegetation is planted.

7. Bank Swallow Habitat

As part of the Existing Entitlements, the project applicant agreed to restore the bluffs above the large, easterly riparian depression (shown in Figure 2). This riparian depression was found to be suitable habitat for bank swallows with near-vertical bluffs. Bank swallows were noted as having recently begun nesting in these bluffs as of approximately 1997. Therefore, the steep banks associated with this riparian depression will be protected and preserved as is.

C. Planting and Revegetation Methods

1. Technical Supervision

Revegetation activities should be conducted under the supervision of an experienced Ecological Monitor (EM). The EM and Restoration Contractor (RC) will work closely together to assure that revegetation is accomplished according to plans. Any substantial deviation from the revegetation plans will need to be approved by the EM and the County.

2. Experienced Contractor

Only contractors with previous experience in native habitat restoration should be considered for this project. By limiting this work to personnel that have developed a working knowledge of the nuances and complications of native habitat restoration, the risk of failure or damage to existing habitats is significantly reduced. This also allows greater flexibility for making adjustments in the field as is often necessary.

3. Preconstruction Activities

Prior to initiation of plantings, the EM and RC will establish and stake the limits of habitat planting areas. Flagging of the new habitats may involve making minor adjustments from plan locations as dictated by field conditions.

Access routes, staging areas, and similar features will also be located and staked in the field. Where necessary, preconstruction surveys will be conducted and orange construction fencing or similar visible barrier will be installed to delimit sensitive areas adjacent to construction areas (see Biological Resources Update, Zentner Planning and Ecology 2017 for more details).

4. Site Preparation

New habitat and restoration areas will generally be prepared for revegetation as follows:

- Non-native vegetation, trash, debris, and weeds will be cleared.
- Prior to habitat restoration in the riparian depressions, grading within the adjacent Oak Savannah and upland mining areas will be completed in order to enlarge the watersheds for the Riparian depressions as much as practicable. Adding very shallow slopes that drain into the depressions will be completed to augment existing hydrology.

- The shoreline of the Phase 5 and 6 lakes will be scalloped as shown on the Project Reclamation Plan drawings to provide a variety of slopes as well as shallow water habitats.
- Resoiling will occur as necessary, especially within the reclaimed agricultural parcels. Please see Section IV Resoiling, for more detailed information.
- In the case of seeding, grow-kills should be completed as detailed in Section 9c of Chapter V entitled Restoration Planting.

5. Supplemental Irrigation System

Several areas call for the planting of trees and shrubs, which require supplemental irrigation. These areas include the Riparian habitat and the Oak Savannah/Native Grassland. The native trees and shrubs planted will be irrigated through a simple, temporary drip system. Drip irrigation will be supplied for the planted trees and shrubs for up to two years from their initial planting with a gradual tapering in the third year and no irrigation in the fourth and fifth years. No broadcast irrigation will be applied at any time. The species chosen for inclusion in the seed mixes and are intended to be self-sustaining without dependence on long-term irrigation, or ongoing applications of soil amendments or fertilizers.

A planting basin shall be formed around each installed plant to help hold water near these plants, to ensure adequate irrigation. The basin consists of a two-foot diameter water ring two inches deep with a surrounding berm two inches above grade centered on the plant. An emitter will be placed directly on top of the root ball. After installation, the plant will be watered thoroughly. Plants will all be checked for settling and stress within two to three days of installation. All rooted plantings will be watered-in at the time of planting.

Seeded areas rely upon seasonal rainfall for water and, therefore, should not be watered in. This will help ensure that adequate rainfall occurs after seeding and germination. Additional irrigation of the seeded graminoids (grasses) should not occur beyond this initial watering, however, the need for supplemental watering may be deemed necessary if these plants show serious stress due to any prolonged dry spells during monitoring in the first winter/spring after planting.

At the direction of the EM, irrigation may be continued on an as-needed basis during the third year following initial planting to facilitate root development, so that plants will be sufficiently established. However, irrigation should not extend beyond this and will not be required as part of the long-term management.

The amount and frequency of irrigation of each planting area will be determined through monitoring soil moisture conditions and plant vigor during the initial irrigation period. The goal is to provide deep, infrequent watering to encourage deep rooting of all perennial species.

6. Timing and Phasing

Phasing for the restoration work should generally follow the phasing of the Mining and Reclamation Plan. Restoration work on each phase should be initiated in the same season as the reclamation for that phase is complete. Currently, resoiling in the phase 1 area is nearly complete. Therefore, restoration of the native grass slopes may be initiated upon approval of this Plan and based upon the timing described below.

Container and cutting plant materials will be installed between October 1 and February in the same year as reclamation; fall and winter are the optimal periods for planting as many plants are dormant and weather conditions are favorable. Any replacement plantings, if required, will also be installed during the fall or early winter. Seeding (both drill seeding and broadcast seeding) will be conducted between October 1 and November 31 within the same year that a restoration phase has been completed. Specific planting dates will be based on weather conditions and based on guidance by the EM.

The exception will be the Oak Savannah within the 200-foot creek buffer, including the upland surface mining disturbances on the north side of Phases 3 and 4. This area will continue to be actively used for material transport until reclamation is complete. Therefore, this area will be restored after equipment removal (e.g., conveyor removal) has been completed.

IV. RESOILING

Resoiling is the process of artificially building or reconstructing a soil profile. This Section addresses SMARA regulations related to resoiling as codified in the California Code of Regulations (CCR) Section 3500 et. seq. The specifics of these regulations are further detailed in CEMEX's Revised Reclamation Plan.

Resoiling will occur in mined areas south of the 200-foot Creek buffer. The majority of the resoiling will take place primarily to return mined areas back to agriculture production. As shown in the Reclamation Plan and in Figure 2, Phases 1 through 4 are slated to be reclaimed to agriculture, while Phases 5 and 6 will not require substantial resoiling (except limited resoiling around the perimeter of the lake on mining cut slopes) as they will remain as lakes. Some resoiling will also occur in the buffer areas around the reclaimed agricultural fields and the mined lakes. At the County's request, CEMEX has proposed to eliminated Phase 7 from the project.

Growth media for revegetation will consist of native topsoil and overburden. The average thickness of overburden and topsoil replaced on the site during reclamation will vary depending on the reclamation use of an area. Where salvaged topsoil and growth media cannot be used immediately, topsoil (A horizon) and other growth media (e.g., B and C horizon) will be stockpiled separately and will not be disturbed until needed for reclamation. Stockpiles will be properly identified to help ensure topsoil and other growth media are not mistakenly blended. Soil stockpiles will have maximum heights of 40 feet and maximum side slopes of 2:1 (horizontal:vertical). These stockpiles will be seeded with an appropriate seed mixture as needed to prevent water and wind erosion and to discourage the growth of weeds.

Prior to revegetation, the operator will generally handle soils and prepare a revegetation substrate in the following manner:

1. Remove soils only as necessary to access new mining areas and use them for reclamation as soon as it can be accommodated by the mining schedule.
2. To the extent practicable, limit topsoil and vegetation removal to within one-year of fill placement, unless a longer time period is administratively approved by the County.
3. Where possible, place soils that have been removed for direct use in reclamation. Where salvage topsoil cannot be used immediately for reclamation, stockpile it separately from other overburden and do not disturb the soils until needed for reclamation.
4. Prior to resoiling, rip, disc and/or scarify fill areas as needed to relieve compaction and rills, ruderal vegetation, or other surface irregularities.

5. Distribute topsoil in preparation for revegetation, with a target thickness of 12-inches of topsoil atop overburden and/or other native substrate materials.
    a. The thickness of topsoil salvaged and redistributed on the site during reclamation will vary. The target thickness of 12-inches is only a guideline based on available site-specific soil information.
    b. Where prime agricultural reclamation is intended, and distinct soil horizons are distinguishable, then the sequence of horizons will have the A atop the B, the B atop the C, and the C atop the graded surface.
6. Following resoiling, where soil has been compacted, till or scarify the ground surface to create a favorable seedbed.

Soil amendments, if required during revegetation efforts, should be applied according to manufacturer's specifications.

V. RESTORATION PLANTING

A. Riparian Woodland

Riparian woodland will be planted around the perimeter of the lakes and peninsulas in Phases 5 and 6, around the islands, and within the riparian depressions that are located within the geographic limits of the 200-foot Creek buffer[1]. Within the lake and island elements, riparian woodland will be planted on the slopes buffering the lake starting at or just inside of average high water (AHW). This riparian habitat will slowly transition to oak savannah and native grassland. The result will be a complete system of grasslands and woodlands that will provide native diversity and cover for wildlife foraging and movement.

The riparian depressions will also be planted with riparian woodland. The surrounding slopes within the oak savannah and upland mining areas between Phases 3 and 4 and the riparian depressions will be graded such that they drain into these areas and help support the riparian hydrology of these depressional habitats. Invasive vegetation including tamarisk will be removed and treated with an herbicide prior to revegetation work.

The plant list for the riparian woodland habitat is detailed in **Table 1.** Figure 3 provides a cross-section of these areas. The island details and planting plan are provided in Figures 5 and 7 and the peninsula detail and planting plan are provided in Figures 5 and 6 respectively. The planting plans in Figures 6 and 7 are derived from the plant lists provided in **Tables 1 and 3**.

Table 1

Riparian Woodland Plant List

Common Name	Scientific Name	Size	# per Acre
TREES			
red willow	*Salix laevigata*	tree pot	32
arroyo willow	*Salix lasiolepis*	tree pot	25
black willow	*Salix gooddingii*	tree pot	15

[1] Note: The riparian depressions are excluded from the calculation of the 200-foot creek buffer. Therefore, where the riparian depressions are present, the actual measured distance between the creek bank and the top of the mining slopes is greater than 200 feet.

Common Name	Scientific Name	Size	# per Acre
Fremont cottonwood	*Populus fremontii*	tree pot	27
N. California walnut	*Juglans hindsii*	tree pot	10
boxelder	*Acer negundo*	tree pot	8
SHRUBS			
buttonbush	*Cephalanthus occidentalis*	1 gal	35
mugwort	*Artemesia douglasiana*	1 gal	40
mulefat	*Baccharis salicifolia*	1 gal	35
Calif. rose	*Rosa californica*	1 gal	23
Calif. blackberry	*Rubis ursinus*	1 gal	10
wild grape	*Vitis californica*	1 gal	10
		TOTAL	**270**
GRASSES			
creeping wildrye	*Elymus triticoides*	Plug	800

B. Perennial Marsh

Native perennial marsh vegetation will be planted around the Phase 5 and 6 lakes. This habitat most naturally occurs between average high water (AHW) and average low water (ALW), which is the zone where planting will take place. Vegetation will consist of relatively deep-rooted perennials that are adapted to perennially wet conditions. This vegetation will transition naturally to riparian woodland.

The plant list for the perennial marsh is detailed in **Table 2**. Figure 3 provides an illustrative cross-section of this and other habitats.

Table 2

Perennial Marsh Plant List

Common Name	Scientific Name	Size	# per Acre
bulrush	*Schoenoplectus acutus*	tree band	15

Common Name	Scientific Name	Size	# per Acre
bulrush	*Schoenoplectus americanus*	tree band	15
cattail	*Typha domingensis*	tree band	20
Baltic rush	*Juncus balticus*	rose-pot	100
common rush	*Juncus effuses*	tree band	15
dense sedge	*Carex densa*	rose-pot	100
horsetail	*Equisetum hyemale*	1 gal	10
		TOTAL	**275**

C. Oak Savannah and Native Grassland

The oak savannah habitat will be restored within the 200-foot buffer between Cache Creek and the mined areas. This habitat will contain relatively sparse trees with denser shrubs and a native grassland understory. This habitat better approximates the vegetation that existed in this zone prior to habitat conversion. As well, this vegetation is better adapted to the soils in this zone. The soils in this area are generally well-drained but contain pockets of more and less well drained soils. The planting pallet below allows for planting appropriate vegetation based upon soil micro-habitats as well as native grassland that is adapted to all of these soils.

This vegetation will also be planted in the upper banks around the Phase 5 and 6 lakes above the riparian Woodland vegetation and just up to the top of bank. Oak Savannah and native grassland understory vegetation will also be planted within the interior portion of the island, in an elevation just above the riparian woodland. In both instances, the riparian woodland vegetation will transition to the oak savannah and native grassland vegetation.

The tree and shrub plant list for the oak savannah is detailed in **Table 3**, while the grassland component is detailed in **Table 4**. Figure 3 provides an illustrative cross-section. Figure 6 provides the peninsula's detailed planting plan and Figure 7 provides the island's, which follows from the vegetation details provides in **Tables 1 and 3**.

Table 3

Oak Savannah/Native Grassland Plant List

Common Name	Scientific Name	Size	# per Acre
TREES			
valley oak	*Quercus lobata*	tree pot	5
buckeye	*Aesculus californica*	tree pot	7
interior live oak	*Quercus wizlensii*	tree pot	2
SHRUBS			
coyote bush	*Baccharis pilularis*	1 gal	39
yerba santa	*Eriodictyon californicum*	1 gal	28
coffeeberry	*Frangula californica*	1 gal	11
hollyleaf redberry	*Rhamnus ilicifolia*	1 gal	8
		TOTAL	**100**
GRASSES			
See Native Grassland Plant List **(Table 4)** below			

D. Native Grassland Buffer

The Native Grassland Buffer habitat restoration will be located in areas that abut the restored habitats including the lakes and the oak savannah. (Figure 2). This habitat is meant to provide both a buffer from agricultural land uses and as a habitat transition to the restored habitats. As such, this habitat will be dominated by grasses and forbs. The restoration will occur by drill-seed in areas 3:1 or flatter and broadcast seeding in other instances at the rates provided in **Table 4** below. Rose-pots will generally be planted in clusters of between five to seven plants at the rates indicated in Table 5.

The plant list for the native grassland buffer is detailed in **Table 4**. Figure 3 provides an illustrative detail for this habitat.

Table 4

Native Grassland Buffer Plant List

Common Name	Scientific Name	Size	# per Acre
creeping wild rye	*Elymus triticoides*	seed	9
slender wheatgrass	*Elymus trachycaulus*	Seed	7
purple needlegrass	*Stipa pulchra*	seed	6
blue wildrye	*Elymus glaucus*	seed	8
six-weeks fescue	*Festuca microstachys*	seed	2.5
meadow barley	*Hordeum brachyantherum*	seed	4
yarrow	*Achillea millefolium*	seed	2.5
California poppy	*Eschscholzia californica*	seed	3
sky lupine	*Lupinus nanus*	seed	3.5
gumplant	*Grindelia camporum*	seed	3
		TOTAL	**48.5 lbs/ Acre**
milkweed	*Asclepias fascicularis*	rose pot	45
mugwort	*Artemesia douglasiana*	rose pot	15
		TOTAL	**60**

Note: Composition of seed mix (and appropriate modifications) to be determined based on availability from suppliers, test plot results (if applicable) and species determined most suitable at the time planting occurs.

For the above habitats, grass and grass-like plug plantings will be placed on one-foot centers. Trees and shrubs will be placed in clusters of approximately 3-5 plants except within the oak savannah, where trees will be relatively widely spread over the habitat.

The native grassland seed mix in **Table 4** may also be used for temporarily disturbed areas outside of these planned restoration areas as needed. Alternatively, a native erosion control seed mix may be used for temporary disturbances (see, e.g., Table 13).

E. Interstate 505 Screening

Fremont cottonwoods will be planted to fill in the gaps of the existing cottonwoods that make up the Interstate screening. A total of 40 of these will be used to fill in these areas. In addition, a small portion of the screen closest to Cache Creek will be planted with California walnut, as these have been successful in this portion of the project area, and they will integrate into those that already exist in this area. The plant list is provided in **Table 5**.

A relatively small amount of invasive vegetation including tamarisk and giant reed grass, is currently found within the northern end of the screening area. These plants will be removed and treated with an herbicide prior to revegetation work.

Table 5

Interstate 505 Screening Plant List

Common Name	Scientific Name	Size	Number
TREES			
Fremont cottonwood	*Populus fremontii*	tree pot	40
California walnut	*Juglans hindsii*	tree pot	15

F. Bank Swallow Habitat

No planting measures are necessary for this habitat as more open areas are preferred for nesting by bank swallow. However, the southern edge of the habitat, which contains the near-vertical bluffs should be protected with orange construction fencing to ensure that grading does not get to close to the edge or that soil materials are not accidentally pushed over the edge of the habitat and impact the steep banks. This fencing will be erected prior to work commencing within 50 feet of the area and may be removed after work is completed.

G. Planting Techniques

Trees and shrubs will be planted in clusters within their respective habitats. These clusters will vary based on proximity to water, slope, exposure and other factors. The plant contractor shall work with the EM to ensure proper placement of plantings.

1. Plugs

The following specifications will be employed for installing the plugs:

- Planting holes shall be slightly deeper than the plug, by about ¼" to provide for additional soil on top of the plug surface. This will prevent excessive transpiration after planting.
- Roots will be protected from the sun and/or drying winds.
- After plants are removed from the plug trays, the root ball will be bent and slightly twisted to free the roots from the tray form.
- Plants will be set in planting holes so that the crown of the root ball is just below the ultimate soil surface (i.e., finished grade).
- Finely broken-up backfill will be tamped firmly on top of the plug.
- Immediately following installation, plug planting areas will be watered in with sufficient water to reach the lower roots.

2. Shrubs

The following specifications will be employed for installing the shrubs:

- Planting holes will have vertical sides with roughened surfaces. Each planting hole will be partially backfilled with soil excavated from the planting hole.
- Roots will be adequately protected from the sun and/or drying winds.
- After plants are removed from containers, the sides of the root ball will be scarified to promote development of new roots. Any roots wrapped around the sides of the container will be pulled loose from the root ball.
- Plants will be planted with the roots untangled, and spread out in the planting hole to promote even root penetration.
- Plants will be set in planting holes so that the crown of the root ball is at or just above the ultimate soil surface (i.e., finished grade).
- Finely broken-up backfill will be tamped firmly around the root ball, making certain not to depress the crown of the plant.
- The top of the root collar shall be exposed rather than covered with soil; however, the sides of the root ball will not be exposed.
- Immediately following installation, each plant will be deep soaked with sufficient water to reach the lower roots.

3. Seed Installation Technique

Seeding will take place in October or November using the current weather forecast in order to provide the most optimal time as practicable in regards to early season rainfall.

Prior to seeding grow-kill cycles will be used in order to remove non-native and invasive weeds. A grow-kill cycle involves irrigating the soil (or using natural rainfall), allowing the existing seedbank to germinate, followed by removing the vegetation using a chemical, post-emergent herbicide treatment. The cycles will be conducted a sufficient number of times to remove the majority of the weed species present in the seed bank, but a minimum of at least one grow-kill cycle will be completed for any seeded area. If rainfall is to occur early enough in the year, this could be completed, in part, through early season rainfall. Otherwise, supplemental water from a water truck or other source should be used.

Before seeding, all debris will be removed from the area to be seeded. If the soil has been compacted, the ground surface will be tilled to a minimum 12-inch depth if practicable but at least scarified to 3 inches in depth to create an adequate seed bed for planting. Seed will be sown via broadcast seeding or drill seeding and then raked in and watered.

H. Plant Protection

Shrubs may be subject to herbivory that could result in damage or loss of plants. Based on the recommendation of the EM, any or all of the following corrective measures may be implemented during plant installation, if it is determined that plants may be jeopardized by wildlife:

- Plants susceptible to browsing will be protected using wire cages, tree shelters (e.g., hardware wire cages, etc.), or exclosure fencing (e.g., temporary rabbit fences).
- Wire screening will be installed around the roots of plants to prevent damage attributed to subterranean herbivores (e.g., gophers).
- Protective devices will be maintained in place for at least three years, or until herbivory is no longer a threat to the survival of the plants.
- During annual monitoring visits, the EM will observe for evidence of browsing and direct implementation of the measures outlined above as appropriate.

VI. PERFORMANCE STANDARDS

This Plan proposes to restore habitats that feature California native vegetation and wildlife diversity. The success of achieving these goals will be determined by comparing the mitigation habitats with the performance standards established for each habitat type. The success of the restored areas will be evaluated over a three to five-year period after construction they have been restored and at least two years after any replacement of any failed plantings.

A. Proposed Mitigation Performance Standards

The performance criteria, provided in **Tables 6, 7, and 8**, will be used to determine successful completion of restoration responsibilities. Fulfillment of these criteria will indicate that the restoration areas are progressing well toward the habitat characteristics, functions, and values that fulfill the long-term goals of this Plan. The restored habitats will be monitored annually and performance standards should be met by between the third and fifth year of monitoring.

Vegetation monitoring of the marsh, grassland, and understory (non-trees and shrubs) will be conducted in the same fashion for all of the habitat types, using permanent 1 square meter (approx. 10' x 10') plots.

1. Perennial Marsh

The perennial marsh will be planted in the zone between AHW and ALW, which will ensure ponding throughout the year and lead to high cover by native perennials. These two factors are the most significant with regards to the functional analysis: both contribute strongly to water storage, nutrient, pollutant and sediment transformation/sequestration as well as the maintenance of native plant and wildlife communities. As well, high perennial cover should help reduce the potential for invasive, non-native species to establish. **Table 6** details the performance criteria.

Table 6

Perennial Marsh Performance Criteria

Habitat Element	Final Performance Criteria
Vegetation Cover	≥60% per plot avg
Relative hydrophyte Cover	≥60% per plot avg

Relative cover of Native Species	≥60% per plot avg
Average number of Native Species (Species Richness)	≥3 native species per plot avg
Invasive cover	<10%

2. Riparian Woodland and Oak Savannah

Though the Riparian Woodland habitat is quite different from the Oak Savannah the performance standards relating to the health and survivorship of the woodland plantings is the top priority as is reflected in **Table 7**. All of these areas will serve as high quality habitat and movement corridors for wildlife.

Table 7

Riparian Woodland and Oak Savannah

Performance Criteria

Habitat Element	Final Performance Criteria
Woodlands	
Average Number of Native Trees	70% of target density *
Height of Trees	≥6′
Shrubs	
Number of Shrubs	70% of target density *
Height of Shrubs	≥2′

* Performance criteria can be met via planted materials or recruitment of native species or a combination of both

3. Native Grassland Buffer and Savannah Understory

The species composition of native grasslands and the understories of woodland and savannahs are quite similar with minor differences relating to the effects of woody vegetation on soil and shading, which tend to evolve over time. The perennial grassland cover in these areas provides cover and habitat for wildlife while filling space that would otherwise be filled with non-native or invasive vegetation. Overall cover in these areas should be relatively high with a base of native grasses and forbs (wildflowers) and other vegetation, which is what the performance standards provided in **Table 8**, will measure.

Table 8

Native Grassland Buffer and Savannah Understory

Performance Criteria

Habitat Element	Final Performance Criteria
Native Grassland	
Vegetation Cover (Across all stratums)	≥60% per plot avg
Average Number of Natives (Across all stratums) (Species Richness)	≥3 native species per plot avg
Relative Cover of Natives (Across all stratums)	≥30% per plot avg
Invasive cover (Across all stratums)	<10% per plot avg

VII. MONITORING AND REPORTING

A. Post-Construction Monitoring

After completion of any portion of Restoration construction, usually after the reclamation of each Phase, all the elements discussed below will be monitored for a minimum of three years or until the performance standards are met for at least two consecutive years. Monitoring results, including photographs, will be submitted as an annual report to the County by November 1 of each monitoring year.

B. Monitoring Frequency and Season(s)

Generally, Project monitoring will be completed annually. However, qualitative hydrology monitoring of the riparian depressions will be completed up to three times during the first rainy season after the oak savannahs are graded to provide a larger watershed for the depressions. This will help ensure that the riparian areas are receiving a proper water supply. Vegetation monitoring will be completed in the spring or early summer when plant growth and blooming periods are high. Specific monitoring activities shall occur at the frequency and season(s) indicated in **Table 9**. Also, see the maintenance description above for additional detail site reviews focused on weed control.

Table 9

Monitoring Frequency & Seasons

Category	Frequency and Seasons
Hydrology	Up to 3x in the rainy season after completion of wetland depressions and Phases 5 and 6; then yearly
Vegetation	Annually, in late spring or early summer
Maintenance activities	As completed

C. Monitoring Methods

Performance monitoring will include both qualitative and quantitative assessment. Qualitative monitoring will occur during periodic inspections of the restoration areas. These inspections will occur frequently the first few months of

some restoration phases and annually in subsequent years as noted above. Quantitative monitoring will take place annually until the final performance criteria are met and will typically occur annually in the late spring or early summer beginning the first year after planting.

1. Qualitative Monitoring

Qualitative monitoring methods will include visual observation and photo documentation from set stations. There are no specific performance criteria associated with this monitoring.

a. Visual Observation

During monitoring events, the EM will document the condition of the restoration area based on visual observations. Current conditions, potential problems (i.e., vandalism, fence damage, presence of exotic plant species, herbivory, etc.), and any recommended actions will be documented in a Field Memo that will be provided to the operator. Any recommended actions will also be documented in the annual Monitoring Report for that year.

b. Photo Documentation

Annual photographs, which are taken to qualitatively document the progress of the habitat restoration over time, will be taken from preset photo stations during scheduled quantitative data collection events. Additional photographs will be taken of any potential problem areas. All photographs will be logged and representative photos included in each annual report.

c. Hydrology

After grading in the oak savannah has been completed, the hydrology of the riparian depressions will be qualitatively assessed. The amount of soil saturation or the depth of recent ponding will be noted. Rainfall will be tabulated during the rainy season from a local source and the depth and extent of ponding defined will be compared to rainfall and the assessed depth.

2. Quantitative Monitoring

a. Marsh and Grassland Vegetation

Vegetation monitoring will be conducted in the same fashion for the perennial marsh and all of the grassland and understory areas. Permanent square meter (approx. 10' x 10') plots will be randomly established throughout each habitat. Enough plots will be placed within each habitat in order to obtain an adequate sample of each. At a minimum, the total number of plots within each habitat will equal at least 10% of the total acreage (i.e. a 50-acre habitat would require a minimum of 5 plots).

The percent cover of unvegetated ground and of each species will be recorded from these plots in the late spring or early summer of each year during the monitoring period (beginning at the end of the first growing season), using Braun-Blanquet cover classes. Other data will then be calculated from the cover data for each plot, using the mid-point of the range for each code (**Table 10**, below).

Table 10

Braun-Blanquet Cover Classes

Percent Cover	Braun-Blanquet Code	Value Used for Calculations
75-100%	5	87.5%
50-75%	4	62.5%
25-50%	3	37.5%
5-25%	2	15%
many-5%	1	2.5%
Few	+	.1%
one individual	r	.01%

Plants will also be categorized as either "wetland species" or other species. Indicator status will be based on the most current National Wetland Plant List for this region. For comparison to performance criteria, values for all stands within a habitat type will also be averaged. Formulas are described in **Table 11**, below.

Table 11

Vegetation Cover Calculations

Cover Calculation	Formula
Total Species Cover (totals can exceed 100 with shading or 'overlap' between species.)	Sum of cover for all species.
Vegetation Cover	100 minus non-plant cover
Relative Cover by Native Species	Sum of cover for the native species / Total Species Cover.
Relative Cover of Hydrophytes	Sum of cover for the wetland species /Total Species Cover.

b. Woodland Vegetation

All planted trees and shrubs will be checked annually in the spring or early summer for height and health. All trees and shrubs will be placed in one of the height categories in **Table 12**.

Table 12

Tree and Shrub Height Categories

	Class 1	Class 2	Class 3
Trees	<2′	2-6′	>6′
Shrubs	<1′	1-2′	>2′

Each tree and shrub will also be identified as healthy or unhealthy, based on general appearance. Data will be displayed in the annual report by species, including live, dead, and unhealthy plants.

c. Maintenance Activities

All maintenance activities will be reported in the annual monitoring report, including the date and a short description of the work involved. Maintenance activities to be reported include mowing, herbicide use, replacement of dead or

unhealthy shrubs, replacement of plantings, major debris removal and irrigation line repair.

D. Annual Reports

As required by the OCSMO Section 10-4.701, monitoring reports will be submitted annually beginning the first year after construction and continuing until the project meets the performance standards. Reports will include both raw data (as appendices) and summary tables and graphs of the data required to assess project progress. These reports will be due by the 1st of November of each year. In addition to evaluating the progress relative to the performance standards quantitatively and qualitatively, the reports will include representative photographs taken each year from permanent photo stations. The reports will include a list of names, titles, and companies of all persons who prepared the reports and who participated in the monitoring.

VIII. TEST PLOTS

Beginning in 2018 or upon County adoption of this Plan, disturbed mining slopes (in Phase 3) and agricultural backfill areas (in Phase 1) that have reached their final configuration and will not be further disturbed will serve as test plots for the respective revegetation seed mixes. If a portion of the Phase 4 area is seeded with the erosion control mix, test plots will be set up in this area as a substitute for one of the above areas.

The test plots will be used to study the success of the prescribed native grassland and erosion control mixes. The native grassland mix is provided in **Section V, Table 4**. The erosion control mix is provided below in **Table 13**. At least two plots of each mix will be tested, with at least 1 plot in each of the areas described above. In addition, at least one plot in each area, which will remain unseeded, will be used as a control.

Table 13

Native Erosion Control

Broadcast Seed Specification

Common Name	Scientific Name	Size	lbs/acre
blue wildrye	Elymus glaucus	seed	6
California brome	Bromus carinatus	seed	6
meadow barley	Hordeum brachyantherum	seed	5
six-weeks fescue	Festuca microstachys	seed	3.5
California poppy	Eschscholzia californica	seed	2.5
		TOTAL	**23**

The test plots, which will be 100m2 in size, will be monitored during the late spring at a time that best corresponds to identification of the majority of the species. The plots will be surveyed by biologist experienced in the identification and ecology of these species. Data that is to be collected during the surveys of each plot will include:

- A list of all species found within the plot
- Total cover
- Total native cover
- Total non-native cover
- Total invasive plant cover using the species from **Section IX Table 14**
- Total relative cover of each of the species within the prescribed grassland and erosion control mixes.

The test plots will be monitored over the course of two consecutive years after seeding. The results of the test plot monitoring will be used to update planting procedures, species, and success criteria monitoring as necessary in consultation with the County.

IX. WEED CONTROL PLAN

This section describes the weed maintenance activities that the operator will implement on the restoration site during the time period between initiation of the restoration and once reclamation has been completed and all phases have met their performance standards.

A. Control of Weeds and Exotic Plants

Weed control is likely to be the foremost issue for maintenance. **Table 14** shows the invasive species found on or near the mitigation site or likely to occur. These are arranged by their California Invasive Plant Council (IPC) class (Cal-IPC 2020). An explanation of the IPC ratings is provided below the table.

The current version of this Plan was updated with the any species ranked high by the Cache Creek Resources Management Plan (CCRMP) Priority list (2002). These species included Himalayan blackberry (*Rubus armeniacus*) and poison hemlock (*Conium maculatum*), both of which are found in limited distribution on the site. Tree of heaven (*Alianthus altissima*) was also added, though this species is not known from the site.

In addition, any relevant species from the 2020 and 2021 Cache Creek Annual Status Report (Cache Creek TAC 2021 and 2022) were also included. Table 5-2 of the 2020 Status Report summarizes the non-native species of note by reach. The bulk of the site is within the Guesisosi Reach with a smaller portion in the Dunnigan Hills Reach and a fraction within the Madison Reach. Purple loosestrife, which was noted in both the Guesisosi Reach and the Dunnigan Hills Reach was added to the list, though it is also currently found in limited distribution on the site.

Table 14

Invasive Plant Species On-Site

Species		**IPC Rating**	**CCRMP Priority**	**Frequency of Occurrence**
Common Name	**Botanical Name**			
ravennagrass	*Saccharum ravennae*	**Moderate/ Alert**	**High**	Sparse
giant reed grass	*Arundo donax*	**High**	**High**	Limited distribution
stinkwort	*Dittrichia graveolens*	**Moderate/ Alert**	Low	Co-Dominant

tamarisk	*Tamarix sp.*	**High**	**High**	Limited distribution
perennial pepperweed	*Lepidium latifolium*	**High**	**High**	Limited distribution
yellow starthistle	*Centaurea solstitialis*	**High**	**High**	Co-Dominant on creek slopes
tree tobacco	*Nicotiana glauca*	Moderate	**High**	Co-Dominant near creek
smilo grass	*Stipa miliacea var. miliacea*	Limited	NA	Limited distribution
Russian thistle	*Salsola tragus*	Limited	NA	Limited distribution
white horehound	*Marrubium vulgare*	Limited	NA	Sparse
bull thistle	*Cirsium vulgare*	Moderate	**High**	Co-Dominant
Italian thistle	*Carduus pycnocephalus*	Moderate	**High**	Abundant
milk thistle	*Silybum marianum*	Limited	**High**	Co-Dominant
summer mustard	*Hirschfeldia incana*	Moderate	NA	Co-Dominant
Himalayan blackberry	*Rubus armeniacus*	**High**	**High**	Limited distribution
tree of heaven	*Ailanthus altissima*	Moderate	**High**	Not currently present
poison hemlock	*Conium maculatum*	Moderate	**High**	Limited distribution
purple loosestrife	*Lythrum sp.*	**High**	Medium	Limited distribution

IPC RATINGS KEY

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Alert – An Alert is listed on species with High or Moderate impacts that have limited distribution in California, but may have the potential to spread much further.

Watch – These species have been assessed as posing a high risk of becoming invasive in the future in California.

(IPC 2017)

Maintenance work will be conducted to reduce the cover of species rated High or Alert by the IPC. Reductions in these aggressive weeds, which outcompete native plant species for resources (e.g. space, water, nutrients, and light), will help the restoration work meet the required performance standards. However, complete eradication may not be feasible unless the weed-infested patches are small.

Once sprouted, these invasive weeds should be removed mechanically to the maximum extent practicable through hand-pulling, mowing, and similar strategies. If mechanical control is not effective or practicable, an EPA-approved systemic herbicide may be applied. Herbicides will be applied under the direction of a licensed applicator and shall be consistent with protection of wildlife potentially occurring on-site, e.g. VELB, Bank swallow, Bat species, Swainson's hawk. More specific recommendations for each of these plant species is provided below.

Ravennagrass/hardy pampas grass (*Saccharum ravennae*): Ravennagrass is an extremely large (up to approximately 12 feet) perennial grass with dense, purplish-colored plumes.

This plant is found sparsely along the channel and channel banks of Cache Creek where it is known to be spreading. When observed, pampas should be spot sprayed with a broad spectrum herbicide. Larger plants will likely require repeated treatments to be effective. Given the limited spread and distribution, new invaders along the edge of Cache Creek should be relatively easy to control.

Giant reed grass (*Arundo donax*): Giant reed grass is also an extremely tall (up to 20 feet) grass with relatively short wide leaves and tall, white plumes. This species is found sporadically along the banks of Cache Creek and in the high terrace zone. Once established, this plant forms dense, impenetrable stands.

Stands should be cut to near ground level before using a broad spectrum herbicide, which may be painted on the stems. Early identification and eradication of establishing grasses greatly simplifies control. Given the limited spread and distribution, new invaders along the edge of Cache Creek should be relatively easy to control.

Stinkwort (*Dittrichia graveolens*): Stinkwort is an annual sticky, glandular plant with a pungent odor. It normally grows between 1 to 3 feet high, though it can get up to as much as 6 feet tall. It has small yellow flowers that produce large amounts of seed that are carried by the wind.

Stinkwort is a plant species that is spreading relatively rapidly throughout the region. Treatment of these plants should be completed prior to flowing and seed development. Prior to maturation, the plant is easy to remove and control. At early stages well before flowering, the plant can be removed using weed whips. When flowering or close to flowering, all cut plant material should be bagged and properly disposed of as seed can continue to mature after the plant has been cut and this species is highly successful at spreading through relatively disturbed areas through seeding. Given the ongoing disturbances at the site and the relatively high level of wind that the area experiences, this plant has a high potential to spread. Once spread, the plant will be very difficult to control. Therefore, this species should be subject to ongoing control measures during plant operation and reclamation.

Tamarisk (*Tamarix sp.):* This species is being found more often in the lower banks of cache creek and is also present in the riparian depressions, especially the largest one near the eastern border. This plant is a known invader of riparian areas and should be treated when found on the slopes of Cache Creek. Those that are found within the habitat depressions do not pose a risk to the remainder of the site as they are very unlikely to spread out of those areas. Tamarisk in these depressions should be removed and treated during the restoration process of these areas.

Perennial pepperweed (*Lepidium latifolium*): Perennial pepperweed was observed primarily around the shop and the roadside to the shop. This plant spreads quickly in mesic areas. Currently, the amount of area this plant takes up is relatively small and therefore, should be treated before it can spread and while it is comparatively easy to control. A broad-leaf herbicide should be used to treat this species.

Yellow starthistle (*Centaurea solstitialis*): This species is widespread throughout the site. However, it has been successfully treated in a number of areas during

reclamation and restoration. The westernmost portion of the Phase 1 area was completely dominated by yellow starthistle for a number of years. However, the site was successfully restored by discing the field and applying herbicide treatment prior to drill seeding. Therefore, given this success and the already widespread nature of the plant on the site, it should be dealt with during the reclamation and restoration process of each phase and once at final reclamation.

Himalayan blackberry: This species is found in limited distribution, primarily along the Cache Creek bank near the Madison Reach. This thorny, perennial plant is a difficult species to control even with the use of chemicals. Experience has shown that mowing back to the roots and then treating with a reduced application rate of broad spectrum herbicide on the plant regrowth works with repeated doses over time.

Purple loosestrife: This species is usually found as individuals along the edges of perennial waters or riparian areas. Purple loosestrife spreads primarily by seed, but also by root and stem fragments. This species was noted within both the Guesisosi and Dunnigan Hills reaches of Cache Creek on the south bank, which includes the site. Individuals of these species should be cut and spot sprayed with a broad spectrum herbicide before going to seed.

Besides these plants, which have the potential to become invasive on the site, there are a number of other weeds, primarily mustards and thistles that are known on the site. While these weeds can dominate locally disturbed areas, they are unlikely to become invasive outside of these areas. Treatment without replacement does little good with these weeds. There are areas that have been dominated by these weeds for many years, but have not moved off of these sites. Control by burning or herbicides provides short term relief, but does little good in the long term. These areas including both vegetation and soils are best left undisturbed and should be dealt with during the reclamation and restoration process of each phase and once at final reclamation. When ready, the top 12 inches or so of soil should be removed and buried to a depth of at least 5 feet so as to kill off the seed bank.

These species include:

Smilo grass (*Stipa miliacea var. miliacea*): This species is very localized in a few locations around the banks of Cache Creek and is not spreading rapidly. Given its limited distribution and ability to spread, it should be dealt with during the reclamation and restoration process of each phase and in the final condition.

Russian thistle (*Salsola tragus*): Outside of a few individuals, this species is noted almost exclusively from the disturbed northeastern portion. This outbreak should be controlled while it is relatively small and easier to manage. Adult

individuals should be cut and removed. Seedlings can be sprayed with a post emergent, or cut at the base with hand tools or weed whips.

White horehound (*Marrubium vulgare*): A very few individuals of this species were noted sporadically around the site. It does not appear to be a large danger of spreading

Tree tobacco (*Nicotiana glauca*): Tree tobacco has been found occasionally along and near the banks of cache creek and in some of the gravel piles near the plant. In the past, these have been successfully treated with herbicide during restoration.

Bull thistle (*Cirsium vulgare*), **Italian thistle** (*Carduus pycnocephalus*), **Milk thistle** (*Silybum marianum*), **Summer mustard** (*Hirschfeldia incana*): These plants are often found together in the margins of agricultural land or on previously disturbed areas. They are not in danger of spreading and should be left undisturbed until the final condition when the top foot or so of soil should be removed and buried to control the seed bank.

Poison hemlock: This species is biennial, flowering and seeding in its second year. Poison hemlock is found in relatively mesic areas especially in and around riparian areas and perennial wetlands. While it can form monolithic stands, it is often found mixed with the thistles and mustards noted above. When found in these areas and in similar situations, it should be treated in the same fashion as noted above. When it is found in monolithic stands, which have not been previously noted on the site, it should be mowed/weed whipped repeatedly, up to three times, to keep the plant from flowering and setting seed. Alternatively, a broad spectrum herbicide can be used when the plant is in the rosette stage or before it bolts.

In general, weed control will require at least annual surveys and reporting, followed by active management. Weed control on the site will include the following steps:

1. The biological monitor will complete a spring (March - May) survey of the site to identify sprouted material. They will define and map areas that are in need of invasive weed control including the species and note any recommendations.
2. The results of the weed control measures will be reviewed in the annual vegetation monitoring survey. The report will identify the areas and species that were noted for control, identify results, and provide additional recommendations to help meet the restoration performance standards.

3. The weed control methods will take an adaptive management approach. The methods will continue to be refined based upon the previous year's results until the most practicable approach is found.

As mentioned above, complete eradication of weeds may not be feasible unless the weed-infested patches are small.

X. MAINTENANCE PLAN

A. Supplemental Irrigation

As previously noted, artificial drip irrigation will be supplied during the two years after planting to facilitate the establishment of plants. Spray type irrigation should not be used as it facilitates the spread of non-native and invasive vegetation.

B. Protective Devices

Protective devices, *e.g*. tubex tree shelters or wire cages, if installed, will be maintained in good condition. Additional devices will be installed or other measures taken if monitoring indicates shrub damage from herbivory. However, these will be removed prior to the onset of long-term management.

C. Replacement of Dead or Diseased Plant Materials

The planting densities and the performance standards, which are detailed in this plan, assume a certain level of mortality during the monitoring period as well as potential colonization of the site by native species. As long as the performance standards are met, replacement of plant materials will not be necessary. If mortality levels exceed the performance standards, however, the cause of mortality will be investigated and corrective actions taken as necessary to resolve any problems prior to plant replacement. Plants will be replaced only during the appropriate time of year as noted above. Note, though, that plant replacement will not be required as part of the long-term management. Dead species that are not replaced may remain onsite and be allowed to naturally decompose.

XI. REFERENCES

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