

The Metropolitan Water District of Southern California

Agenda

The mission of the Metropolitan Water District of Southern California is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

EOT Committee

D. Erdman, Chair
M. Camacho, Vice Chair
D. Alvarez
G. Bryant
B. Dennstedt
S. Faessel
L. Fong-Sakai
R. Lefevre
J. McMillan
C. Miller
J. Morris
M. Petersen
K. Seckel
T. Smith

Engineering, Operations, and Technology Committee

Meeting with Board of Directors *

July 8, 2024

9:00 a.m.

Monday, July 8, 2024 Meeting Schedule

**09:00 a.m. EOT
11:30 a.m. Break
12:00 p.m. LEG
01:30 p.m. Legal
03:30 p.m. OWS**

Agendas, live streaming, meeting schedules, and other board materials are available here:

**<https://mwdh2o.legistar.com/Calendar.aspx>. Written public comments received by 5:00 p.m. (business days) before the meeting is scheduled will be posted under the Submitted Items and Responses tab available here:
<https://mwdh2o.legistar.com/Legislation.aspx>.**

If you have technical difficulties with the live streaming page, a listen-only phone line is available at 1-877-853-5257; enter meeting ID: 862 4397 5848.

Members of the public may present their comments to the Board on matters within their jurisdiction as listed on the agenda via in-person or teleconference. To participate via teleconference 1-833-548-0276 and enter meeting ID: 815 2066 4276 or click <https://us06web.zoom.us/j/81520664276?pwd=a1RTQWh6V3h3ckFhNmDsUWpKR1c2Zz09>

MWD Headquarters Building • 700 N. Alameda Street • Los Angeles, CA 90012

Teleconference Locations:

3214 Colchester Street • Douglasville, GA 30135

Cedars-Sinai Imaging Medical Group • 8700 Beverly Blvd., Suite M 313 • Los Angeles, CA 90048

Conference Room • 1545 Victory Blvd. 2nd Floor • Glendale, CA 91201

* The Metropolitan Water District's meeting of this Committee is noticed as a joint committee meeting with the Board of Directors for the purpose of compliance with the Brown Act. Members of the Board who are not assigned to this Committee may participate as members of the Board, whether or not a quorum of the Board is present. In order to preserve the function of the committee as advisory to the Board, members of the Board who are not assigned to this Committee will not vote on matters before this Committee.

1. **Opportunity for members of the public to address the committee on matters within the committee's jurisdiction (As required by Gov. Code Section 54954.3(a))**

**** CONSENT CALENDAR ITEMS -- ACTION ****

2. **CONSENT CALENDAR OTHER ITEMS - ACTION**

- A. Approval of the Minutes of the Engineering, Operations, and Technology Committee for June 10, 2024 (Copies have been submitted to each Director, any additions, corrections, or omissions) [21-3538](#)

Attachments: [07082024 EOT 2A \(06102024\) Minutes](#)

3. **CONSENT CALENDAR ITEMS - ACTION**

- 7-1 Award a \$2,197,460 contract to J.F. Shea Construction Inc. for the replacement of a section of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11; and authorize an increase of \$150,000 to an existing agreement with Brown and Caldwell for a new not-to-exceed amount of \$395,000 to provide technical support during construction; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA [21-3523](#)

Attachments: [07092024 EOT 7-1 B-L](#)
[07082024 EOT 7-1 Presentation](#)

- 7-2 Authorize an agreement with Arcadis, U.S. Inc., in an amount not to exceed \$1.525 million for Data Management and Data Analytics Consulting & Implementation Services to implement Phase 1 of the Data Analytics project; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA [21-3525](#)

Attachments: [07092024 EOT 7-2 B-L](#)
[07082024 EOT 7-2 Presentation](#)

**** END OF CONSENT CALENDAR ITEMS ****

4. **OTHER BOARD ITEMS - ACTION**

- 8-1** Authorize a \$600,000 increase to an existing agreement with J.F. Shea Construction Inc. for a new not to exceed amount of \$10.4 million to purchase long-lead equipment for the Sepulveda Feeder Pump Stations Project; the General Manager has determined the proposed action is exempt or otherwise not subject to CEQA (This action is part of a series of projects that are being undertaken to improve the supply reliability for State Water Project dependent areas) **21-3524**

Attachments: [07092024 EOT 8-1 B-L](#)
[07082024 EOT 8-1 Presentation](#)

5. BOARD INFORMATION ITEMS

- 9-2** Colorado River Housing Community Planning Update **21-3536**

Attachments: [07092024 EOT 9-2 Report](#)

6. COMMITTEE ITEMS

- a.** Value Engineering Program Update **21-3539**

Attachments: [07082024 EOT 6a Presentation](#)

- b.** Metropolitan Headquarters Construction Update **21-3540**

Attachments: [07082024 EOT 6b Presentation](#)

- c.** Artificial Intelligence Introduction **21-3541**

Attachments: [07082024 EOT 6c Presentation](#)

- d.** Ensuring Compliance with Water Quality Regulations **21-3542**

Attachments: [07082024 EOT 6d Presentation](#)

7. MANAGEMENT ANNOUNCEMENTS AND HIGHLIGHTS

- a.** Engineering Services activities **21-3543**
Information Technology activities
Water System Operations activities

Attachments: [07082024 EOT 7a Engineering Services Report](#)
[07082024 EOT 7a Information Technology Report](#)
[07082024 EOT 7a Water System Operations Report](#)
[07082024 EOT 7a Presentation](#)

8. SUBCOMMITTEE REPORTS AND DISCUSSION

- a. Discuss and provide direction to Subcommittee on Pure Water Southern California and Regional Conveyance [21-3544](#)

9. FOLLOW-UP ITEMS

NONE

10. FUTURE AGENDA ITEMS

11. ADJOURNMENT

NOTE: This committee reviews items and makes a recommendation for final action to the full Board of Directors. Final action will be taken by the Board of Directors. Committee agendas may be obtained on Metropolitan's Web site <https://mwdh2o.legistar.com/Calendar.aspx>. This committee will not take any final action that is binding on the Board, even when a quorum of the Board is present.

Writings relating to open session agenda items distributed to Directors less than 72 hours prior to a regular meeting are available for public inspection at Metropolitan's Headquarters Building and on Metropolitan's Web site <https://mwdh2o.legistar.com/Calendar.aspx>.

Requests for a disability-related modification or accommodation, including auxiliary aids or services, in order to attend or participate in a meeting should be made to the Board Executive Secretary in advance of the meeting to ensure availability of the requested service or accommodation.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

MINUTES

ENGINEERING, OPERATIONS & TECHNOLOGY COMMITTEE

June 10, 2024

Chair Erdman called the meeting to order at 1:30 p.m.

Members present: Directors Alvarez, Bryant, Camacho, Dennstedt, Erdman, Faessel, Fong-Sakai, Lefevre (AB 2449 “just cause”), McMillan, Miller, Morris, Petersen (entered after roll call), and Seckel.

Director Lefevre stated he is participating under AB 2449 “just cause” because he is a caretaker for a family member. He stated that he was alone in the room.

Members absent: Director Smith.

Other Board Members present: Directors Abdo, Ackerman, Armstrong, Cordero, De Jesus (teleconference posted location), Dick, Garza, Goldberg, Kurtz, Ramos (teleconference posted location) and Sutley.

Committee staff present: Arakelian, Chapman, Hagekhalil, Parsons, Upadhyay, and Wheeler.

1. OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE COMMITTEE ON MATTERS WITHIN THE COMMITTEE'S JURISDICTION (As required by Gov. Code Section 54954.3(a))

None

CONSENT CALENDAR ITEMS – ACTION

2. CONSENT CALENDAR OTHER ITEMS – ACTION

- A.** Approval of the Minutes of the Engineering, Operations, and Technology Committee for May 13, 2024 (Copies have been submitted to each Director, any additions, corrections, or omissions).

3. CONSENT CALENDAR ITEMS – ACTION

7-2 Subject: Authorize on-call agreements with AECOM, Black & Veatch, and Hazen and Sawyer in amounts not to exceed \$3 million each, for a maximum of three years for engineering services; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA.

Presented by: No Presentation

Motion: Authorize on-call agreements with AECOM, Black & Veatch, and Hazen and Sawyer in amounts not to exceed \$3 million each, for a maximum period of three years for engineering services.

No Director comments or questions.

7-3 Subject: Award a \$897,469 contract to Exaro Technologies Corporation to construct a cathodic protection system along the Santa Monica Feeder; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA.

Presented by: No Presentation

Motion: Award an \$897,469 contract to Exaro Technologies Corporation for the construction of a cathodic protection system on the Santa Monica Feeder.

No Director comments or questions.

Director Fong-Sakai recused herself on Item 7-2 as it involves authorizing an agreement with AECOM, and she currently owns AECOM stock.

Director Fong-Sakai abstained on Item 2A as she was not present at the May 13, 2024 meeting.

Director Morris made a motion seconded by Director Dennstedt to approve Items 2A, 7-2 and 7-3.

The vote was:

Ayes: Directors Alvarez, Bryant, Camacho, Dennstedt, Erdman, Faessel, Fong-Sakai, Lefevre, McMillan, Miller, Morris, and Seckel

Noes: None

Abstentions: Director Fong-Sakai (Item 2A)

Not Voting: Director Fong-Sakai (Item 7-2)

Absent: Directors Petersen and Smith

The motion for Items 2A and 7-2 passed by a vote of 11 ayes, 0 noes, 1 abstention/1 not voting, and 2 absent.

The motion for Item 7-3 passed by a vote of 12 ayes, 0 noes, 0 abstentions, and 2 absent.

Director Lefevre stated that he was alone in the room whilst casting his vote.

**** END OF CONSENT CALENDAR ITEMS ****

4. OTHER BOARD ITEMS – ACTION

8-1 Subject: Approve and appropriate an increase of \$25 million to the Capital Investment Plan for fiscal years 2022/23 and 2023/24 for a new biennium amount of \$625 million; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA.

Presented by: Michael Thomas, Capital Program Management Unit Manager, Engineering Services Group

Motion: Approve and appropriate an increase of \$25 million to the Capital Investment Plan for FYs 2022/23 and 2023/24 budget for a new biennium amount of \$625 million.

The following Directors provided comments or asked questions:

1. Miller
2. Dennstedt

Staff responded to the Directors' questions and comments.

After completion of the presentation, Director Morris made a motion seconded by Director Bryant to approve item 8-1.

The vote was:

Ayes: Directors Alvarez, Bryant, Camacho, Dennstedt, Erdman, Faessel, Fong-Sakai, Lefevre, McMillan, Miller, Morris, and Seckel

Noes: None

Abstentions: None

Absent: Directors Peterson and Smith

The motion for Item 8-1 passed by a vote of 12 ayes, 0 noes, 0 abstentions, and 2 absent.

Director Lefevre stated that he was alone in the room whilst casting his vote.

5. BOARD INFORMATION ITEMS

None

6. COMMITTEE ITEMS

- a. Subject: Capital Investment Plan quarterly report for period ending March 30, 2024.

Presented by: Jeff Nikolas, Senior Engineer, Engineering Services Group

Mr. Nikolas reported on the following:

- Capital Investment Plan for the third quarter of fiscal year 2023/24, covering January 2024 through March 2024.
- Summary of key actions and accomplishments detailed in the report provided in the board packet.

The following Directors provided comments or asked questions.

1. Miller
2. Erdman

Staff responded to the Directors' questions and comments.

Vice Chair Camacho left the room at 1:56 p.m.

- b. Subject: Celebrating the History of Water Quality at Metropolitan

Presented by: Dr. Paul Rochelle, Water Quality Section Manager, Treatment & Water Quality Group

Dr. Rochelle presented the following:

- Formation of Metropolitan's Water Quality and Research Branch in response to the passage of the Safe Drinking Water Act in 1974.
- 50-Year history of Water Quality Section.
- Research, innovation, and new analytical tools in response to increasing regulations and expanded needs.

The following Director provided comments or asked questions.

1. Seckel
2. Erdman

Staff responded to the Directors' questions and comments.

Director Petersen entered the room at 2:12 p.m.

c. Subject: Report on U.S. Environmental Protection Agency Climate Pollution Reduction Grant Memorandum of Agreement with Coalition Members to fund proposed Targeted Zero-Emission Vehicles and Infrastructure for Water Utilities Program

Presented by: Elizabeth Crosson, Chief Sustainability, Resiliency & Innovation Officer
Rosa Castro, Grants & Research Unit Manager, Office of Sustainability, Resiliency & Innovation

Ms. Crosson and Ms. Castro reported on the following:

- Grant funding opportunity for zero-emission vehicles and infrastructure for water utilities.
- U.S. EPA Climate Pollution Reduction Grant overview, proposal, and program benefits
- Coalition with member agencies and sub-agencies, including Memorandum of Agreement.

The following Directors provided comments or asked questions.

1. Fong-Sakai
2. Miller
3. Dick

Staff responded to the Directors' questions and comments.

Vice Chair Camacho returned to the room at 2:31 p.m.

7. MANAGEMENT ANNOUNCEMENTS AND HIGHLIGHTS

a. Subject: Engineering Services
Information Technology
Water System Operations Activities

Presented by: Deven Upadhyay, Executive Officer/Assistant General Manager, Water Resources
Shane Chapman, Assistant General Manager, Operations

Mr. Upadhyay reported on the following:

- Correction of recent Sepulveda Feeder PCCP Rehabilitation (Reach 9) Board letter erroneously referencing RFP 1168 rather than RFQ 1305.
- 9th Annual Engineering Services and Water System Operations Partnering Workshop.
- 2024 Member Agency Engineering Managers Annual Workshop.
- CRA Overhead Crane Replacement Project.

Mr. Chapman reported on the following:

- Current operational conditions and shutdowns.
- Upcoming Member Agency Water Quality Managers Nitrification Workshop.

Water System Operations alignment into three new Groups: Conveyance and Distribution Group, Treatment and Water Quality Group, and Integrated Operations, Planning and Support Services Group.

8. SUBCOMMITTEE REPORTS AND DISCUSSION

- a. Discuss and provide direction to Subcommittee on Pure Water Southern California and Regional Conveyance.

The following Director provided comments or asked questions.

1. McMillan

Staff responded to the Directors' questions and comments.

Director Petersen confirmed at 2:53 p.m.

9. FOLLOW-UP ITEMS

NONE

10. FUTURE AGENDA ITEMS

NONE

11. ADJOURNMENT

The next meeting will be on July 8, 2024.

Meeting adjourned at 2:54 p.m.

Dennis Erdman
Chair



- **Board of Directors**
Engineering, Operations, and Technology Committee

7/9/2024 Board Meeting

7-1

Subject

Award a \$2,197,460 contract to J.F. Shea Construction Inc. for the replacement of a section of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11; and authorize an increase of \$150,000 to an existing agreement with Brown and Caldwell for a new not-to-exceed amount of \$395,000 to provide technical support during construction; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

The Rialto Pipeline supplies untreated water from the East Branch of the State Water Project to the F.E. Weymouth Water Treatment Plant (Weymouth plant). This project will replace a deteriorated 35-foot-long segment of 120-inch diameter steel pipe on the Rialto Pipeline and rehabilitate Service Connection CB-11. Inspections have shown that the mortar lining is failing, and the steel pipe is corroding within the portion to be replaced. These improvements will enhance the reliability of water deliveries along the Rialto Pipeline.

This action awards a \$2,197,460 contract to J.F. Shea Construction Inc. for replacement of 35 feet of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11 during a planned 2024/2025 shutdown. This action also increases the amount of an existing agreement with Brown and Caldwell to provide technical support during construction. See **Attachment 1** for the Allocation of Funds, **Attachment 2** for the Abstract of Bids, **Attachment 3** for the Subcontractors for Low Bidder, and **Attachment 4** for the Location Map.

Proposed Action(s)/Recommendation(s) and Options

Staff Recommendation: Option #1

Option #1

- a. Award a \$2,197,460 contract to J.F. Shea Construction Inc. for replacement of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11.
- b. Authorize an increase of \$150,000 to an existing agreement with Brown and Caldwell for a new not-to-exceed amount of \$395,000 to provide construction support services.

Fiscal Impact: Expenditure of \$3,600,000 in capital funds. All costs will be incurred in the current biennium and have been previously authorized.

Business Analysis: This option will improve the operational reliability of the Rialto Pipeline and reduce the risk of unplanned outages.

Option #2

Do not proceed with the project at this time.

Fiscal Impact: None

Business Analysis: This option will forego an opportunity to improve the operational reliability of the Rialto Pipeline, which may lead to costly urgent repairs.

Alternatives Considered

During the planning phase of this project, staff considered different options to address the failure of mortar lining and corrosion within an approximately 35-foot-long segment of the Rialto Pipeline. Initially staff considered performing weld repairs and cement mortar re-lining of the existing pipeline using an existing accessway that is located over 700 feet from the repair site. Staff estimated that repairing the pipeline from the existing accessway would require cutting steel pipe segments into small strips, transporting them through the pipe, and reassembling them inside the 120-inch diameter pipe. The selected option to excavate and replace the 35-foot segment of pipe in its entirety can be completed more efficiently and cost-effectively during a shorter shutdown than repairing the existing pipe.

Applicable Policy

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

Related Board Action(s)/Future Action(s)

By Minute Item 53141, dated February 13, 2023, the Board authorized the procurement of a triple offset valve to rehabilitate the CB-11 service connection.

By Minute Item 53494, dated January 9, 2024, the Board authorized the procurement of plug valves to be installed on the Foothill and Rialto Feeder.

By Minute Item 53598, dated April 9, 2024, the Board appropriated a total of \$636.5 million for projects identified in the Capital Investment Plan for Fiscal Years 2024/25 and 2025/26.

Summary of Outreach Completed

Metropolitan has coordinated with the City of Upland to obtain approved plan check drawings and a noise variance for the proposed construction activities.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is exempt from CEQA because the action consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of existing or former use and no possibility of significantly impacting the physical environment. In addition, the proposed action consists of replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced.

CEQA determination for Option #2:

None required

Details and Background

Background

The Rialto Pipeline was built in 1972 and conveys untreated water from California Department of Water Resources' Devil Canyon Powerplant afterbays in San Bernardino to Metropolitan's Live Oak Reservoir in La Verne and Metropolitan's nearby San Dimas Power Plant. The pipeline extends approximately 30 miles, supplying water to the Weymouth plant and serving three member agencies through 11 service connections.

Approximately 16 miles of the Rialto Pipeline are prestressed concrete cylinder pipe, while the remaining 14 miles are welded steel pipe. The pipeline ranges in diameter from 96 inches to 120 inches.

A December 2020 inspection of the Rialto Pipeline revealed severe corrosion and localized pitting in an approximately 35-foot-long segment of a 120-inch diameter steel pipe located in the City of Upland. Temporary repairs were made, and this section of pipe is currently structurally sound. Replacement of this segment is recommended due to the extent of damage and to ensure the long-term integrity of the pipeline. Replacement of the section of pipe will also allow for the rehabilitation of Service Connection CB-11, which is located in the vicinity of the damaged section of pipe.

The turnout structure for Service Connection CB-11, located in the City of Rancho Cucamonga, was originally constructed as a dewatering pump well under the original Rialto Pipeline construction contract. In 2005, the turnout was converted to a 40 cubic feet per second service connection to deliver water to recharge groundwater basins, and a 24-inch diameter butterfly valve was installed. Since that conversion, this turnout can no longer be used as a dewatering location on the pipeline. The existing butterfly valve has a disk in the flow path that obstructs lowering a pump through the valve and into the pipeline for dewatering activities.

The Rialto Pipeline is typically shut down and dewatered every five to seven years for inspections and maintenance. During the planned shutdown, the valve at Service Connection CB-11 will be replaced with a full-port triple offset valve that will allow staff to lower a dewatering pump into the pipeline at this location. The use of this location to dewater the pipeline will shorten the overall duration of future shutdowns of the pipeline by approximately 24 hours. In addition to replacing the turnout valve, piping adjacent to the turnout valve and six blowoff valves on the feeder have deteriorated and will also be replaced during the shutdown.

Final design is now complete for replacement of the deteriorated section of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11. Due to the long lead time for the manufacture of large-diameter valves, a procurement contract was awarded in February 2023 by Metropolitan's Board for the 20-inch isolation valve. The valve has been delivered and is currently being stored at Metropolitan's La Verne facility. Staff recommends the award of a construction contract at this time.

Rialto Pipeline Rehabilitation – Construction

The scope of the construction contract consists of replacing a 35-foot segment of 120-inch diameter steel pipe on the Rialto Pipeline, replacement of the isolation valve at Service Connection CB-11 with a Metropolitan-furnished triple offset ball valve, and replacement of corroded piping. Metropolitan forces will dewater the pipelines, replace six deteriorating blowoff valves, establish clearances, and return the system to service. The work will be conducted during a planned twelve-day shutdown scheduled for February 2025.

A total of \$3,600,000 is allocated for this work. In addition to the contract amount, \$150,000 will be allocated for technical support during construction by Brown and Caldwell as described below. Allocated funds for work by Metropolitan staff include: \$530,000 for Metropolitan force shutdown activities; \$207,000 for construction management and inspection; \$177,000 for submittals review, responding to requests for information, and preparation of record drawings; \$144,000 for contract administration, environmental monitoring support, project management, and other owner's costs; and \$194,540 for remaining budget. **Attachment 1** provides the allocation of the required funds.

Award of Construction Contract (J.F. Shea Construction Inc.)

Specification No. 2058 to rehabilitate the Rialto Pipeline was advertised for bids on May 3, 2024. As shown in **Attachment 2**, two bids were received and opened on June 6, 2024. The low bid from J.F. Shea Construction Inc. in the amount of \$2,197,460 complies with the requirements of the specifications. The other bid was \$2,433,000, while the engineer's estimate for this project was approximately \$2,650,000. For this contract, Metropolitan established a Small Business Enterprise participation level of at least 25 percent of the bid amount. J.F. Shea Construction Inc. has agreed to meet this level of participation. The subcontractors for this contract are listed in **Attachment 3**.

This action awards a \$2,197,460 contract to J.F. Shea Construction Inc. for the replacement of a 35 ft section of steel pipe on the Rialto Pipeline and the replacement of piping and an isolation valve located at Service Connection CB-11. As described above, Metropolitan staff will perform construction management and inspection. Engineering Services' performance metric target range for construction management and inspection of projects with construction less than \$3 million is 9 to 15 percent. For this project, the performance metric goal for inspection, which includes previously allocated fabrication inspection (\$70,000), is 8.2 percent of the total construction cost (\$3,382,460), which includes the construction contract (\$2,197,460), Metropolitan-furnished equipment (\$655,000), and Metropolitan force construction (\$530,000).

Construction Support (Brown and Caldwell) – Amendment to Existing Agreement

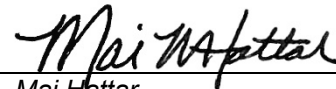
This action authorizes an increase of \$150,000 to an existing agreement with Brown and Caldwell for a new not-to-exceed total of \$395,000. Brown and Caldwell was prequalified via Request for Qualification No. 1215 based on its experience with pipeline projects through urban areas. Brown and Caldwell provided engineering support services during the project's final design phase and is the engineer of record.

Brown and Caldwell will review contractor submittals and requests for information, review the asbestos control plan prior to submittal to the South Coast Air Quality Management District, and provide asbestos abatement monitoring services. The increase in the Brown and Caldwell agreement supplements the existing agreement's capacity to cover costs for the construction phase of the Rialto Pipeline Rehabilitation project.

This action authorizes a \$150,000 amendment to an existing agreement with Brown and Caldwell for a new, not-to-exceed total of \$395,000 for technical support during construction for the rehabilitation of the Rialto Pipeline. The subconsultant planned for this agreement includes Aurora Industrial Hygiene.

Project Milestone

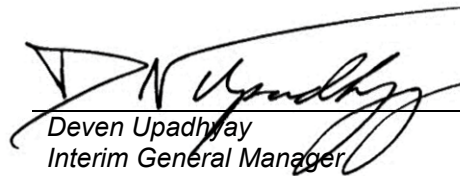
March 2025 – Completion of construction



Mai Hattar
Interim Chief Engineer
Engineering Services

6/26/2024

Date



Deven Upadhyay
Interim General Manager

6/26/2024

Date

Attachment 1 – Allocation of Funds

Attachment 2 – Abstract of Bids

Attachment 3 – Subcontractors for Low Bidder

Attachment 4 – Location Map

Ref# es12699997

Allocation of Funds for Rialto Pipeline Rehabilitation

	Current Board Action (Jul. 2024)
Labor	
Studies & Investigations	\$ -
Final Design	-
Owner Costs (Program mgmt., envir. monitoring)	144,000
Submittals Review & Record Drwgs.	177,000
Construction Inspection & Support	207,000
Metropolitan Force Construction	500,000
Materials & Supplies	-
Incidental Expenses	30,000
Professional/Technical Services	-
Brown and Caldwell	150,000
Right-of-Way	-
Equipment Use	-
Contracts	-
J.F. Shea Construction, Inc.	2,197,460
Remaining Budget	194,540
Total	\$ 3,600,000

The amount expended to date on the Rialto Pipeline Rehabilitation project is approximately \$1 million. The total estimated cost to complete this project, including the funds allocated for the work described in this action, is \$4.6 million.

The Metropolitan Water District of Southern California**Abstract of Bids Received on June 6, 2024, at 2:00 P.M.****Specifications No. 2058****Rialto Pipeline Rehabilitation**

The work consists of replacement of a 35-foot section of steel pipe on the Rialto Pipeline and the replacement of a pipe spool and isolation valve located at service connection CB-11 for the Rialto Pipeline Rehabilitation project.

Engineer's estimate: \$2,650,000

Bidder and Location	Total	SBE \$	SBE %	Met SBE¹
J.F. Shea Construction Inc. Walnut, CA	\$2,197,460	550,000	25	Yes
Mladen Buntich Construction Co. Inc Upland, CA	\$2,433,000	-	-	-

¹ Small Business Enterprise (SBE) participation level established at 25 percent for this contract.

The Metropolitan Water District of Southern California**Subcontractors for Low Bidder****Specifications No. 2058
Rialto Pipeline Rehabilitation****Low bidder: J.F. Shea Construction Inc.**

Subcontractor and Location	Service Category, Specialty
Western Paving Contractors Inc. Irwindale, CA	Paving
Environmental Construction Group Signal Hill, CA	Demolition/Abatement
Capital Industrial Coatings Huntington Beach, CA	Painting
Dean's Welding Temecula, CA	Furnish, Fitup & Weld Pipe





Engineering, Operations, & Technology Committee

Rialto Pipeline Rehabilitation

Item 7-1

July 8, 2024

Item 7-1

Rialto Pipeline Rehabilitation

Subject

Award a \$2,197,460 contract to J.F. Shea Construction Inc. for the replacement of a section of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11; and authorize an increase of \$150,000 to an existing agreement with Brown and Caldwell for a new not-to-exceed amount of \$395,000 to provide technical support during construction

Purpose

This action rehabilitates a 35-foot section of steel pipe and Service Connection CB-11 on the Rialto Pipeline which will enhance the reliability of water deliveries

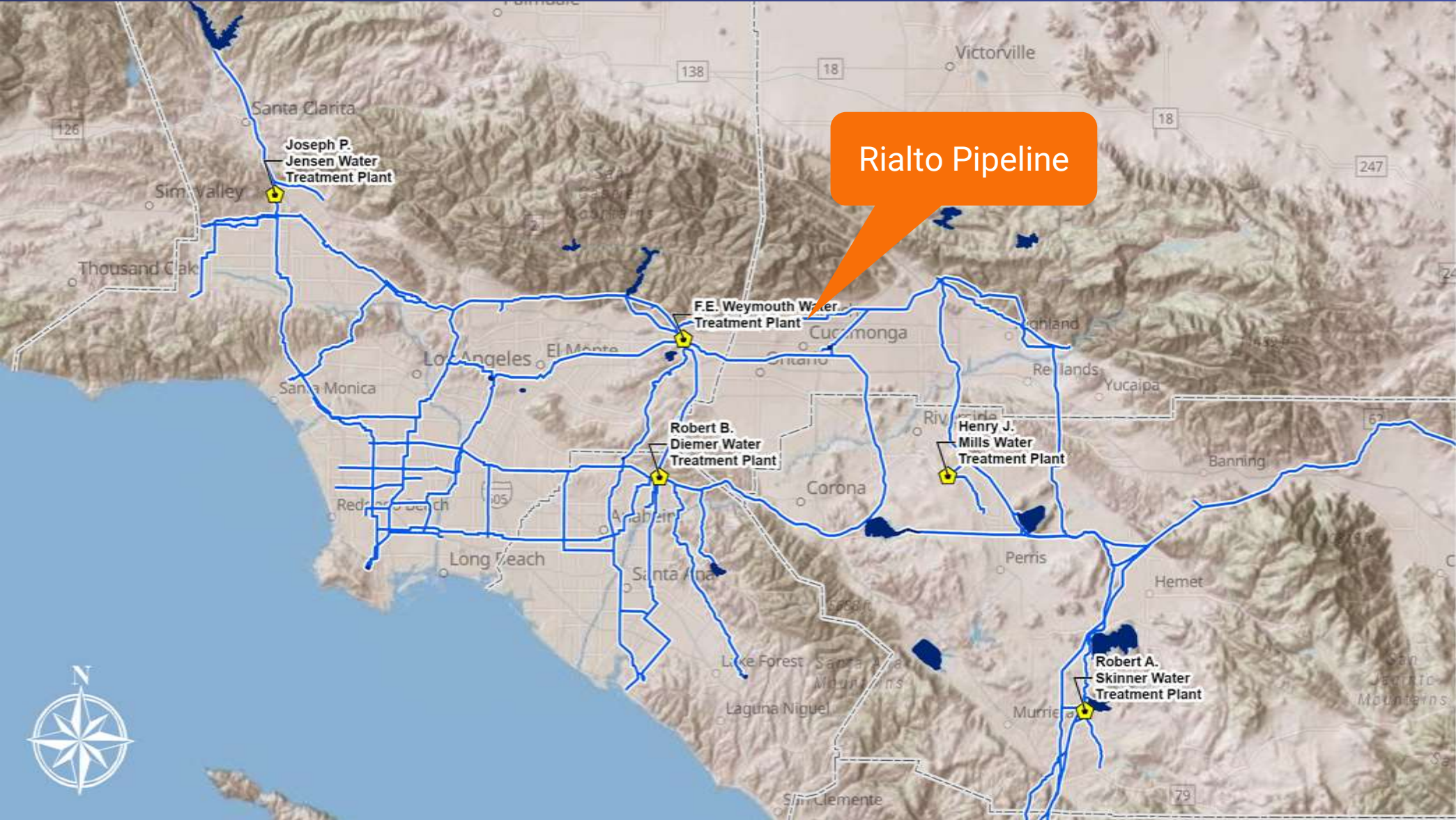
Recommendation and Fiscal Impact

Award a construction contract to rehabilitate a portion of the Rialto Pipeline and Service Connection CB-11

Fiscal Impact of \$3,600,000

Budgeted

Location Map



Background

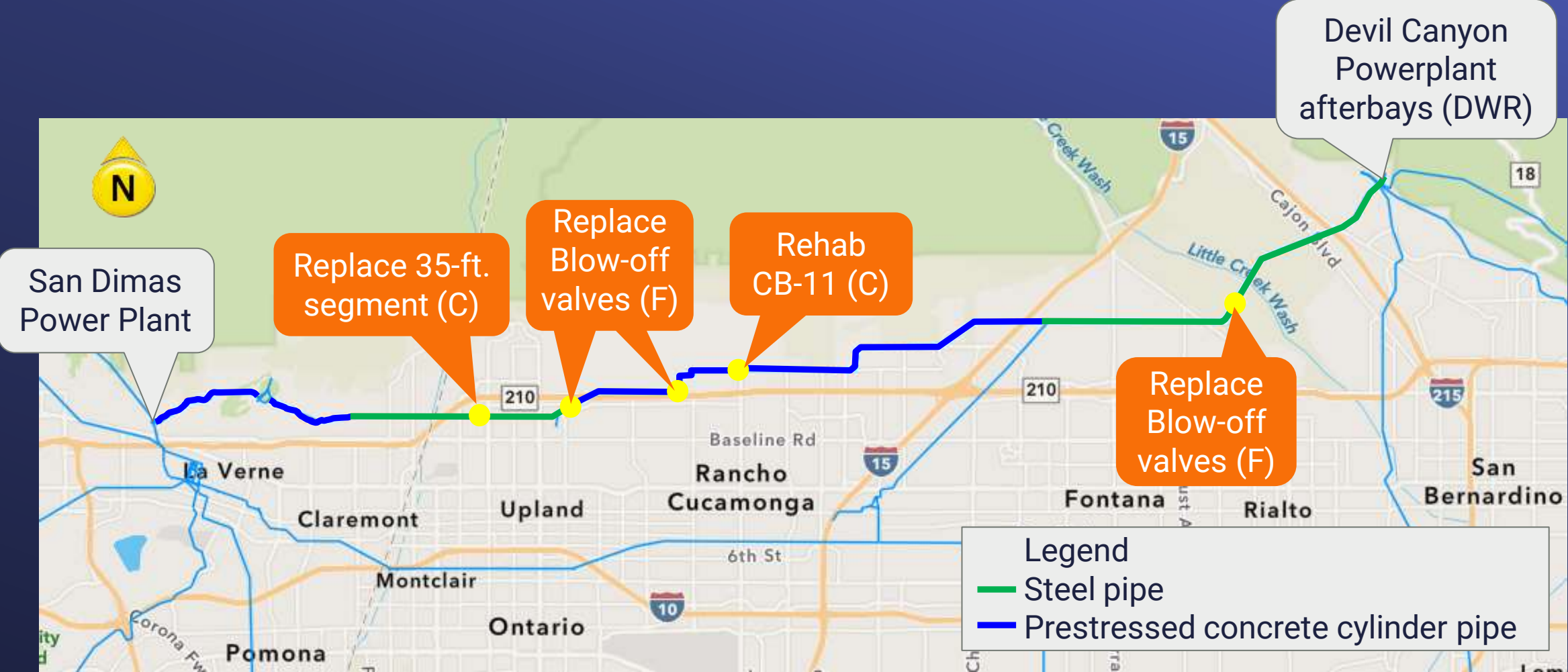


Severe corrosion and pitting in 120-inch diam.
35-ft. steel segment (Dec. 2020 inspection)



Existing deteriorated blow-off
valve, typical of six

Rehabilitation work

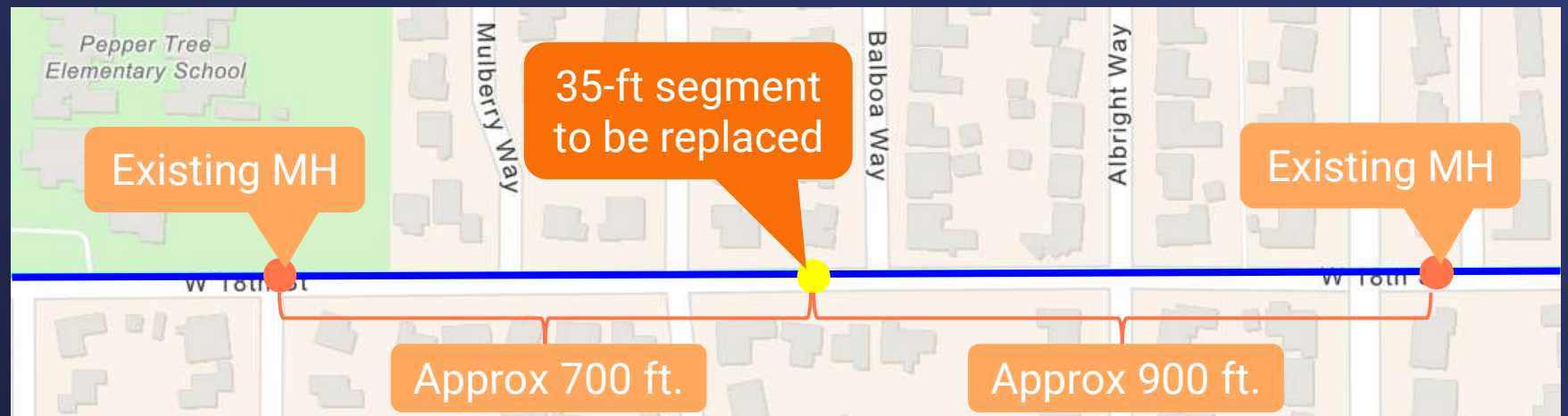


Rialto Pipeline Rehabilitation by Contractor (C) or Metropolitan Forces (F)

Rialto Pipeline Rehabilitation Construction

Alternatives Considered

- Perform weld repairs & cement mortar re-lining
 - No excavation required
 - Longer repair duration requires two shutdowns
 - Extensive weld repairs
- Selected Alternative - Replace 35-foot section of pipe
 - Shorter repair duration - can be completed in one shutdown



Rialto Pipeline Rehabilitation Construction

Brown and Caldwell – Agreement Amendment

- Engineer of record for final design
- Scope of Work
 - Review contractor submittals
 - Respond to RFIs
 - Provide monitoring services
- Amendment amount: \$150,000
- New NTE amount: \$395,000
- SBE participation level: 25%

Rialto Pipeline Rehabilitation Construction



New 20" triple offset ball valve

Scope of Work

- Contractor
 - Remove & replace a 35-foot segment of 121.5-inch diameter steel pipe
 - Replace isolation valve & corroded piping at Service Connection CB-11
- Metropolitan
 - Shutdown pipeline & return to service
 - Install blow-off valves
 - Construction management & inspection
 - Project management, public outreach & contract administration

Bid Results

Specifications No. 2058

Bids Received	June 6, 2024
No. of Bidders	2
Low Bid	\$2,197,460
Other Bid	\$2,433,000
Engineer's Estimate	\$2,650,000
SBE Participation*	25%

*SBE (Small Business Enterprise) participation level set at 25%

Allocation of Funds

Rialto Pipeline Rehabilitation

Metropolitan Labor

Owner Costs (Proj. Mgmt., Contract Admin., Envir. Support) \$ 144,000

Construction Inspection & Support 207,000

Force Construction 500,000

Submittals Review, Tech. Support, Record Dwgs. 177,000

Materials & Incidentals 30,000

Professional/Technical Services

Brown and Caldwell 150,000

Contracts

J.F. Shea Construction Inc. 2,197,460

Remaining Budget 194,540

Total \$ 3,600,000

Project Schedule



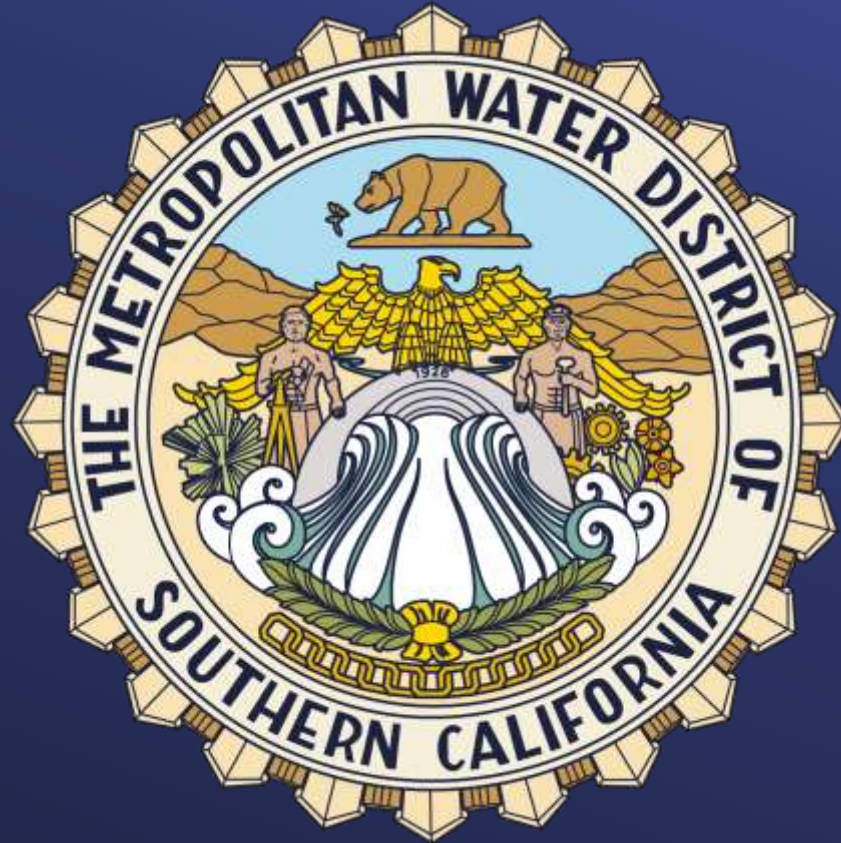
Board Options

- Option #1
 - a. Award a \$2,197,460 contract to J.F. Shea Construction Inc. for replacement of steel pipe on the Rialto Pipeline and rehabilitation of Service Connection CB-11.
 - b. Authorize an increase of \$150,000 to an existing agreement with Brown and Caldwell for a new not-to-exceed amount of \$395,000 to provide construction support services.
- Option #2

Do not proceed with the project at this time.

Staff Recommendation

- Option #1





- **Board of Directors**
Engineering, Operations, and Technology Committee

7/9/2024 Board Meeting

7-2

Subject

Authorize an agreement with Arcadis, U.S. Inc., in an amount not to exceed \$1.525 million for Data Management and Data Analytics Consulting & Implementation Services to implement Phase 1 of the Data Analytics project; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

This project will modernize Metropolitan's data analytics capabilities empowering staff (users) to access and analyze data to support decision-making and reporting more efficiently. Arcadis was chosen as the successful respondent to Request for Proposal (RFP) DH-1348, published on May 24, 2023. This project will establish a centralized standard data warehouse to facilitate efficient data-driven decision-making, reduce data quality issues and eliminate extensive manual report preparation.

During an extensive process, staff from all groups were interviewed, and 25 priority use cases were defined. A Data Analytics use case is the use of an automated processes to access multiple data sources to efficiently create useful information that informs decision-making and routine reporting. In addition to the design and implementation of the data warehouse that will support the 25 priority use cases, this first phase of the project will develop two of the 25 priority use cases including: (1) Developing an Automated Water Operations Dashboard and (2) Automating financial reporting activities.

Timing and Urgency

There is currently no centralized enterprise data warehouse that allows sharing and meaningful integration of data across the enterprise to serve quick business analytics for decision-makers and analytics users. Currently, significant staff time is dedicated to collecting data and generating reports every time certain data is requested because of the limited availability of a centralized enterprise data warehouse.

There are a few data marts currently managed by Metropolitan's Business Intelligence team which are used to generate some key analytics such as limited financials, project controls, water sales, etc. However, the data processes and data management techniques are outdated and need redesign, automation, and modernization due to the ever-increasing volume of business data and the introduction of new business-specific applications. Additionally, there are currently no fundamental data governance guidelines in place across the organization, at the enterprise level or at the business group level.

Proposed Action(s)/Recommendation(s) and Options

Staff Recommendation: Option #1

Option #1

Authorize an agreement with Arcadis, U.S. Inc., in an amount not to exceed \$1.525 million for Data Management and Data Analytics Consulting & Implementation Services to implement Phase 1 of the Data Analytics project.

Fiscal Impact: Expenditures of \$1.880 million in capital funds for 2024-2026

Business Analysis: This option would implement the prerequisite data management processes, including the design of the enterprise data warehouse and the development of reporting dashboards for two high-priority use cases.

Option #2

Authorize an agreement with Arcadis, U.S. Inc., in an amount not to exceed \$945k for Data Management and Data Analytics Consulting & Implementation Services to implement a subset of Phase 1 of the Data Analytics project.

Fiscal Impact: Expenditures of \$1.3 million in capital funds for 2024-2026

Business Analysis: This option would implement the prerequisite data management processes, including the design of the enterprise data warehouse and the development of reporting dashboards for one high-priority use case.

Option #3

Do nothing at this time

Fiscal Impact: No expenditures of capital funds

Business Analysis: Metropolitan will continue generating manual reports to support business decisions.

Alternatives Considered

Option #2 and Option #3

Applicable Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

Related Board Action(s)/Future Action(s)

By Minute Item 52778, dated April 12, 2022, the Board appropriated a total of \$600 million for projects identified in the Capital Investment Plan for Fiscal Years 2022/23 and 2023/2024.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is exempt from CEQA because there is no potential for the activity in question to have a significant effect on the environment. (State CEQA Guidelines Section 15061(b)(3).)

CEQA determination for Option #2 and Option #3:

None required

Details and Background

Background

Metropolitan has numerous data repositories within its enterprise systems, including Oracle Financials (EBS), Supervisory Control and Data Acquisition system, and Water Information System, among other enterprise applications.

Data from these systems should be optimized in order to be analyzed, retrieved, governed, stored, and shared across various business groups. As a prerequisite, there is a need to collect and integrate data from the applicable systems, design and develop new data marts, and develop an enterprise data warehouse which would facilitate implementation of various data analytics use cases, as well as enable self-service analytics and reporting.

RFP DH-1348 was issued for Data Management and Data Analytics Consulting & Implementation Services on May 24, 2023, and closed on July 7, 2023. Metropolitan received a total of nineteen responsive proposals from the competitive process. The Business Outreach participation goal designated for this solicitation was ten percent.

Proposals were reviewed by staff from the groups. After careful deliberation, the evaluation team chose Arcadis as the winner of the RFP. Arcadis has 30+ years of experience in delivering these types of services and is qualified as both a Small Business Enterprise and a Regional Business Enterprise. Based on their proposal, references, and experience, the RFP evaluation panel recommended this vendor be awarded all components of the work.


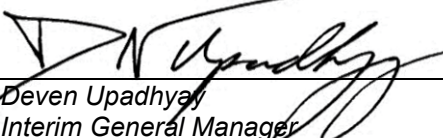
Scope of Work

The scope of work for this project includes:

- Analyze, review and assess the selected two use cases under Phase 1.
- Engage Metropolitan Stakeholders and business groups in multiple workshops/working sessions.
- Finalize and document requirements, data sources, and use case definitions.
- Build the technical foundation for the data analytics project to implement 25 use cases.
- Based on the updated data sources and other key use case components from these working sessions, design, architect and develop additional data marts that are not currently present but are needed for the selected use cases.
- Redesign the existing data marts to incorporate common/conformed facts and dimensions to allow the information to be combined with other data sources, upgrade data load processes, tune for performance, and enhance data integrity.
- Design, architect and implement the end-to-end solution for the selected use cases under Phase 1 (includes data models, automated data processes, and analytics dashboards).
- Provide knowledge transfer sessions for Metropolitan users.
- The technical foundation will result in reduced costs for the remaining use cases. Staff will return to the Board with a detailed plan for implementing the remaining priority use cases.

This action authorizes \$1.880 million for the Data Management and Data Analytics Consulting and Implementation Services Project. The total project budget includes funds for awarding a new contract with Arcadis for \$1.525 million for professional and technical services. Other costs included are \$250k for internal labor costs by Metropolitan staff, including owner costs and project management, and \$105k in contingency funds. Most of the costs will be used for building the data marts and integrations between systems in order to produce the data necessary for the two high-priority use cases. Less back-end development work will be required for the remainder of the 25 use cases. Upon completion of Phase I, future phases will be brought to the Board for authorization for the development of the remainder of the 25 use cases.

This project has been evaluated and recommended by Metropolitan's Capital Investment Plan Evaluation Team, and funds are available within the fiscal year 2022/24 capital expenditure plan. See **Attachment 1** for the Financial Statement.

 Charlie Eckstrom Group Manager, Information Technology	6/24/2024 Date
 Deven Upadhyay Interim General Manager	6/28/2024 Date

Attachment 1 – Financial Statement

Ref# IT12691559

Allocated Funds for Enterprise Data Analytics

	Current Board Action (July 2024)
Labor	
Studies & Investigations	\$ -
Final Design	-
Owner Costs (Program mgmt.)	250,000
Submittals Review & Record Drwgs	-
Construction Inspection & Support	-
Metropolitan Force Construction	-
Materials & Supplies	-
Incidental Expenses	-
Professional/Technical Services	1,525,000
Equipment Use	-
Contracts	-
Remaining Budget	105,000
Total	\$ 1,880,000



Engineering, Operations, & Technology Committee

Data Management and Data Analytics Consulting & Implementation Services Phase I

Item 7-2

July 8, 2024

Subject

Authorize and agreement with Arcadis, U.S. Inc. in an amount not to exceed \$1.525 million for the Data Management and Data Analytics Consulting and Implementation Services Phase 1

Purpose

- Modernize data and analytics capabilities
- Establish an agile, cross-functional operating model to derive meaningful data insights
- Enables data-driven, fast and effective decision-making

Recommendation and Fiscal Impact

Authorize an agreement with Arcadis, U.S. Inc.
Fiscal Impact of \$1,880,000

Budgeted

Item 7-2

Data Management and Data Analytics Consulting & Implementation Services Phase 1

What is Data Analytics?



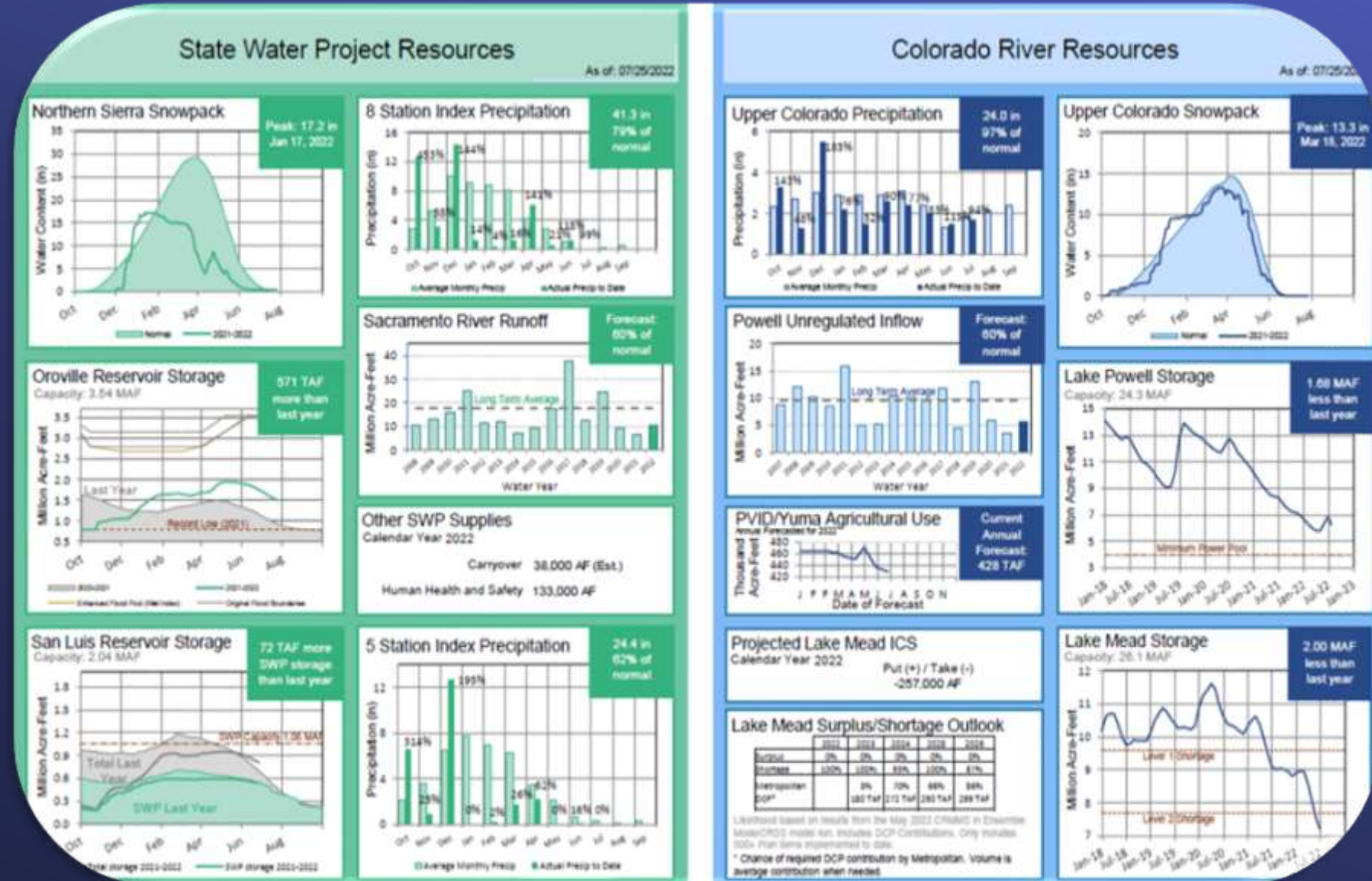
Data Analytics

[ˈdā-tə ɑ-nə-ˈli-tiks]

The science of analyzing raw data to make conclusions about that information.

- Enhance decision-making capabilities
- Improve operational efficiencies and minimize risks
- Establish predictive analytics and prescriptive analytics

Data Analytics Example 1



State Water and Colorado Resources Dashboard - All-in-one-place,
powered by automated data processes

Data Analytics
Example 2



Rideshare Dashboard

Background

- Metropolitan has numerous data repositories including SCADA, WINS, Oracle Financials, LIMS, etc.
- Data maintained in silos, not integrated with other systems
- Historical data not readily available
- Reports generated manually

Previous Activities

- Interviewed Metropolitan business users in working sessions
- Identified 81 use cases and prioritized Top 25
- Developed Data Analytics Strategy, Current & Future State Architecture & Implementation Roadmap
- Implemented a Proof of Concept (POC) using Machine Learning showcasing anomaly detection on Billing Meter readings
- Issued an RFP for Top 25 use cases implementation

Data Management
and Data
Analytics
Consulting &
Implementation
Services Phase 1

Metropolitan Scope of Work

- Project management
- Technical oversight
- Provide infrastructure & toolsets
- Review of consultant's work

Data Management and Data Analytics Consulting & Implementation Services Phase 1

New Agreement – Arcadis, U.S. Inc.

- Selected through RFP No. 1348
- Scope of Work
 - Develop enterprise data warehouse framework for 25 use-cases
 - Develop and implement two use-cases:
 - One using both IBM Cognos Analytics and Microsoft Power BI
 - Second to be developed using one of these technologies
 - Provide knowledge transfer sessions for Metropolitan users
- NTE amount: \$1,880,000
- SBE participation level: 10%

Allocation of Funds

Data Management and Data Analytics Consulting & Implementation Services Phase 1

Metropolitan Labor	\$ 250,000
Professional/Technical Services	
Arcadis, U.S. Inc.	1,525,000
Contingency	105,000
<hr/>	
Total	\$ 1,880,000

Project Schedule

Project	2024		2025	
	Q3	Q4	Q1	Q2
Data Management and Data Analytics Consulting & Implementation Services Phase 1				
	<div><div></div> Preliminary Design</div> <div><div></div> Final Design</div> <div><div></div> Development</div>			
	<div><div></div> Board Action</div> <div><div></div> Completion</div>			

Board Options

- Option #1

Authorize an agreement with Arcadis, U.S. Inc., in an amount not to exceed \$1.525 million for Data Management and Data Analytics Consulting & Implementation Services to implement Phase 1 of the Data Analytics project.

- Option #2

Authorize an agreement with Arcadis, U.S. Inc., in an amount not to exceed \$945k for Data Management and Data Analytics Consulting & Implementation Services to implement a subset of Phase 1 of the Data Analytics project.

- Option #3

Do nothing at this time.

Staff Recommendation

- Option #1





- **Board of Directors**
Engineering, Operations, and Technology Committee

7/9/2024 Board Meeting

8-1

Subject

Authorize a \$600,000 increase to an existing agreement with J.F. Shea Construction Inc. for a new not-to-exceed amount of \$10.4 million to purchase long-lead equipment for the Sepulveda Feeder Pump Stations Project; the General Manager has determined the proposed action is exempt or otherwise not subject to CEQA (This action is part of a series of projects that are being undertaken to improve the supply reliability for State Water Project-dependent areas)

Executive Summary

The Sepulveda Feeder pump stations consist of two new pump stations, one each located at the existing Venice and Sepulveda Pressure Control Facilities. The project will allow for water to be pumped from the Central Pool northward through the Sepulveda Feeder, thereby enabling greater deliveries of Colorado River Aqueduct (CRA) and Diamond Valley Lake (DVL) water supplies to State Water Project-dependent agencies in Metropolitan's western service area. The project will lessen the potential impacts of future low State Water Project (SWP) allocations on these agencies. The project utilizes progressive design-build (PDB) delivery to expedite the development of these pump stations.

An advantage of the PDB project delivery process is the ability to make early procurements of long-lead time equipment before the entire design of the facility is completed. The early procurement and delivery of critical equipment then allows for shortened construction/commissioning schedules for the overall project. The initial design of the pump stations under the Phase 1 PDB agreement with J.F. Shea Construction Inc. (J.F. Shea) has progressed to a point where electrical transformers for the two Sepulveda Feeder pump stations have been sized and bids received by the contractor. Procurement of this long-lead-time equipment by the PDB contractor is recommended at this time so that the planned 2026 operational date of the new facilities can be achieved.

This action authorizes a \$600,000 increase to an existing agreement with J.F. Shea for a new not-to-exceed amount of \$10.4 million to purchase long-lead equipment. See **Attachment 1** for the Allocation of Funds and **Attachment 2** for the Location Map.

Proposed Action(s)/Recommendation(s) and Options

Staff Recommendation: Option #1

Option #1

Authorize a \$600,000 increase to an existing design-build services agreement with J.F. Shea Construction Inc. for a new not-to-exceed amount of \$10.4 million to purchase long-lead equipment for the Sepulveda Feeder Pump Stations Project.

Fiscal Impact: Expenditure of \$690,000 in capital funds. All costs will be incurred in the current biennium and have been previously authorized.

Business Analysis: The project will expand Metropolitan's ability to serve Diamond Valley Lake and Colorado River water to a portion of the distribution system that normally receives water from the State Water Project and will provide an alternate route to deliver treated water to the west service area during emergencies or when major feeders are removed from service for rehabilitation.

Option #2

Do not proceed with the procurement at this time.

Fiscal Impact: None

Business Analysis: This option would forego an opportunity for early procurement of long-lead equipment and may impact the project's ability to be ready for the planned 2026 completion.

Alternatives Considered

Alternatives for procuring long-lead equipment for the Sepulveda Feeder Pump Stations Project included using traditional procurement by Metropolitan staff in which drawings and specifications would be developed for advertisement and competitive bidding. It was determined that this traditional method would delay the completion of the project by two years when compared to having the PDB contractor procure equipment directly on a best-value basis. It is recommended that the PDB contractor procure the long-lead equipment identified in this board letter to expedite the project schedule.

Another alternative was to wait until the Guaranteed Maximum Price (GMP) was established and then start procuring equipment. The lead time for fabrication and delivery of some equipment can take up to 18 months, and the GMP will not be finalized until the fourth quarter of 2024. With this approach, there is a risk that equipment will not be delivered in time for the planned 2026 start-up and commissioning of the new facilities.

Staff determined that the recommended option to have the PDB contractor purchase long-lead equipment at this time will provide the earliest possible completion for the project.

Applicable Policy

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 8148: Alternative Project Delivery

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

Related Board Action(s)/Future Action(s)

By Minute Item 52703, dated February 8, 2022, the Board authorized the West Area Water Supply Reliability Improvements.

By Minute Item 53188, dated March 14, 2023, the Board authorized amendments to the Metropolitan Water District Administrative Code to provide for the implementation of new legislation authorizing the use of alternative project delivery methods.

By Minute Item 53377, dated September 12, 2023, the Board authorized an agreement for Phase 1 design-build services for the Sepulveda Feeder Pump Stations Project.

By Minute Item 53598, dated April 9, 2024, the Board appropriated a total of \$636.6 million for projects identified in the Capital Investment Plan for Fiscal Years 2024/25 and 2025/26.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action does not constitute an approval of the project for the purposes of CEQA. Environmental review will be completed prior to any decision by the Board which commits Metropolitan to the project. (State CEQA Guidelines Section 15352.)

CEQA determination for Option #2:

None required

Details and Background

Background

Metropolitan's distribution system was initially constructed in the 1940s to deliver treated CRA supplies throughout its service area. The system was expanded in the 1970s to connect to and distribute SWP water supplies. The distribution system was designed to take advantage of the region's topography and primarily utilizes gravity to move water through the system. Completion of the SWP's West Branch allowed Metropolitan to serve water by gravity flow to areas further west than could be served by CRA water or stored water in DVL. While much of the service area benefits from access to both sources of supply and stored water in DVL, certain portions of the system can only receive limited DVL/CRA water due to inherent hydraulic limitations of the gravity-fed system. During multi-year droughts, as California recently experienced, SWP-dependent areas rely on stored SWP supplies, transfers, and exchange deliveries.

The west service area portion of Metropolitan's distribution system typically receives SWP water via the Jensen plant, Sepulveda Feeder, and connecting pipelines in the northwest portion of Metropolitan's system. During periods of low deliveries from the West Branch of the SWP, or when the Jensen plant is out of service, the west area can be served by the Weymouth plant through the East Valley Feeder and the Greg Avenue Pump Station. This backup system is limited to a maximum capacity of approximately 50 cubic feet per second (cfs). Throughout the recent statewide drought that ended in early 2023, the Greg Avenue Pump Station operated nearly full-time at its maximum capacity.

In February 2022, Metropolitan's Board approved planning efforts for the Sepulveda Feeder Pump Stations Project to increase delivery reliability in the west area. This project will enable Metropolitan to convey treated CRA and DVL water from its Central Pool northward along the Sepulveda Feeder to the west service area, supplementing deliveries from the Greg Avenue Pump Station. This concept requires two new pump stations along the Sepulveda Feeder: one each located adjacent to the existing Venice and Sepulveda Canyon Pressure Control Facilities. The project will be implemented in multiple stages. The initial stage of the project includes the construction of two pump stations capable of moving up to 30 cfs northward from the Central Pool to the west service area. However, once operational, the water supply benefits of the project to the west service area will total approximately 60 cfs of water supply as there will no longer be a need to send approximately 30 cfs of "operational water" southward on the Sepulveda Feeder from the Jensen plant during periods of low SWP demands. These operational water flows in the Sepulveda Feeder are currently necessary to maintain water quality during low SWP allocations. Therefore, once the initial phase of this project is complete, the operational flows from the Jensen plant into the Sepulveda Feeder can be diverted to the west service area.

The pump stations will not only enhance the reliability of water supplies in the west area in times of reduced SWP supplies, but they will increase overall system flexibility by enabling the Jensen exclusive area to receive flows when the Jensen plant is removed from service for maintenance and repairs. During the upcoming rehabilitation of prestressed concrete cylinder pipe (PCCP) portions of the Sepulveda Feeder, the pump stations will also aid in minimizing delivery impacts to member agencies as the PCCP lining work proceeds.

In September 2023, the Board authorized an agreement with J.F. Shea to begin Phase 1 of the PDB process. The agreement permits J.F. Shea, upon Metropolitan's approval, to commence procurement of required equipment during Phase 1, prior to agreement on the GMP. The design has progressed to a point where early work packages have been developed, and staff recommends procuring long-lead electrical transformers at this time to meet a planned 2026 shutdown. Since the not-to-exceed amount in the agreement does not include this equipment, an amendment to increase the existing not-to-exceed amount is necessary to allow for the procurement of equipment. It is anticipated that staff will return to the Board in late 2024 for additional amendments to the agreement to cover procurement of additional long-lead equipment and Phase 2 work, which includes completion of design and construction.

Sepulveda Feeder Pump Stations – PDB Phase 1 Agreement Amendment (J.F. Shea Construction Inc.)

The amended PDB agreement will enable J.F. Shea to procure electrical transformers for the two new pump stations at the Venice and Sepulveda Canyon PCS sites. These long-lead items can take up to 18 months to procure, and staff recommends procurement of this equipment at this time. J.F. Shea will lead the procurement effort, utilize a best-value competitive process to select the vendor, and store the equipment until needed for the Phase 2 construction work.

A total of \$690,000 is allocated for this work. In addition to the agreement amendment amount, allocated funds include the following for Metropolitan staff: \$24,000 for submittals review, technical support, and responding to manufacturer requests for information; and \$66,000 for contract administration and project management.

Attachment 1 provides the allocation of the required funds. The total estimated cost to complete the work, including the amount appropriated to date, funds allocated for the work described in this action, and future construction costs, is anticipated to range from \$105 million to \$115 million.

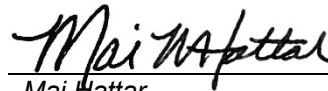
Proceeding with early procurement of the long-lead equipment at this time will enable the completion of the pump stations at the Venice and Sepulveda Canyon sites during a planned 2026 shutdown of the Sepulveda Feeder. This action authorizes a \$600,000 increase to an existing agreement with J.F. Shea for a new not-to-exceed amount of \$10.4 million to purchase long-lead equipment for the Sepulveda Feeder Pump Stations Project.

Project Milestones

November 2024 – Board award of a Phase 2 agreement for PDB services

December 2025 – Delivery of equipment

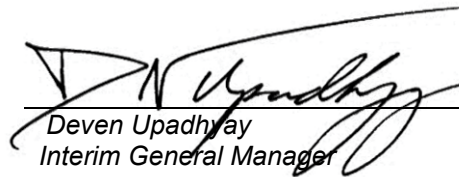
July 2026 – Completion of construction



Mai Hattar
Interim Chief Engineer
Engineering Services

6/24/2024

Date



Deven Upadhyay
Interim General Manager

6/27/2024

Date

Attachment 1 – Allocation of Funds

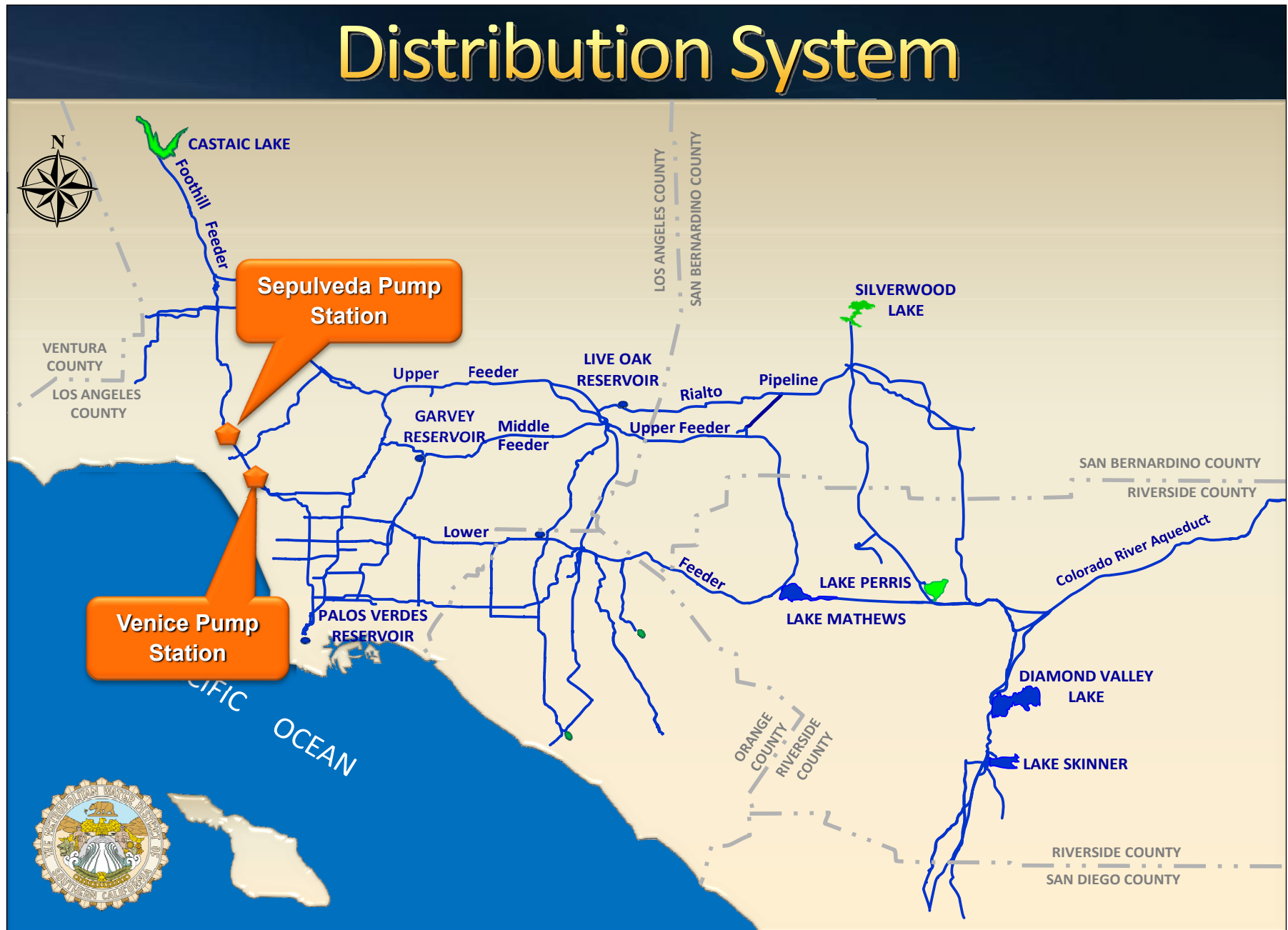
Attachment 2 – Location Map

Ref# es12700876

Allocation of Funds for Sepulveda Feeder Pump Stations

	Current Board Action (July 2024)
Labor	
Studies & Investigations	\$ -
Final Design	
Owner Costs (Program mgmt.)	66,000
Submittals Review & Record Drwgs.	24,000
Construction Inspection & Support	-
Metropolitan Force Construction	-
Materials & Supplies	-
Incidental Expenses	-
Professional/Technical Services	-
Right-of-Way	-
Equipment Use	-
Contracts	-
J.F. Shea Construction Inc.	600,000
Remaining Budget	-
Total	\$ 690,000

The amount expended to date on the Sepulveda Feeder Pump Stations project is approximately \$4.5 million. The total estimated cost to complete this project, including the funds allocated for the work described in this action is anticipated to range from \$105 million to \$115 million.





Engineering, Operations, & Technology Committee

Sepulveda Feeder Pump Stations – Transformer Procurement

Item 8-1

July 8, 2024

Item 8-1

Sepulveda Feeder Pump Stations – Transformer Procurement

Subject

Authorize a \$600,000 increase to an existing agreement with J.F. Shea Construction Inc. for a new not-to-exceed amount of \$10.4 million to purchase long-lead equipment for the Sepulveda Feeder Pump Stations project. (This action is part of a series of projects that are being undertaken to improve the supply reliability for State Water Project dependent areas)

Purpose

Early procurement of the long-lead electrical transformers for the two new pump stations will expedite project completion

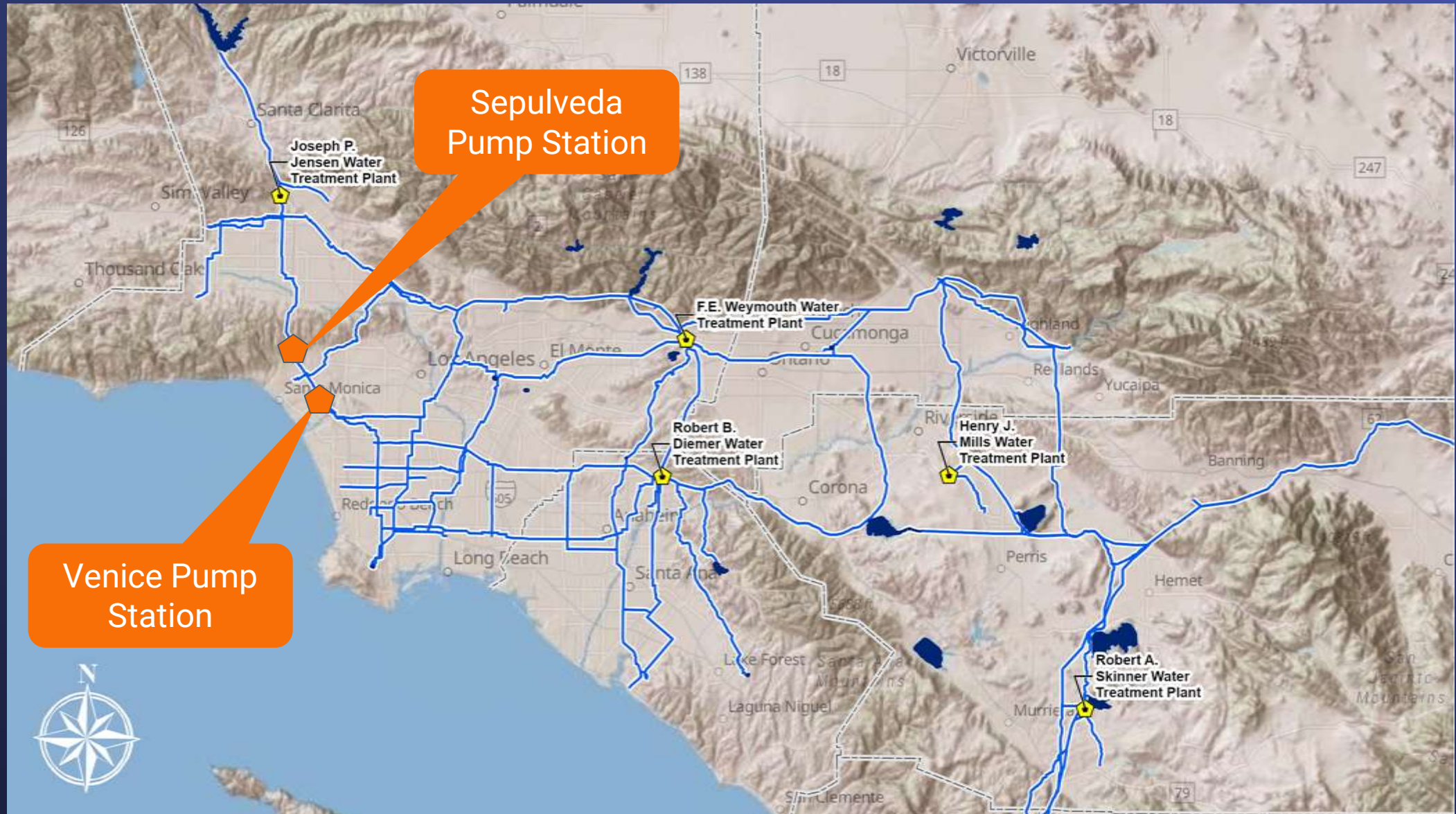
Recommendation and Fiscal Impact

Authorize an increase to an existing Progressive Design Build agreement for the Sepulveda Feeder Pump Stations project

Fiscal Impact of \$690,000

Budgeted

Location Map



Pumping Water Up the Sepulveda Feeder Enhances Drought Resiliency



Sepulveda Feeder Pump Stations Transformer Procurement



Sepulveda Pump Station Layout Rendering

Background

- Addition of pump stations at Sepulveda Canyon & Venice Pressure Control Facilities will allow Metropolitan to reverse normal flow in the Sepulveda Feeder
- Augments treated water deliveries to west service area
- Initial hydraulic capacity of pump stations of 30 cfs
- Offsets 60 cfs of State Water Project (SWP) usage

Progressive Design Build

- Owner has a single contract with the Design-Build firm
- Progressive Design Build (PDB) model utilizes a two-phase process
 - Phase 1: Design-Builder will progress the design collaboratively with Metropolitan to about 70% complete & propose a Guaranteed Maximum Price (GMP)
 - Phase 2: Once GMP is negotiated & upon board approval, Design-Builder will complete design & begin construction

Project Scope

- Two new pumping plants on the Sepulveda Feeder
- Project components
 - Pumps, motors, & interconnection piping
 - Valve structures
 - Mechanical eqpt. for surge protection
 - Electrical modifications & switchgear
 - Electrical & control buildings
- Lead time for electrical transformers can take up to 2.5 years



Proposed Electrical Room at Sepulveda



Venice Pump Station Layout Rendering

Sepulveda Feeder Pump Stations Transformer Procurement

Alternatives Considered

- Traditional procurement by Metropolitan staff
 - Competitive bidding would delay completion of project by up to two years
- Wait until GMP is established before starting procurement
 - Delays project completion

Sepulveda Feeder Pump Stations Transformer Procurement

Selected Alternative

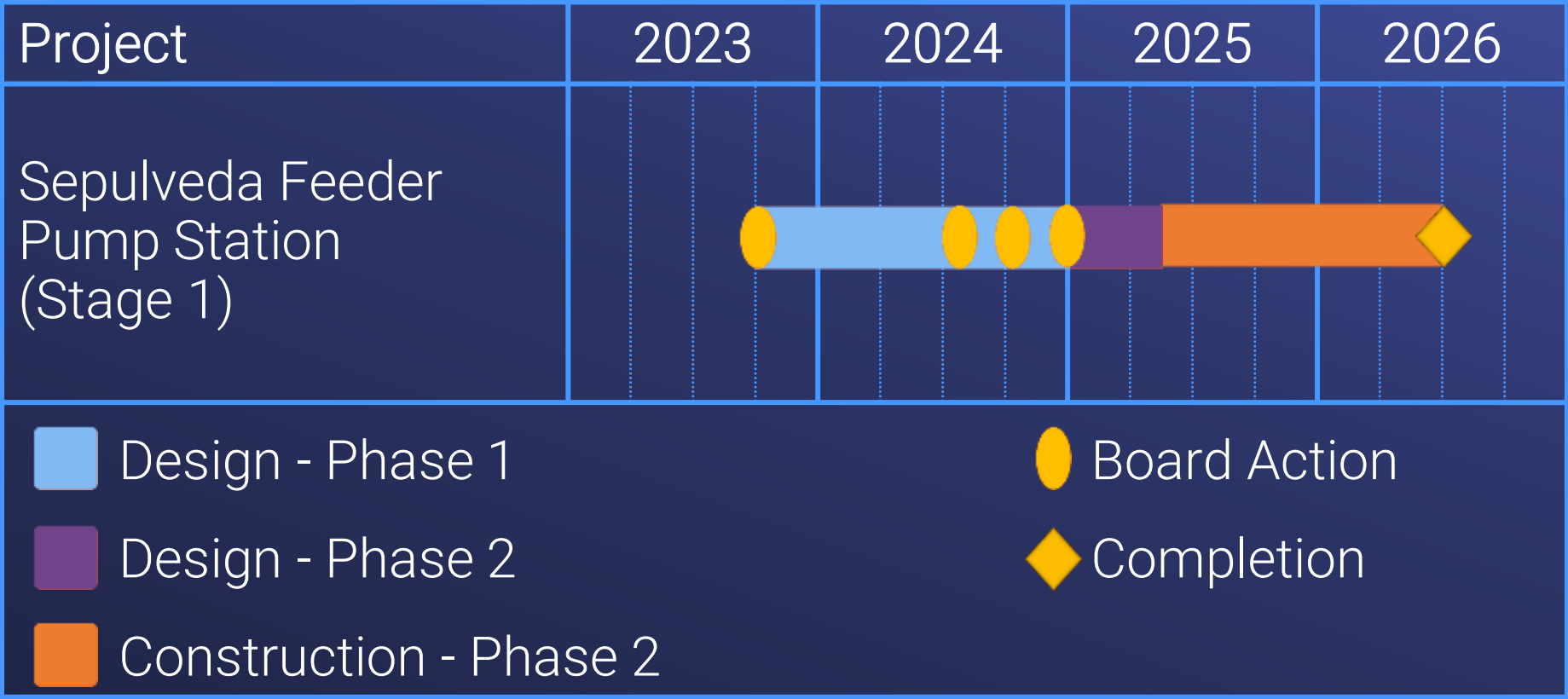
- Selected Alternative - PDB Contractor procurement of long lead equipment
 - Agreement permits PDB contractor, upon Metropolitan's approval, to commence procurement of required equipment during Phase 1, prior to agreement on the GMP
 - PDB contractor procures equipment directly on a best-value basis
 - Received six bids total
- Early procurement expedites project schedule

Allocation of Funds

Sepulveda Feeder Pump Stations

Metropolitan Labor		
Owner Costs (Proj. Mgmt., Contract Admin., Envir. Support)	\$	66,000
Submittals Review, Tech. Support		24,000
Contracts		
J.F. Shea Construction Inc.		600,000
Total		\$ 690,000

Project Schedule



Board Options

- Option #1

Authorize a \$600,000 increase to an existing design-build services agreement with J.F. Shea Construction Inc. for a new not-to-exceed amount of \$10.4 million to purchase long-lead equipment for the Sepulveda Feeder Pump Stations Project.

- Option #2

Do not proceed with the procurement at this time.

Staff Recommendation

- Option #1





THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Board Report

Integrated Operations, Planning, and Support Services Group

- **Colorado River Housing Community Planning Update**

Summary

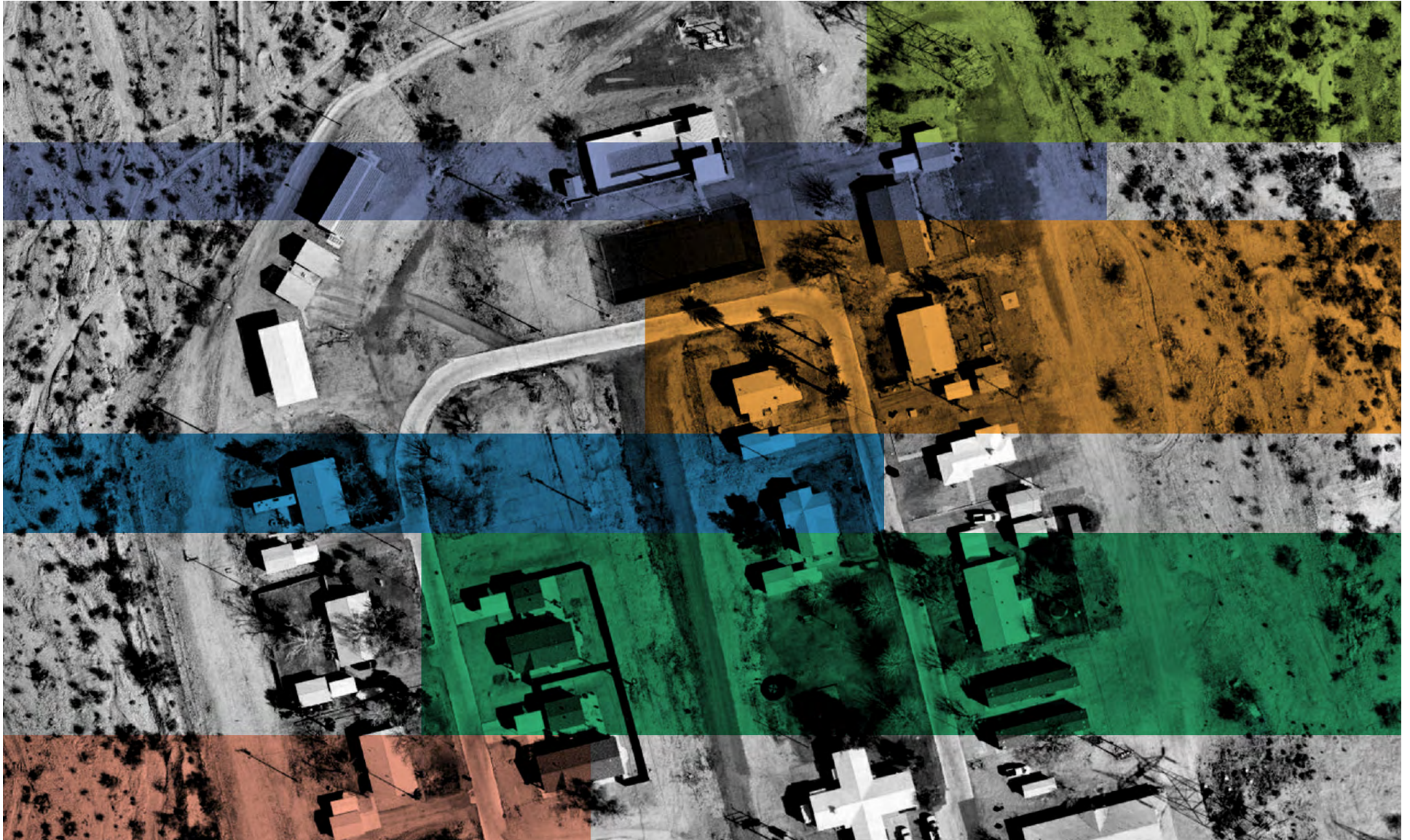
This is an informational update to provide the final report from the community planner on the District Housing & Property Improvements Program at the Desert Facilities. During the summer of 2023, Metropolitan hired a community planner to explore the long-term housing strategy to help create a vibrant, healthy, and sustainable community that will attract and retain the current and future generations of employees working and living at Metropolitan's five Colorado River Aqueduct pumping plants. Through an extensive iterative process over nine months, the consultant team has completed the community planning effort, and their recommendations are included in the attached report. Staff plans to review these recommendations in detail and return to the Board at a later date with final staff recommendations and next steps.

Purpose

Informational

Attachments

Community Planning Study Report



COMMUNITY PLANNING STUDY

MWD Housing & Property Improvements Program At The Desert Facilities



CIVITAS

EXECUTIVE SUMMARY

PURPOSE OF STUDY

Metropolitan Water District (MWD) has initiated a long-term housing program to evaluate the current and future needs of the Desert workforce housing. The study analyzes how best to support a remote workforce at Metropolitan's five Desert pumping plants at Hinds, Eagle Mountain, Iron Mountain, Gene, and Intake. Primary themes that were considered include the best way to support employee well-being through better work-life balance, whether villages should continue to support families, as well as Metropolitan's mission to deliver water in a fiscally responsible manner. As MWD considers how to attract and retain the current and future generation of desert employees, this study explores what the next 75 years of living and working in the remote villages and pumping plants will be. The outcome of this process is a recommended philosophical shift regarding Metropolitan's approach to workforce housing and employee support at these remote facilities.

BACKGROUND

Metropolitan owns five pumping plants located along the Colorado River Aqueduct at Intake, Gene, Iron Mountain, Eagle Mountain, and Hinds. Due to the sparse availability of community resources in the desert region and long commute times from the nearest cities at the time the pumping plants were built, Metropolitan developed employee villages adjacent to each pumping plant. The original housing is aging and needs to be either rehabilitated or replaced in the near future. A 2022 study was performed to determine the costs to replace all housing at the pumping plants. That study estimated the cost to replace all housing with new three-bedroom, two-bath housing, new kitchen and lodge facilities at two pumping plants and an amenities package at four facilities (Hinds, Eagle Mtn., Iron Mtn., and Gene) at \$190 million dollars. In the spring of 2023, Executive Management decided to pause the construction and engage in a community vision plan to explore the best long-term work-force housing strategy in the context of changing workforce, advancements in technology, and expansion of some adjacent Desert communities.

PROCESS

In the summer of 2023, Civitas and RNT Architects were selected to explore a long-term strategy for the Desert villages. The consultant team led an extensive outreach process that included visiting each village to listen and learn from current employees and having exploratory conversations with Executive and Desert Management regarding future housing and operations at the five pumping plants. The consultant team developed a series of village strategies that were vetted with leadership and the desert communities through an iterative process. Feedback from the communities was received through a second round of in-person discussions and an anonymous online survey. This report summarizes the outreach, understanding, and recommendations that came out of this process.

KEY COMMUNITY TAKEAWAYS

- Compensation and benefits were the most significant factor in new employee recruitment and retention.
- Housing plays an important role in decision to work at Metropolitan.
- A significant portion of the current workforce likes their single family homes as it allows the option for families to live there or visit during extended work shifts (holidays, covering vacation, on-call).
- The sense of community and ability to have family present in villages is valued for personal mental health.
- Future generations may be accepting of alternative housing types, including townhomes, if combined with other benefits.
- Employees understand the need and logic behind consolidating villages but are also strong advocates for future generations of desert employees.

GUIDING PRINCIPLES

- Support the long-term operation of the Colorado River Aqueduct (CRA) system.
- Create a financially resilient and socially sustainable 75-year housing strategy.
- Provide standard of living that supports employee recruitment, retention, and satisfaction.
- Create safe and healthy villages that contribute to the mental well-being for current and future workforce.
- Introduce new housing strategies, but remain flexible to ever changing market conditions.
- Maintain current housing for all current employees.

PREFERRED VILLAGE STRATEGY

The consultant team tested and vetted over a dozen different Desert village strategies with Executive Management, Desert Management, Labor leadership and Desert employees. The proposed strategy anticipates striking a balance between providing a housing strategy and village environment that will continue to attract and retain talent necessary to run the pumping plants, while also being fiscally responsible both near- and long-term.

A Pilot Program has been identified as part of a phased approach to implementation, that will allow MWD to test the new housing strategy and make informed decisions at each subsequent implementation phase through the program's completion.

The preferred desert housing strategy 1) maintains current housing for existing employees at all current plants and villages; 2) consolidates villages to increase amenity offerings while decreasing overall costs; 3) initiates a pilot program

to introduce and test new housing models; 4) provides commercial kitchens, hotel lodges, and upgraded amenity packages during the first phase; 5) provides a phased approach that is trigger based, relying on regular review and assessment over a 15-year build-out timeline that allows flexibility to adapt to changing market conditions.

The recommended strategy is to focus resources on the two most remote villages, Eagle Mountain and Iron Mountain as well as Gene pumping plant during the first five years. After year 5, there is flexibility to either maintain or scale-back Gene as a remote desert village after the Phase 1 pilot project. This philosophy extends from the following critical observations:

- Gene and Hinds are no longer 'remote desert villages' as Lake Havasu, Parker, and Indio have grown into fully operational communities over the past 75 years, and are anticipated to continue to grow. These towns are within reasonable commuting distances from Gene and Hinds pumping plants.
- Eagle Mtn. and Iron Mtn. are the most isolated and include the Pump Maintenance Team and O&M Team, respectfully, in addition to the Pumping Plant, that would be costly and inefficient to relocate.
- Hinds should be combined with Eagle Mtn. to consolidate amenities, resources, and create a critical mass for a sense of community at Eagle Mtn. Hinds will operate as a 'satellite pumping plant' that includes hotel style housing and minimal amenities to support employees who are on stand-by. Employees will commute to Hinds from Eagle Mtn. daily.

In addition, Intake pumping plant is uniquely positioned to provide staff amenities due to its location on Lake Havasu and its significance as the beginning of the CRA. Currently, on-call response at Intake relies on a two-lane road that serves employees commuting from Gene. Therefore, program to be considered for Intake includes short term housing, vacation rental homes, and a conference room. This program is flexible and will be refined in subsequent phases based on MWD priorities and constraints of this site.

CONCLUSION

Executive Management's decision, in the spring of 2023, to pause construction and engage in a community vision plan to explore the best long-term work-force housing strategy resulted in a cost benefit. The recommended housing and amenity packages aim to foster a better work-life balance for future employees, while providing a good value to Metropolitan, its employees, and ratepayers, due to the increased efficiency of Desert workforce housing, a focus on amenities that matter to employees, and its adaptability to future conditions. This preferred approach for Desert workforce housing outlined in this report is \$145.6 million (2024 dollars) and offers a cost savings in comparison to the 2022 approach which was estimated at \$190 million (in 2022 dollars).

Depending on the eventual mix of townhomes and single-family housing at each pumping plant (Eagle Mtn., Iron Mtn., and Gene), the anticipated project cost ranges from \$145.6 million (all townhomes) to \$249 million (all single-family homes) in 2024 dollars; not including site prep, site improvements, mechanical and electrical utilities, survey, and escalation.

MWD should use a phased approach, based upon triggers, that will allow MWD to move towards a fully supported townhome village model at Eagle Mtn., Iron Mtn., and Gene. The phased approach is envisioned as four phases over a period of 15 years, which will allow MWD to test the acceptance of a townhome housing model* with new employees while allowing for the decommissioning of single-family housing coinciding with retirement of current workforce. Phase 1 investments are spread over a 5-year period and include upgraded amenity packages and strategically located one-bedroom townhome pilot projects at Eagle Mtn., Iron Mtn., and Gene. The range of amenities and investments identified for each village represent long-term usable investments regardless of which village build-out strategy is ultimately chosen. The opinion of probable cost, across all villages, for Phase 1 is approximately \$82 million dollars (2024 dollars). This opinion of probable cost does not include site prep, site improvements, mechanical and electrical utilities, survey, and escalation which is estimated at about \$21 million (2024 dollars) across all villages. Site improvement estimates are variable depending on coordination with on-going infrastructure updates.

Opinion of Probable Costs of Preferred Strategy

■ Phase 1	81.9M
■ Phase 2	24.7M
■ Phase 3	28.2 M
■ Phase 4	10.8M
■ Total:	145.6M

Phase 1 Includes the following:

- Construction of twenty-four, one-bedroom townhomes distributed among Eagle Mtn., Iron Mtn., and Gene pump plants.
- Construction of 56 short-term hotels for temporary workers distributed among Eagle Mtn., Iron Mtn., and Gene pump plants.
- Short-term hotel at Hinds to support 'stand-by' plant team members.
- New or upgraded kitchens at Eagle Mtn., Iron Mtn., and Gene.
- Upgrade village amenity package at Eagle Mtn., and Iron Mtn.

NEXT STEPS

- Provide staff recommendation to the Board.
- Proceed with preliminary design for Phase I which includes space allocation and phasing strategy

LONGTERM PLANNING

1. Determine if consolidating villages is appropriate based on the pilot results.
2. Confirm recommended long-term phasing and investment strategy.
3. Create a review committee to assess the success of the Townhome Pilot Program (Phase I). The committee to include union and employee participation.
4. Evaluate current capital improvement program against preferred village strategy.
5. Develop transition plan to relocate Hinds employees to Eagle Mountain.

* The townhome housing model is a cluster of one-bedroom apartments located on a single lot with shared walls. Each unit is dedicated to one employee and has a front door to the outside.

Notes:

1. Intake will include a 800 sq. ft. conference room estimated at +/- \$750,000.
2. Includes 10% housing increase across all villages and scenarios
3. These cost estimates do not include the estimated site improvement costs, which is about \$21 million across all villages for complete build out. Final site improvements cost is variable depending on coordination with on-going infrastructure updates.



Community Planning Study

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PROJECT PURPOSE

For over 75 years, the Metropolitan Water District of Southern California (MWD) has been bringing water to the greater parts of Southern California. The most critical components of this process are the pumping plants along the Colorado River Aqueduct (CRA) and their respective employees that have been housed on-site in villages for generations. In days past, these sites were thriving communities that were the permanent homes for employees and their families. These remote communities were places that employees wanted to live and create a life.

However, over the years, the way people work and where they choose to live has evolved. Desert communities of Indio, Parker, and Lake Havasu have grown in population and provide all lifestyle amenities (schools, grocery stores, medical facilities, and entertainment) that once had to be provided by the MWD Pumping Plant Villages. As the communities have shifted, more employees choose to maintain permanent residences in these adjacent communities or elsewhere. As such, the sense of community and quality of lifestyle at the pumping plants has changed, and the residential and amenity facilities have aged and become less desirable to employees and their families. In response, MWD is considering a new approach to housing and facilities at these plants and villages. As MWD prioritizes the development of quality communities for the next generation of employees, management is looking beyond near-term repairs and is considering the next 75 years of employment in the remote pumping plants of the Desert. While salary and benefits packages are an important factor, today's employees are making decisions more holistically, considering the quality of work-life balance.

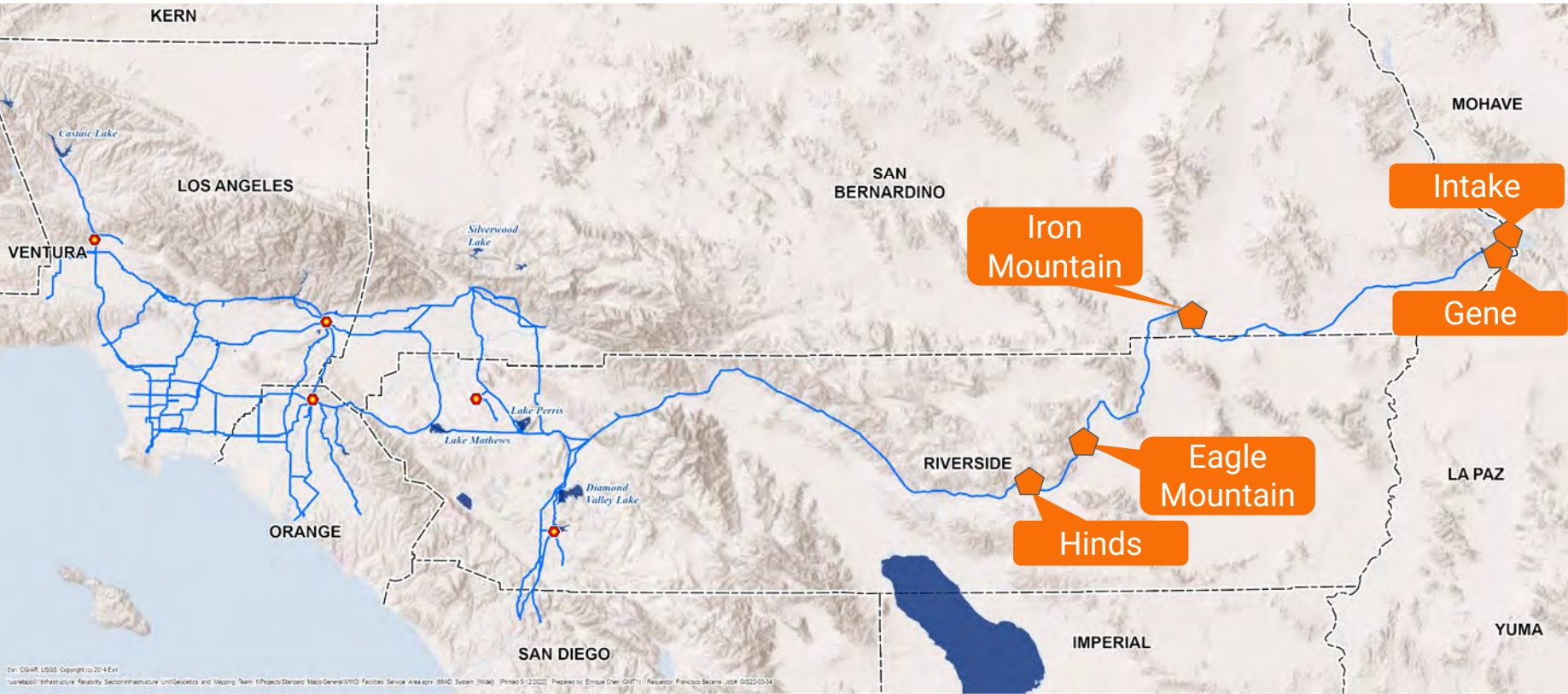
Key considerations include:

- The right housing and amenity package that will attract the next generation of employees at these remote desert sites
- Whether the next generation of employees want to live and work at these facilities
- The type of environment and housing model that will enable employees to thrive during work shifts and enjoy life outside of work hours
- Validation of previous work and discovering areas requiring refinement, or establishing a new direction for future desert workforce housing
- The long term environmental, social, and fiscal resiliency of Desert villages

*"So to all who have helped in its building,
In places if great or if small;
There is more than the wage collected;
There's glory for each and for all.*

*And may millions partaking of blessings
To their lives the Aqueduct brings,
Give sometimes a thought to its builders
And a toast, as onward Time swings!*

"The Honor Roll"
The Aqueduct: Tunnel, Camp, and Trail
by Charles F. Thomas, Jr.

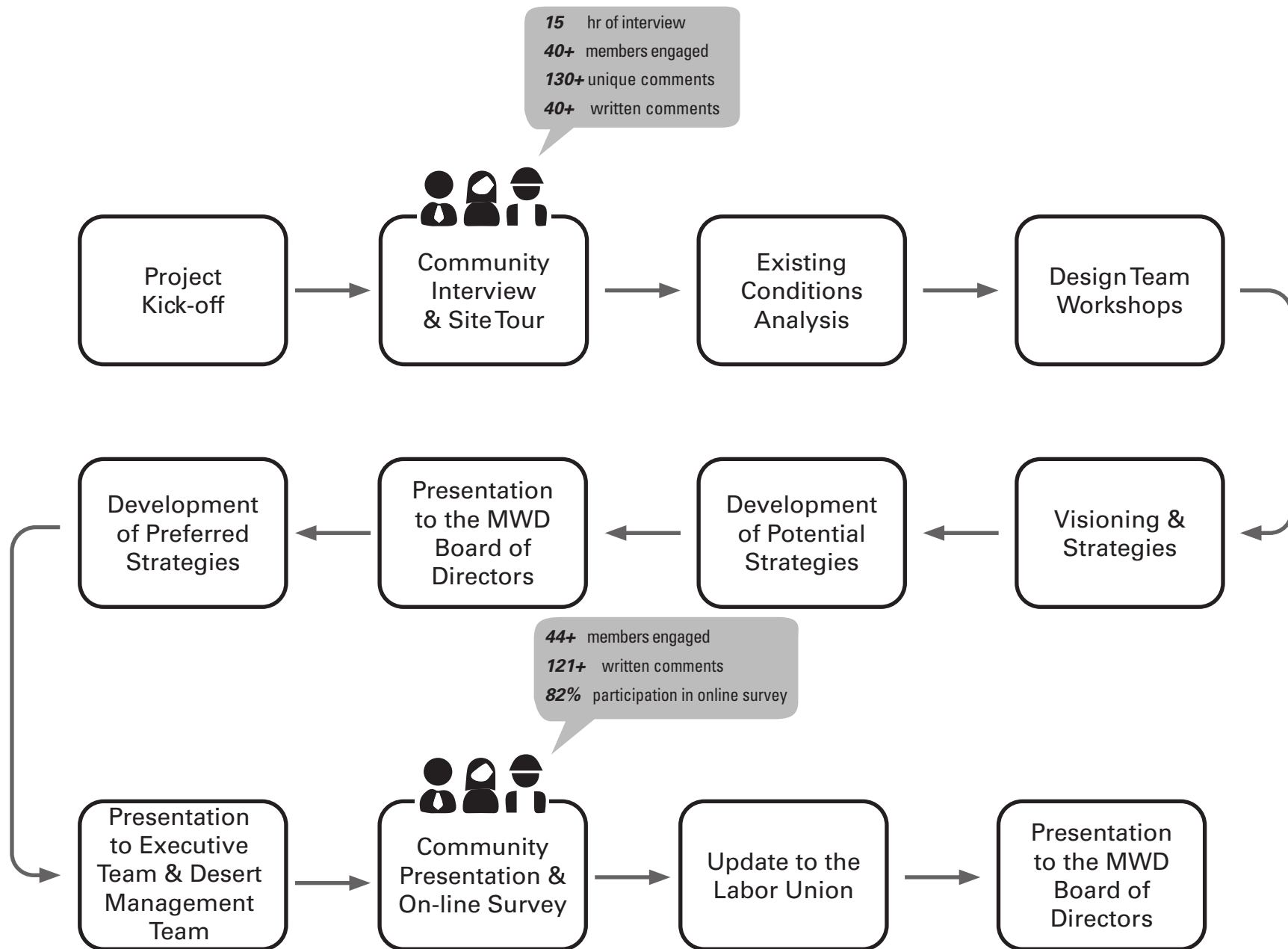


2 METHODOLOGY

The consultant team engaged in a robust community and management outreach process that included multiple site visits, hours of community listening sessions, and analysis of the physical attributes of each pumping plant village. Through numerous, in-depth conversations with employees and Desert Management, the consultant team was able to garner a sound understanding of how pumping plant teams and support teams operate in the Desert villages; what's working and what's not working; the hopes, concerns, and desires from the perspectives of various stakeholder groups (employees, Labor management, Desert Management, and Executive Management). This insight allowed Civitas and RNT to conceptualize a range of potential Desert village and housing strategies that were debated and refined through an iterative process with the stakeholder groups.

This has led to the development of a preferred framework for how Desert villages may evolve over a fifteen year period allowing MWD to provide high quality employment, communities, and housing for the future generations of Desert employees. A conceptual phasing strategy has been created that will allow MWD to make fiscally responsible capital investments of new housing types and in long term villages over the course of 15 years. Strategic decisions points at years 5, 8, and 11 will allow MWD to evaluate progress and employee acceptance of a new desert housing typology and village organization strategy. Housing types for subsequent phases of construction will depend on which housing types have been most successful at attracting and retaining the skilled employees that MWD relies on for operating its desert pumping plants.





WHAT WE HEARD

MANAGEMENT PERSPECTIVE

The consultant team had multiple conversations and touchpoints with Executive Management, Desert Management, and Labor throughout the process. We identified common themes from these conversations that influenced our thinking about Desert villages strategies:

Lifestyle and Culture

Management recognizes that living and working in the desert environment is a challenging lifestyle and that the village strategy for the next 75 years needs to provide appropriate housing and amenity packages to support MWD employees and people who live there by providing a safe and healthy environment and creating opportunity for work-life balance.

Recruitment and Retention

Supporting the mission and function of the CRA is the critical role of MWD. To that end, recruiting and retaining talent will always be necessary. Management acknowledges the current employees' preference for single-family housing in the villages, but believe that employee-only housing with additional compensation is a strategy that may prove just as attractive to many potential employees. Management's goal to balance 1) near term construction costs; 2) long-term management and maintenance costs of operating four remote, family-centric villages; 3) navigate a cultural shift towards more work-life balance, has led to a workforce housing strategy and amenity package designed to support pumping plant operators and support crews while they are living on-site during work shift.

All current employee housing arrangements are grandfathered in and will remain as is. All current employees will not be required to move into the new townhome housing model; however, there may be an opportunity for current employees to opt into a new housing/compensation package.

Housing

Management team would like a resilient village strategy that is adaptable to future workforce housing and lifestyle needs. There is recognition that future generations may not all want three-bedroom single family homes but would prefer smaller dwelling units (with less maintenance and yard responsibility) and a better amenity package. There is also a strong desire for MWD to move away from being the owner and manager of a single-family gated community. Migrating the villages to a townhome housing model focused on supporting the 'on-shift' workforce, rather than full-time families, will reduce the amount of time and money allocated to managing the community, thus allowing MWD to focus their efforts on their mission and strengths – operating the CRA.

VILLAGE RESIDENTS' PERSPECTIVE

Through extensive community conversations, discussions with union leaders, site visits and an anonymous survey, we identified common themes shared by village residents that has influenced our thinking about housing typologies and amenity packages:

Lifestyle and Culture

Many residents appreciate the small-town culture, safety and sense of community offered by the villages. The sense of community pride and camaraderie is strongest in Hinds, Eagle Mtn. and Iron Mtn. due to the remote lifestyle. A higher percentage of employees are full-time residents and have therefore created a stronger community network. This is visually evident in the upkeep of homes and yards, shared public spaces as well as the informal community events, and neighborly favors (maintaining yards, group dinners, bringing supplies from town, etc.). This exists less so at Gene because most employees have a primary residence outside of Gene camp.

Housing

There is a strong preference for single-family detached housing across all communities. A common theme is to have their 'own front door' and ability to 'go home' at the end of the work shift with emphasis placed on work/life balance and the need for personal space/physical separation from co-workers/managers when they are not working. There are mixed opinions about the maintenance and upkeep of homes. Some employees appreciate the back yards and personal space, while others lament the fact that they must maintain the property, the latter of which becomes an eyesore and issue of contention between employees who maintain the property and those who do not. There are also mixed opinions of having to furnish the home, while many employees are steadfast about continuing to be provided 3 bed/2 bath homes, there is a contingent who do not want to have to furnish the homes. The conversation about switching to a townhome model (i.e individual 1 bed/1 bath dwelling units with shared walls and individual front doors), was initially met with some resistance, but some residents warmed to the idea if this model was combined with upgraded amenities and compensation packages.

Shade for outdoor patio space and for parked vehicles is also a high priority and should be included in any housing scenario.

There is also much desire for physical separation between housing and pumping plant operations (pumping plant, electric yard, lay down area, fuel station, maintenance facilities, truck access, etc.). The physical design and programmatic organization of villages should be considered in the future to help create a physical separation between living areas and pumping plant operations.

Amenities

A common theme among the villages is that they would like the existing amenities upgraded (increased pool hours, separate dining hall and business meeting/training space, independent game room/community room, increased shade at outdoor spaces, separate work-out rooms for residents and outsiders, and upgraded air conditioning). The longer-term desires include providing more shade and beautification throughout the community along streets, creating more usable public spaces with shade and amenities, providing shade at pools for use during day and heated pools that allow use during evening hours after work shift, and providing consistent lighting on basketball and tennis courts. The idea of creating an indoor, climate-controlled field house that included large flexible turf area and/or gymnasium space was highly favored. This could be combined with locker room, weight room, community room and access to outdoor pool. Reliable Wi-Fi connectivity is also a highly requested amenity as bandwidth is not adequate in evening hours to support the villages.

Community Safety

Public safety is a primary concern at Hinds, Eagle Mtn., and Iron Mtn. All residents appreciate the sense of safety living in a secured community, but the remoteness and limited access to EMS/Fire/health care is a concern.

KEY TAKEAWAYS

- Enhanced villages are critical to attract and retain staffing at each facility (most if not all plants are currently understaffed due to difficulty in attracting qualified employees).
- Emphasize the need to create a welcoming environment and community spaces through shade trees and landscape at key locations to enhance employee comfort and mental health.
- Openness to modifying the current approach to shifts and staffing to facilitate alternative housing/village strategies.

3

GUIDING PRINCIPLES

SUPPORT THE LONG-TERM
OPERATION OF THE CRITICAL
CRA INFRASTRUCTURE

- Balance near-term investment with long-term economic resiliency, operational needs, maintenance requirements, and employee on-boarding costs.
- Consider anticipated changes and long-term needs for pump plant staff and operations.
- Design for adaptability and flexibility for the next 75 years of desert communities.

CREATE A FINANCIALLY
RESILIENT AND SOCIALLY
SUSTAINABLE 75-YEAR
STRATEGY

- Create village design tailored to remote desert location and climate.
- Utilize appropriate building technologies to support MWD's commitment to resiliency and sustainability.
- Develop a phased village build-out strategy that allows MWD to strategically invest in each village in a manner that has flexibility to adapt to future unknown needs.

PROVIDE STANDARD OF
LIVING THAT SUPPORTS
EMPLOYEE RECRUITMENT,
RETENTION, AND
SATISFACTION.

- Design villages to support the health and safety for employees and residents at each villages for the next generation.
- Offer a package of housing, amenities, services, and/or other benefits that will attract and retain high-quality employees.
- Create a community and sense of place that provides where employees unwind after a long day of work.
- Provide the right mix of amenities and flexibility for amenities to evolve with the interests of future generations

CREATE SAFE AND HEALTHY VILLAGES THAT CONTRIBUTE TO THE MENTAL WELL-BEING FOR CURRENT AND FUTURE WORKFORCE.



- Provide privacy for residents and separation between housing and pump plant operations.
- Provide opportunity for residents to build social connections and a sense of community.
- Enhance access to EMS/fire/safety resources to support remote living.
- Enable active living, stress reduction activities, and safe recreation opportunities.

INTRODUCE NEW HOUSING STRATEGIES, BUT REMAIN FLEXIBLE TO EVER CHANGING MARKET CONDITIONS.



- Housing typologies tailored to the needs of current and future full-time residents.
- Consider critical mass of residents necessary to create meaningful sense of community.
- Develop amenity packages are tailored to the number of residents in each village.

MAINTAIN CURRENT HOUSING FOR ALL CURRENT EMPLOYEES.



- Current residents to remain in their current home until they retire or voluntarily move into a different housing package.
- Create a strategic phasing plan that decommissions/demolishes oldest, unoccupied homes first.

LEGEND

The following legend introduces the icons used throughout the report and appendixes. This visual language is used to describe the different housing and amenities explored throughout the design process.



**STAND-BY
SATELLITE CAMP**
SHIFT HOUSING
(1-2 WEEKS)



**EXTENDED STAY
CAMP**
WORKFORCE HOUSING
(182 DAYS)

Primary Amenity Icons

The icons will represent conceptual housing and amenities throughout the report.



Descriptive Amenity Icons

Each primary amenity icon represents a variety of potential elements. See Appendix pg. 137 for full description of program elements.

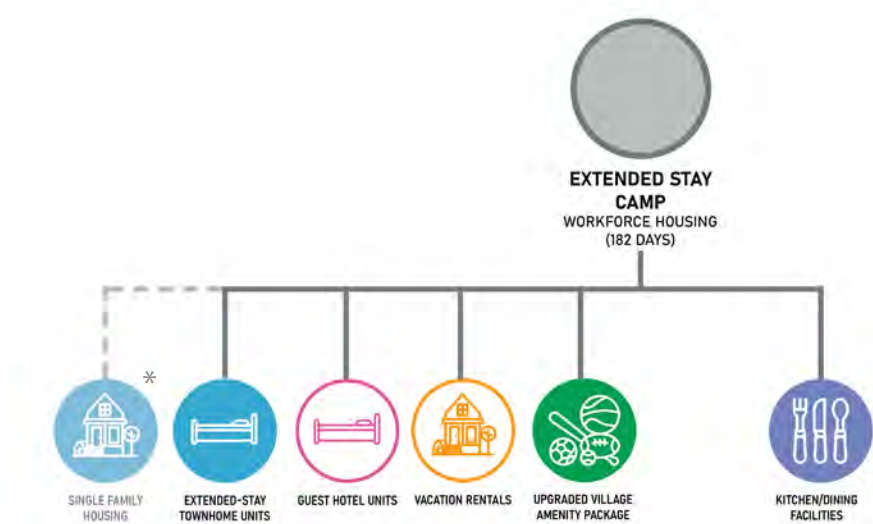


VILLAGE FRAMEWORKS

Extended-stay camp framework

Each desert employee will be provided their own personal living unit in the form of an extended-stay townhome which will be co-located with a robust amenity package at Eagle Mtn., Iron Mtn., or Gene.

The townhomes are intended to provide housing to MWD employees during their work shift.

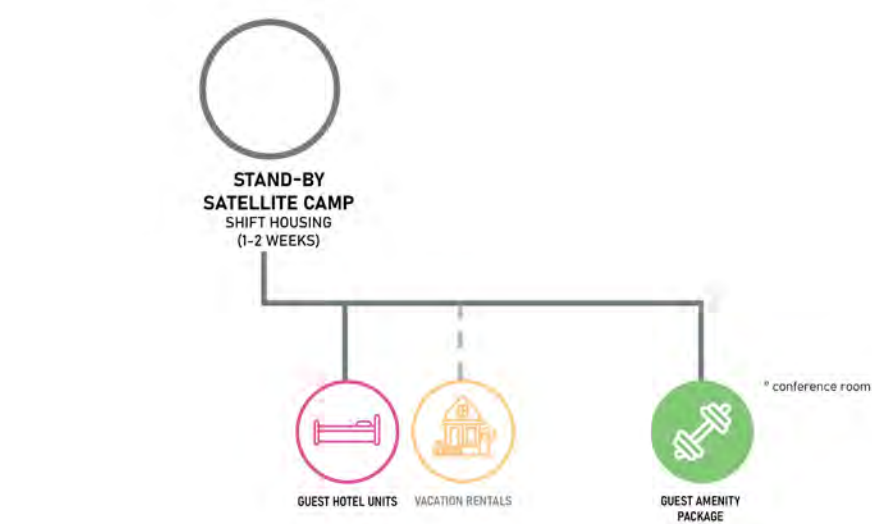


*Single family housing could be reincorporated should extended-stay townhomes not be desirable by employees


Standby satellite camp framework

Hinds and Intake pumping plants will operate as satellite camps where employees will temporarily stay on-site during stand-by. Extended-stay housing will be provided at adjacent consolidated village while employees are on-shift.


Intake will also include vacation rentals and a conference room in order to enjoy the proximity to Lake Havasu. Sewer system upgrades should be studied to understand feasibility.




HOUSING TYPOLOGIES




SINGLE FAMILY HOUSING
SINGLE FAMILY DETACHED WITH 2 CAR GARAGE




+/- 1,350 sq. ft.




EXTENDED-STAY TOWNHOME
MULTI-FAMILY HOUSING WITH INDIVIDUAL FRONT DOOR, 1BD W/ KITCHEN SUITE



+/- 750 sq. ft.





GUEST HOTEL
MOTEL ROOM



+/- 350 sq. ft.

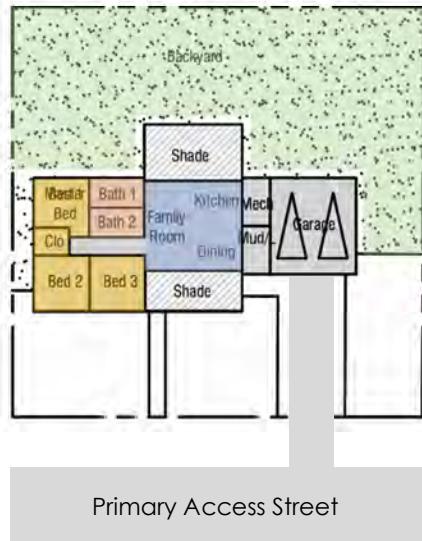
ALTERNATIVE EXTENDED-STAY HOUSING TYPES:

- 

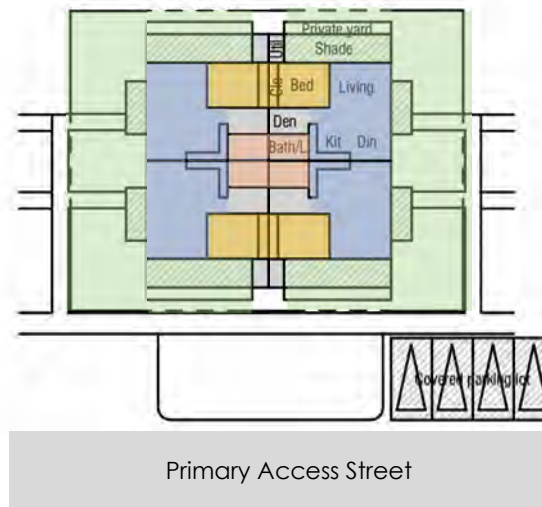
CASITA
- 

RV SITES W/HOOKUPS
USE OF PERSONAL RV'S FOR HOUSING

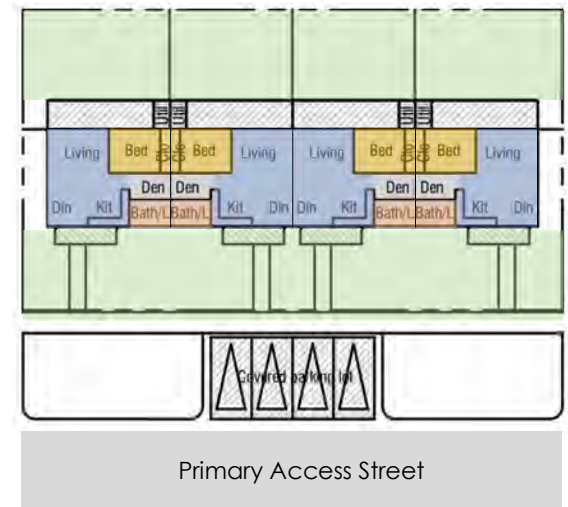
Single-family Homes



Extended-stay Townhome / Hotel (Pin-wheel type)



Extended-stay Townhome / Hotel (Linear type)



The extended-stay townhomes and hotels can be clustered with four units together in either a 'pin-wheel' or 'linear' manner. This can be done to fit future townhome products onto existing single family home lots.

PHASING PHILOSOPHY

Utilizing a phased investment approach will allow MWD to move towards the goal of a fully supported townhome village model at Eagle Mtn., Iron Mtn, and Gene.

The phased approach is envisioned as four phases over 15 years, with each subsequent phase of housing development based upon analysis of the prior phase. It is recommended that reassessment will occur after each phase, allowing MWD to make informed decisions as to whether they should continue to build townhomes or implement some mix of townhomes, casitas, and single-family homes based upon employee feedback. This phased approach will also provide a staggered expenditure plan to Metropolitan's budget, thus, meeting its fiduciary responsibility to renovate villages in a financially responsible manner.

A conceptual phasing strategy has been developed that can be applied simultaneously to Eagle Mtn., Iron Mtn, and Gene. The strategy allows for a Pilot townhome housing typology to be constructed in each of the villages during year one and evaluated over the first five years. This will allow MWD to test and evaluate acceptance of the townhome housing type with new employees while simultaneously allowing for the decommission of single-family housing coinciding with retirement of current workforce. Phase 1 will also include necessary guest hotels, village amenities, new/upgraded commercial kitchens and vacation rental housing. All capital investments identified for Phase 1 represent long-term, permanent investments in each village regardless of the ultimate determination of housing product mix.

Figure 1 represents a hypothetical phased approach at Iron Mountain to convey how a phased strategy can be applied to each village. It is anticipated that all current employees will remain in their current housing with currently scheduled upgrades. New facilities will include: eight extended stay townhomes, twenty-

five guest hotel rooms, two vacation rentals, one village amenity and new commercial kitchen. After year five, MWD will assess the community design strategy and acceptance of townhome housing model. At this point in time MWD can modify the number and type of housing constructed in later phases based upon employee and management feedback, pivoting in the build-out strategy to either 1) Continue build-out to all extended stay townhomes; 2) introduce a mix of single family/casita/townhome housing units to better align with employee recruiting/retention needs; 3) If the townhome model is deemed unsuccessful, MWD can revert back to build-out of all single-family homes. In this scenario, the initial townhomes built in Phase 1 will be converted to short-term guest hotels to meet future hotel needs. A conceptual phased approach is outline below with the goal of completing each village build-out within 15 years.

PHASE 1 (YEAR 1-5) :

Pilot Program, assess and evaluate annually, modify plan in Phase 2

PHASE 2 (YEAR 6-9):

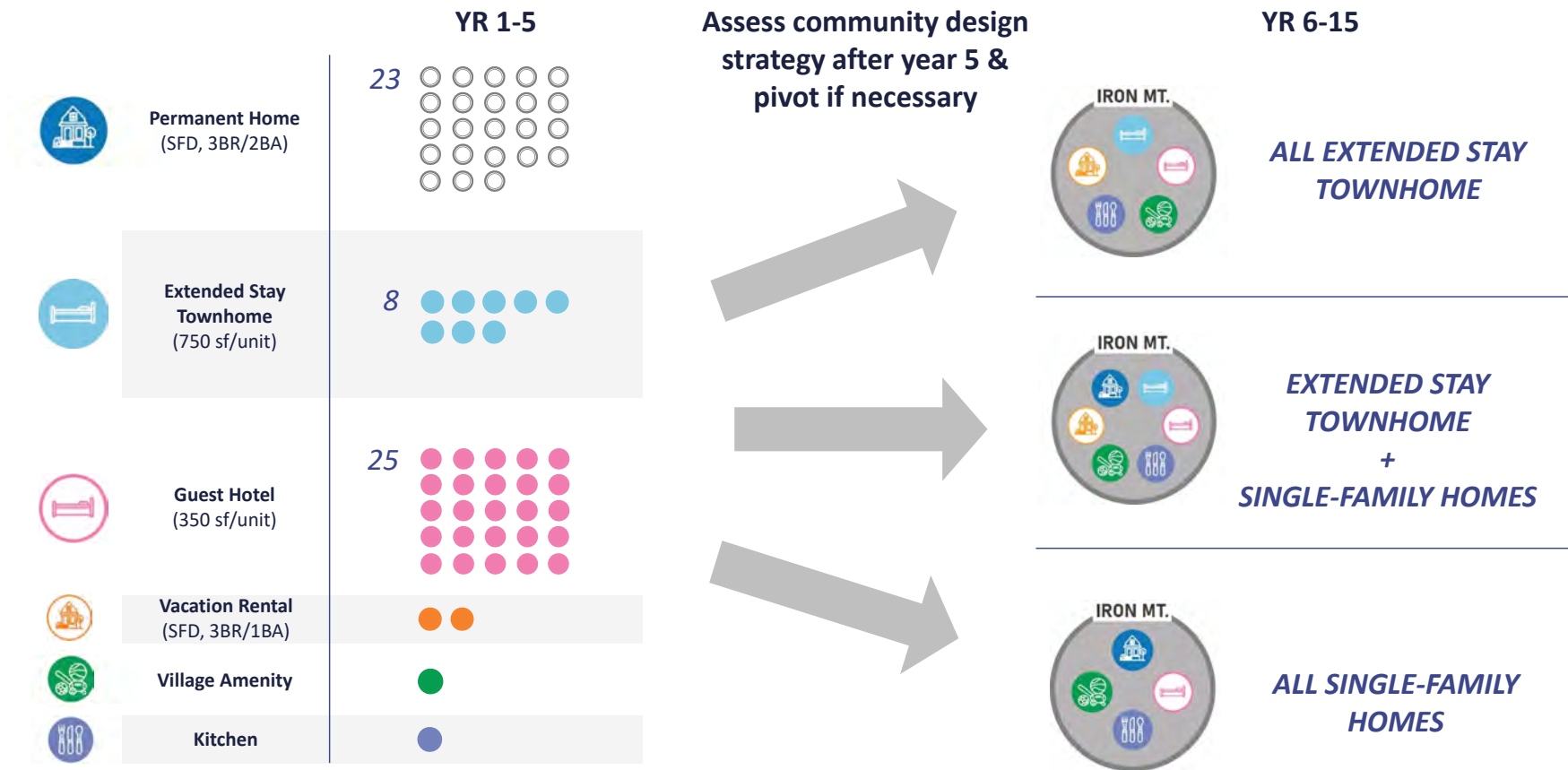
Assess and evaluate at year 9, modify housing program as necessary in Phase 3

PHASE 3 (YEAR 10-12):

Assess and evaluate at year 12, modify housing program as necessary in Phase 4.

PHASE 4 (YEAR 13-15):

Complete Build-Out



Phase 1 includes the following:

- Pilot program to test 1-bedroom townhomes at Eagle Mtn., Iron Mtn., and Gene.
- Short-term hotels for temporary workers at Eagle Mtn, Iron Mtn., and Gene Village.
- Short-term hotel at Hinds and Intake to support 'stand-by' plant team members.
- New or upgraded kitchens at Eagle Mtn., Iron Mtn., and Gene.
- Upgrade village amenity package at Eagle Mtn. and Iron Mtn.

FIGURE 1

See appendix pg. 100 for a detailed phasing strategy that demonstrates how each village could be phased to accommodate a range of options from all extended-stay townhomes to all single family homes.

RECOMMENDED STRATEGY

The recommended strategy for the next 75 years at Metropolitan Water District is to provide three fully supported villages at Eagle Mtn., Iron Mtn., and Gene utilizing the extended-stay townhome housing typology for future employee housing.

The intent of these villages is for employees to live on-site during their work shift in their own personal housing unit with an upgraded amenity package. Meal plans and housekeeping may be considered as added benefits for recruiting and retaining future employees living in smaller housing units. Three-bedroom/2-bathroom homes will be provided as vacation rentals at each village to allow for families of employees to temporarily stay in the village while employees need to be on-site for extended periods of time and/or are on-shift during holiday hours.

Eagle Mtn. and Iron Mtn., which include the Pump Maintenance Team and the O&M Team, are the most remote villages and have the greatest difficulty with recruitment and retention of employees. Therefore, MWD should focus resources and energy on these villages to create highly amenitized 'oases' for employees while on shift. In order to create a critical mass of people living on-site and co-locate employees with significant investment in upgraded amenity packages, Hinds Pump plant employee housing will be relocated to Eagle Mtn. village with employees commuting to Hinds Pump plants on a daily basis.

Hinds and Intake will function as 'standby satellite camps' providing a limited number of studio hotel units and a scaled back amenity package intended to support only those employees staying on-site temporarily to fulfill the 'stand-by' requirement of 15-minute response time. Intake will also include vacation rentals and a conference room in order to take advantage of its proximity to Lake Havasu as an amenity.







The diagram to the right depicts all future housing and program amenities at each of pump plant.

Note: Gene is included in this strategy as a fully operational village since it has historically operated as the 'main desert village'. However, in the past 75 years, Lake Havasu City and Parker have evolved into fully functioning towns offering all the services desired by families. In addition, many Gene/Intake employees rarely live at Gene village unless fulfilling 'stand-by' requirements. Therefore, there may be a scenario where Gene is no longer considered a village offering full-time housing and upgraded amenity package, which would lead to additional cost savings.

THREE DESERT VILLAGES

100% EXTENDED-STAY
TOWNHOMES
105 HOUSING UNITS



TOTAL COST		COST PER VILLAGE				
\$ 145.6M		\$2.4M	\$44.6M	\$45.4M	\$45.3M	\$7.9M
SUMMARY OF HOUSING AND AMENITIES						
 Single Family Homes	0	-	-	-	-	-
 Extended Stay Townhomes 750 sq. ft.	105	-	35	33	37	-
 Vacation Rental	12	-	3	3	3	3
 Guest Hotel 350 sq. ft.	64	3	17	25	15	4
 Upgraded Amenities	3	-	1	1	1	-
 Guest Amenity	2	1	-	-	-	1 ^o
 Kitchen	3	-	1	1	1	-

^o Intake will include a 800 sq. ft. conference room estimated at +/- \$750,000.

*10% housing increase across all villages and scenarios

** These cost estimates do not include the estimated site improvement costs, which is about \$21 million across all villages for complete build out. Final site improvements cost is variable depending on coordination with on-going infrastructure updates.

*** New facilities at Intake requires further technical study to understand feasibility of required infrastructure.



RECOMMENDED PHASING

One-bedroom extended-stay townhomes should be implemented in year one for all new employees and be assessed over a period of five years to gauge ability to recruit and retain employees with the new housing type.

Total capital improvements at all pump plants (three western villages and two satellite camps) will begin with an initial investment in the following:




















- 64 studio style hotel rooms.
- 24 one-bedroom extended-stay townhomes.
- 3 new commercial kitchens at Eagle Mtn., Iron Mtn., and Gene.
- 2 upgraded village amenities at Eagle Mtn. and Iron Mtn.
- 2 guest amenities at Hinds and Intake
- 1 conference room at Intake
- 9 single family homes at to be used as temporary rental units for visitors.

The opinion of probable cost, across all villages, for Phase 1 is approximately \$82 million dollars (2024 dollars; not including soft costs, sitewide infrastructure costs, or escalation).

If the model is successful, MWD should continue a phased approach introducing new townhome units and decommissioning single-family homes over subsequent phases, assessing employee satisfaction at the end of each phase. The phasing strategy on page 26 and 27 demonstrates how the villages can be built-out in three successive, three-year phases in terms of program allocation and capital costs.

If the townhomes are less successful, housing typology can adjust during phases 2-4 in order provide a more balanced mix of single-family housing, casita, and townhome units to reflect MWD strategy for recruiting and retaining future workforce. Refer to page 27 for potential cost differences depending on the housing mix pursued by MWD.

THREE DESERT VILLAGES 100% EXTENDED-STAY TOWNHOMES 105 HOUSING UNITS

	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
HINDS 	 3 guest hotel  1 guest amenity	-	-	-
EAGLE 	 8 townhome  1 upgraded amenity  17 guest hotel  1 kitchen  2 vacation rental	 8 townhome	 13 townhome  1 vacation rental	 6 townhome
IRON MT. 	 8 townhome  1 upgraded amenity  25 guest hotel  1 kitchen  2 vacation rental	 8 townhome	 13 townhome  1 vacation rental	 4 townhome
GENE 	 8 townhome  1 kitchen  15 guest hotel  2 vacation rental  2 vacation rental	 8 townhome  1 upgraded amenity	 13 townhome  1 vacation rental	 8 townhome
INTAKE 	 4 guest hotel  1° guest amenity  3 vacation rental	-	-	-
TOTAL	 24  2  64  2°  9  3	 24  1	 39  3  8  8	 18

° Intake will include a 800 sq. ft. conference room estimated at +/- \$750,000.

THREE DESERT VILLAGES 100% EXTENDED-STAY TOWNHOMES 105 HOUSING UNITS

VILLAGE TOTAL	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
 HINDS \$2.4M	\$2.4M 3 GUEST HOTEL 1 GUEST AMENITY	-	-	-
 EAGLE \$44.6M	\$26.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 17 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	\$4.8M 8 EXTENDED STAY TOWNHOMES	\$9.4M 13 EXTENDED STAY TOWNHOMES 1 VACATION RENTAL	\$3.6M 6 EXTENDED STAY TOWNHOMES
 IRON MT. \$45.4M	\$28.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 25 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	\$4.8M 8 EXTENDED STAY TOWNHOMES	\$9.4M 13 EXTENDED STAY TOWNHOMES 1 VACATION RENTAL	\$2.4M 4 EXTENDED STAY TOWNHOMES
 GENE \$45.3M	\$16M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 15 GUEST HOTEL 1 KITCHEN	\$15.1M 8 EXTENDED STAY TOWNHOMES 1 UPGRADED AMENITY	\$9.4M 13 EXTENDED STAY TOWNHOMES 1 VACATION RENTAL	\$4.8M 8 EXTENDED STAY TOWNHOMES
 INTAKE \$7.9M	\$7.9M 4 GUEST HOTEL 1 GUEST AMENITY + CONFERENCE ROOM 3 VACATION RENTALS	-	-	-
TOTAL \$145.6M	\$81.9M	\$24.7M	\$28.2M	\$10.8M
















° Intake will include a 800 sq. ft. conference room estimated at +/- \$750,000.

*10% housing increase across all villages and scenarios

** These cost estimates do not include the estimated site improvement costs, which is about \$21 million across all villages for complete build out. Final site improvements cost is variable depending on coordination with on-going infrastructure updates.

*** New facilities at Intake requires further technical study to understand feasibility of required infrastructure.

ALTERNATIVE HOUSING MIXES

SUMMARY	COST	MODEL
THREE DESERT VILLAGES: 100% EXTENDED-STAY TOWNHOMES Preferred Scenario		
105 extended-stay townhomes 12 vacation rentals 64 guest hotels 3 upgraded amenity packages 2 guest amenity packages 3 kitchens	\$145M	    
THREE DESERT VILLAGES: 50% EXTENDED-STAY TOWNHOMES/50% SINGLE FAMILY HOMES		
54 single family homes 53 extended-stay townhomes 9 vacation rentals 64 guest hotels 3 upgraded amenity packages 2 guest amenity packages 3 kitchens	\$189M	    
THREE DESERT VILLAGES: 100% SINGLE FAMILY HOMES		
105 single family homes 24 extended-stay townhomes 64 guest hotels 3 upgraded amenity packages 2 guest amenity packages 3 kitchens 9 vacation rentals	\$249M	    

° Intake will include a 800 sq. ft. conference room estimated at +/- \$750,000.

*10% housing increase across all villages and scenarios

** These cost estimates do not include the estimated site improvement costs, which is about \$21 million across all villages for complete build out. Final site improvements cost is variable depending on coordination with on-going infrastructure updates.

*** New facilities at Intake requires further technical study to understand feasibility of required infrastructure.

The preferred strategy is for 100% townhomes at Eagle Mtn., Iron Mtn., and Gene with satellite camps at Hinds and Intake.

Should Phase 1 prove unsuccessful as indicated by a future assessment of the Townhome Pilot Program, MWD could change course and implement an alternative housing program that best suits the needs of the future desert workforce. The adjacent page demonstrates two other potential village strategies; 1) 50% townhomes / 50% single family homes at each village and 2) 100% single family homes at each village.



NEXT STEPS

DECISIONS

The following decisions will guide the design and implementation phase.

1. Confirm consolidated village strategy as outlined in this report is the preferred direction.
2. Confirm recommended phasing and investment strategy outlined in this report is the preferred direction.
3. Initiate individual village concept design and phasing strategy.
4. Evaluate current capital improvement program against preferred village strategy for potential future cost savings.
5. Develop transition plan to relocate Hinds employees to Eagle Mountain
6. Create an assessment strategy and review committee for Townhome Pilot Program that includes union and employee participation.

DESIGN AND IMPLEMENTATION

Site Specific Design

Continue to develop:

- Village by Village test fits
- Refined Phasing Strategy

Preliminary Design

Begin design on new project components:

- Site plan and phasing strategy for each village
- Townhomes/Casita layout
- Amenity Package
- Validate Component Design from Previous Work
- Village Placemaking
- Hotel layout
- Single Family Homes
- Commercial Kitchens

Cost Estimates

Prepare refined cost estimates for:

- Each village as design progresses
- The decommissioning of villages as phasing strategy and village test fits progress.

COMMUNITY PLANNING CONCEPTUAL DESIGN

MWD Housing & Property Improvements Prpgram At The Desert Facilities

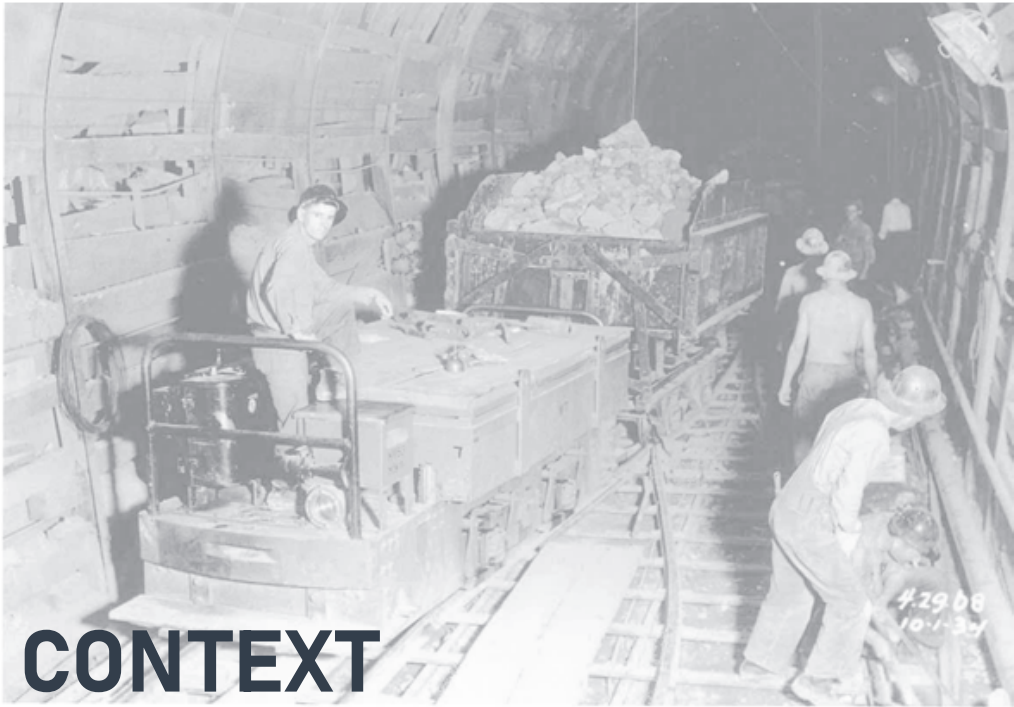
Appendix

■ VILLAGE ANALYSIS AND UNDERSTANDING	2
■ COMMUNITY OUTREACH	28
■ PROJECT PARAMETERS	64
■ VILLAGE ORGANIZATION STRATEGIES	72
■ DETAILED PHASING STRATEGY FOR EACH VILLAGE	111
■ AMENITIES AND COSTS	133
■ DETAILED ROM COSTS	143



VILLAGE ANALYSIS AND UNDERSTANDING

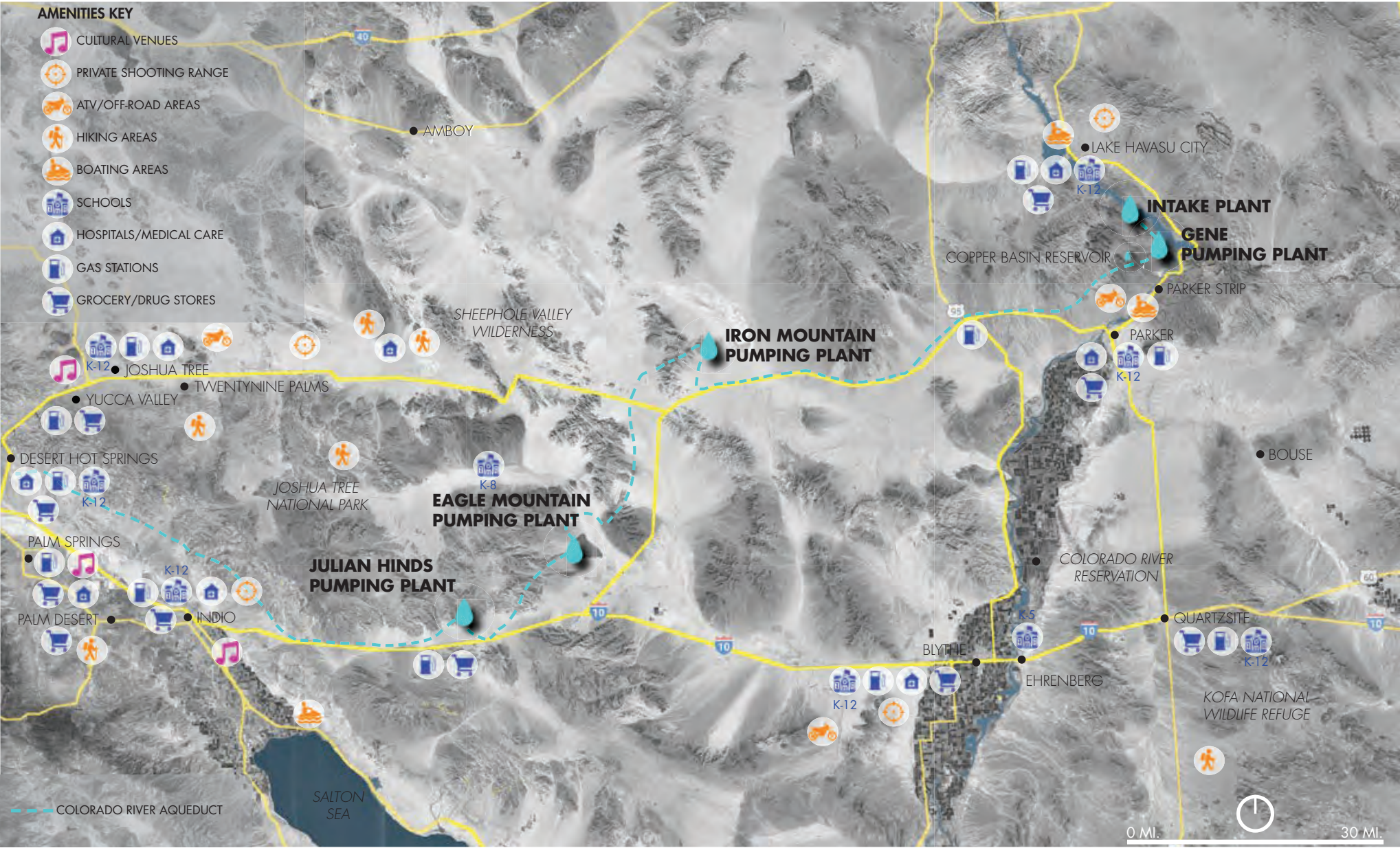
- REGIONAL CONTEXT 3
- VILLAGE ANALYSIS 8

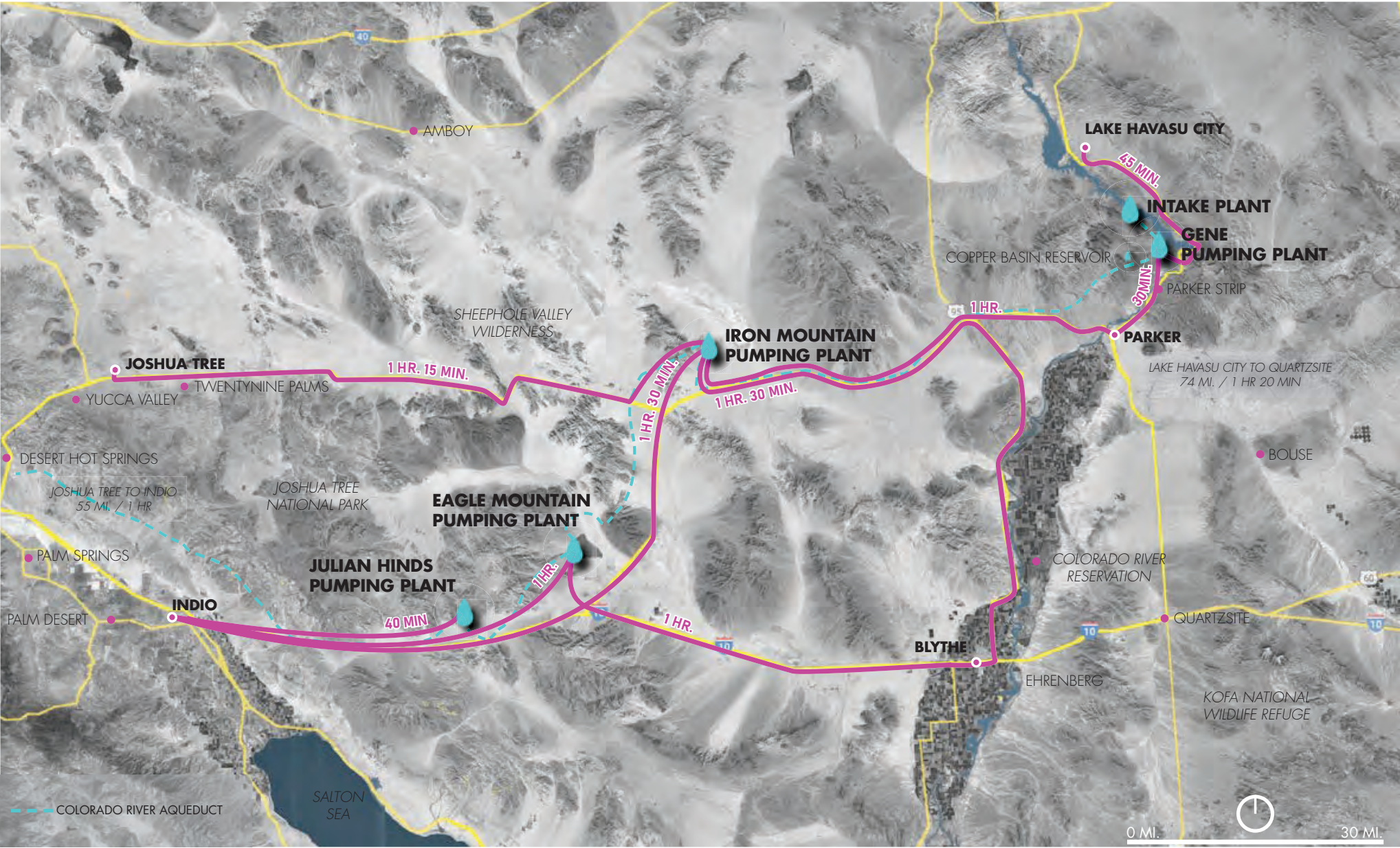


REGIONAL CONTEXT







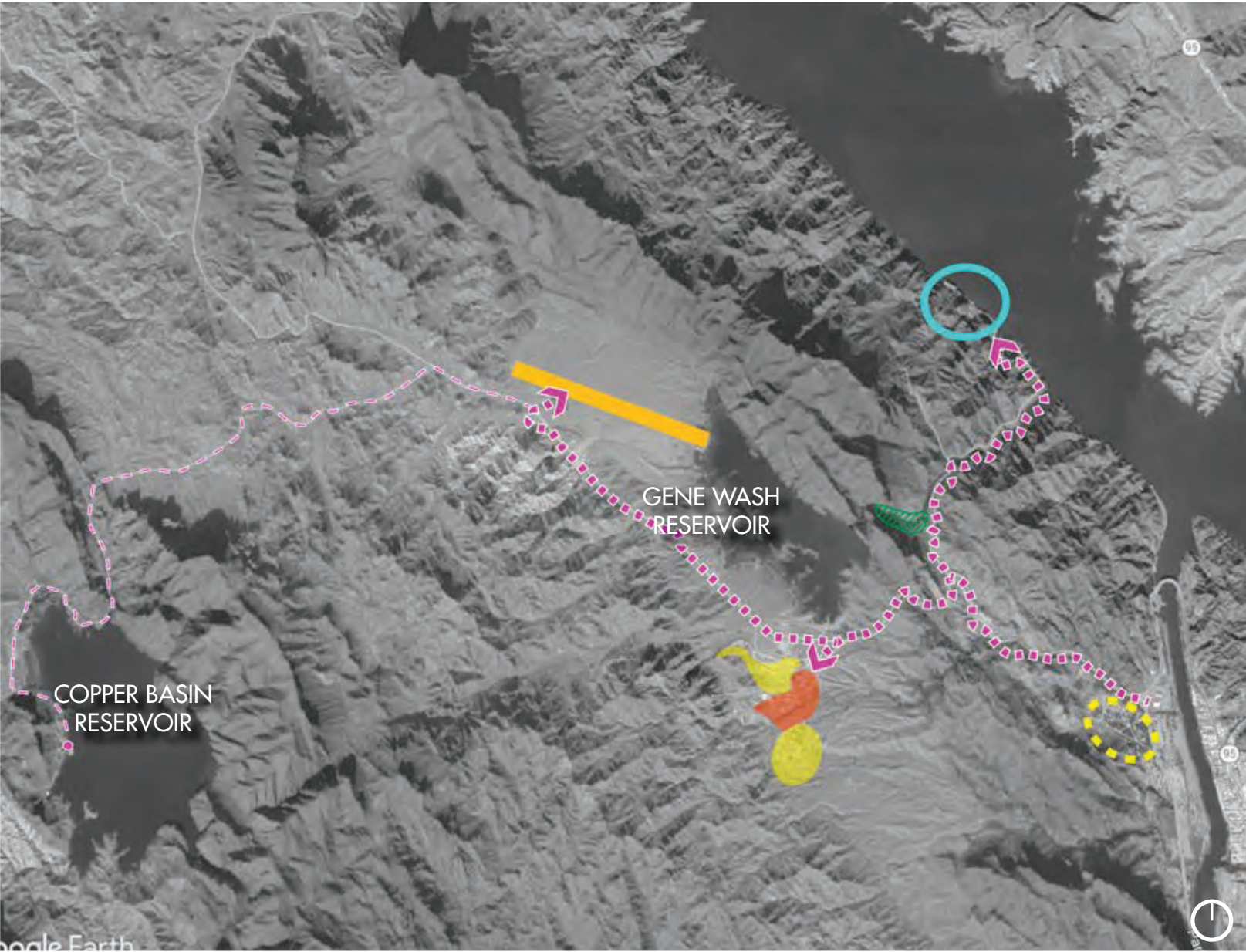




ARTIST'S SKETCH OF AQUEDUCT DIVERSION WORKS



VILLAGE ANALYSIS

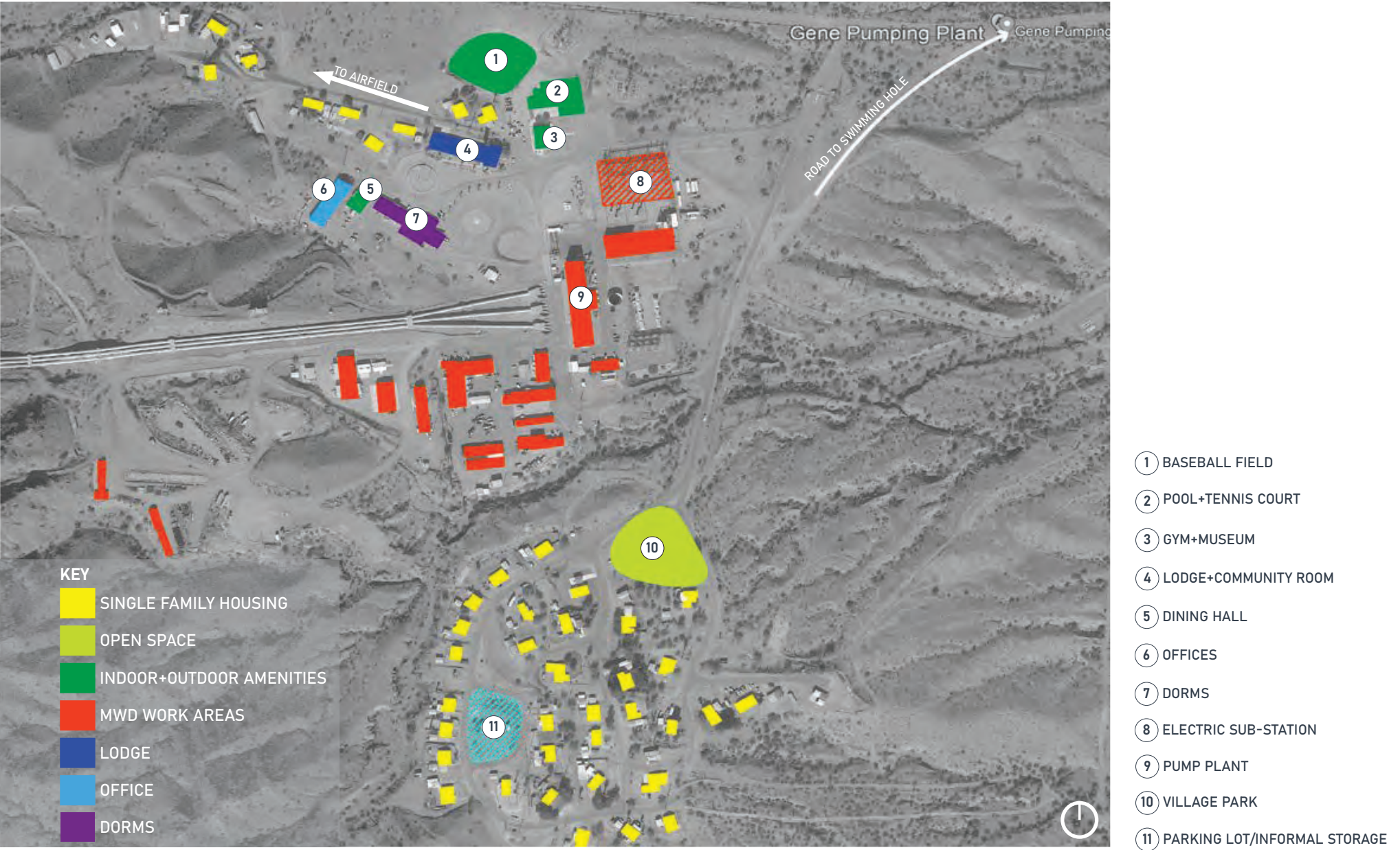


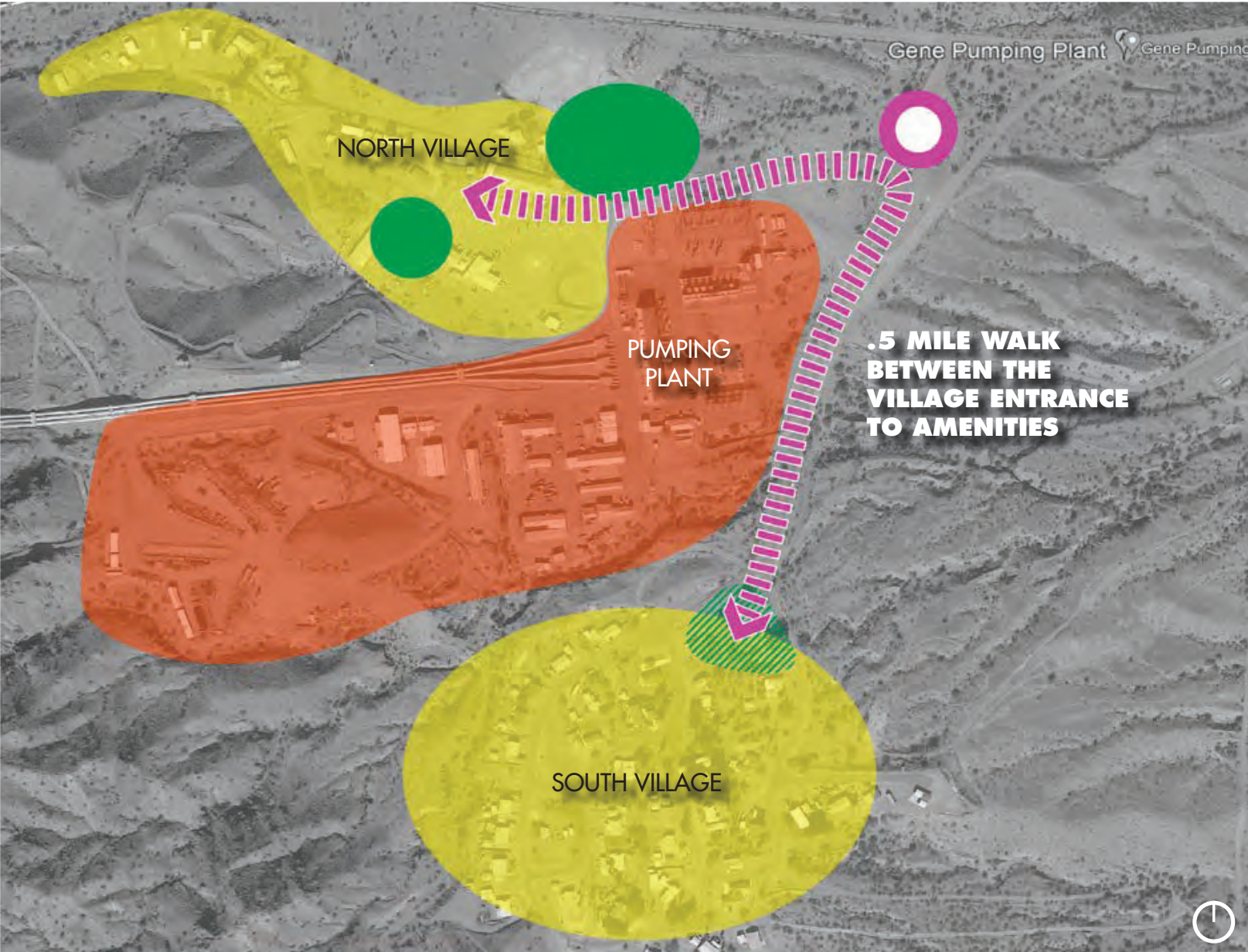
KEY OBSERVATIONS

- Intake pump plant is about 3.2 miles away from Gene and staff in Intake lives in Gene Village during shift.
- Boating dock in Intake and Swimming Hole is a great asset as a recreational destination for residents.

KEY

- VILLAGE
- FORMER LOWER VILLAGE
- SWIMMING HOLE
- PUMP PLANT OPERATIONS
- INTAKE PLANT
- AIRPORT LANDING STRIP
- MAIN CIRCULATION
- ROUTE TO COPPER BASIN HOME





- KEY OBSERVATIONS**
- The two villages are separated by pump plant operations.
 - All amenities are located in the northern village away from the majority of residents.
 - The village park (#10) is located at the edge of the neighborhood and is surrounded by roads.
 - Vacant land is informally used as storage of personal vehicles creating an eyesore for adjacent residences.
 - Truck traffic is generally separated from villages.
 - Temp trailers for transient workers are clustered in the north village.

- KEY**
- VILLAGE
 - AMENITY
 - OPEN SPACE
 - PUMP PLANT OPERATIONS
 - SECURITY CHECK POINT
 - MAIN CIRCULATION



POPULATION


29 TOTAL EMPLOYEES

- 4 ON-CALL STAFF
- # PUMP PLANT OPERATORS
- # O&M
- # ADMIN
- # KITCHEN & HOSPITALITY
- # AVERAGE CONTRACT WORKERS

10 PERMANENT HOUSEHOLDS

- # YOUNG SCHOOL AGE CHILDREN
- # HIGH SCHOOL AGE CHILDREN

30 SHIFT RESIDENTS



HOUSING

42 TOTAL HOMES

- 27 OCCUPIED HOMES
- 2 STANDBY HOMES
- # TEMPORARY TRAILERS
- # DORM FACILITIES
- # LODGE FACILITIES
- 28 HOMES TO BE RENOVATED
- 5 HOMES TO BE DEMOLISHED
- 2 HOMES RECENTLY BUILT



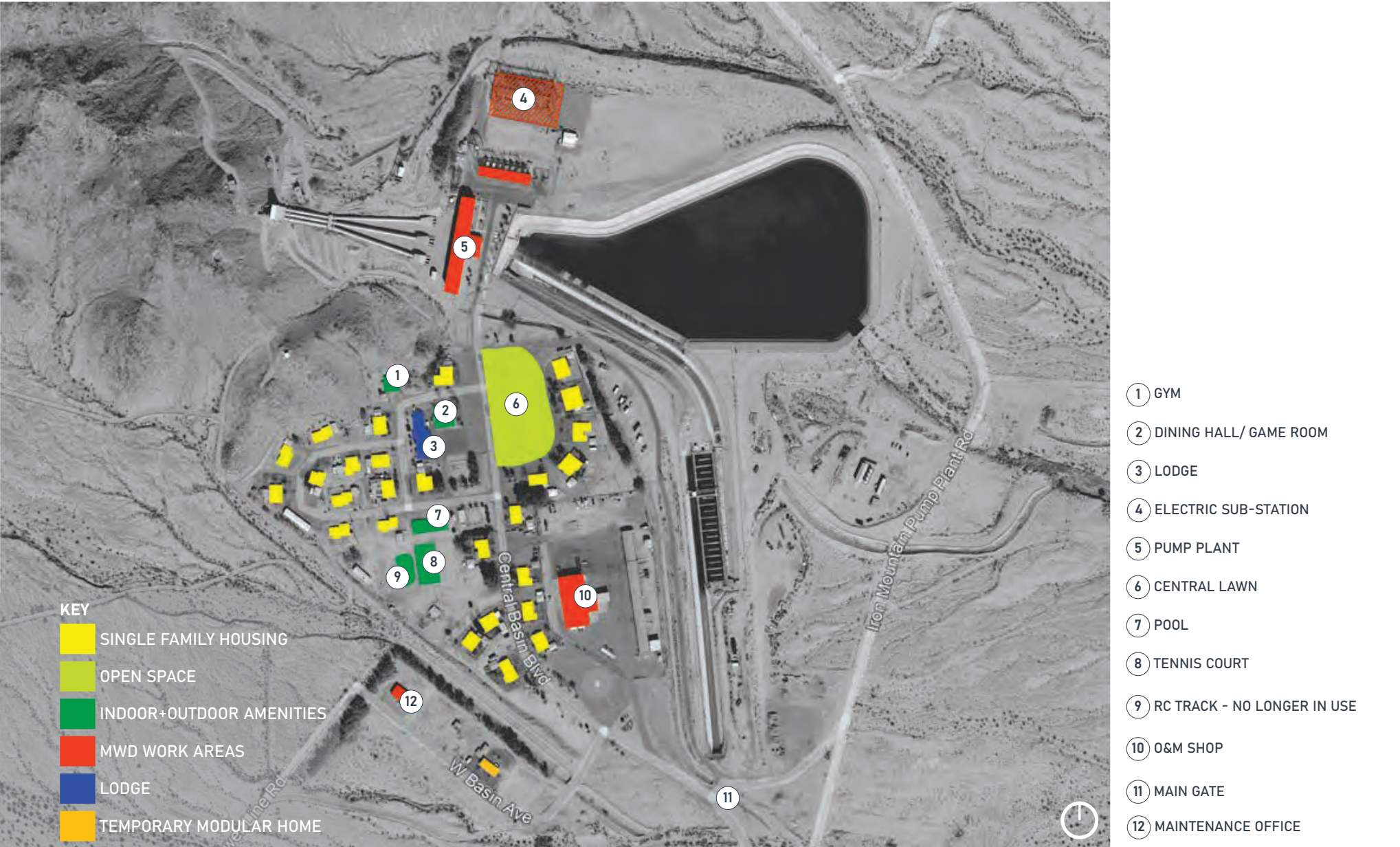
AMENITIES

7 AMENITIES PROVIDED BY MWD

- REC ROOM
- POOL
- BASEBALL FIELD
- SWIMMING HOLE
- TENNIS COURT
- COMMUNITY ROOM
- DINING HALL

Note: all #'s represent unknown quantities that are to be provided and/or verified by MWD.







KEY OBSERVATIONS

- O&M headquarters and maintenance facility is located next to the village causing lots of heavy service traffic and noise.
- Central basin blvd. is the main plant access and bisects residential areas.
- Amenities are clustered central to residences.
- Housing is dispersed in an unplanned fashion.
- There is some separation of residences from pump plant facilities.

KEY

- VILLAGE
- AMENITY
- OPEN SPACE
- PUMP PLANT OPERATIONS
- SECURITY CHECK POINT
- MAIN CIRCULATION

**POPULATION**

25 TOTAL EMPLOYEES

- 2 ON-CALL STAFF
- # PUMP PLANT OPERATORS
- # O&M - HEADQUARTERS
- # ADMIN
- # KITCHEN & HOSPITALITY
- # AVERAGE CONTRACT WORKERS

5 PERMANENT HOUSEHOLDS

- 2 YOUNG SCHOOL AGE CHILDREN
- 1 HIGH SCHOOL AGE CHILDREN

20 SHIFT RESIDENTS

**HOUSING**

27 TOTAL HOMES

- 20 OCCUPIED HOMES
- 2 STANDBY HOMES
- 2 TEMPORARY TRAILERS
- 15 DORM FACILITIES
- # LODGE FACILITIES
- 16 HOMES TO BE RENOVATED
- 7 HOMES TO BE DEMOLISHED
- 4 HOMES RECENTLY BUILT

**AMENITIES**

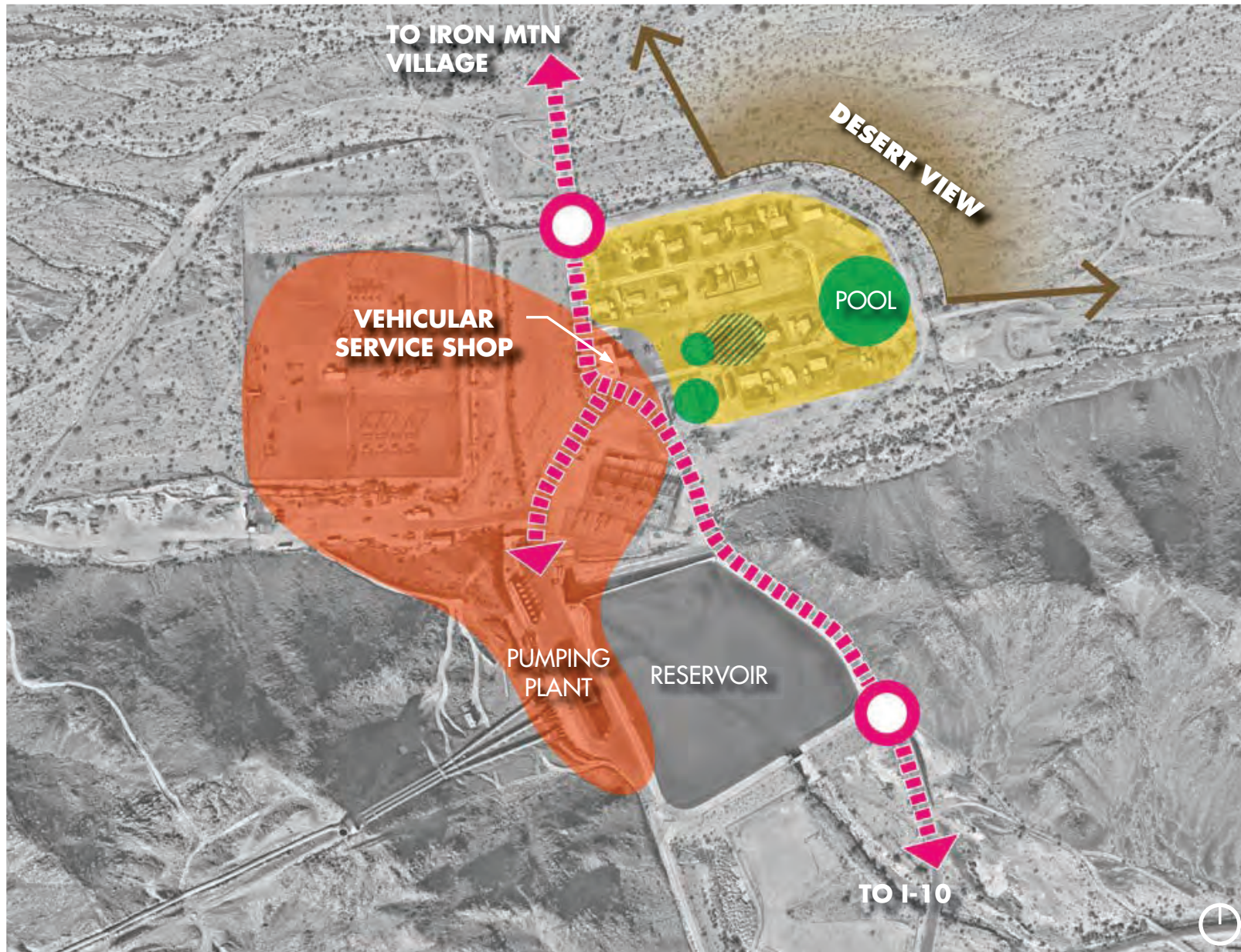
8 AMENITIES PROVIDED BY MWD

- GYM
- POOL
- CENTRAL LAWN
- FRISBEE GOLF
- PLAYGROUND
- TENNIS COURT
- GAME ROOM
- DINING HALL

Note: all #'s represent unknown quantities that are to be provided and/or verified by MWD.







KEY OBSERVATIONS

- The village and amenities are separated from pump plant and work area.
- Village has two secure entry locations.
- Housing layout lends itself to creating a stronger community feeling and should be considered for all future village layouts.
- The pool is located at the edge of the village creating an opportunity to celebrate desert views.
- Large asphalt area at maintenance area increases heat island effect.
- Distinct lack of trees in the village.
- CIM office location brings traffic and outsiders through village

KEY

- VILLAGE
- AMENITY
- OPEN SPACE
- PUMP PLANT OPERATIONS
- SECURITY CHECK POINT
- MAIN CIRCULATION

**POPULATION**

12 TOTAL EMPLOYEES

- 2 ON-CALL STAFF
- # PUMP PLANT OPERATORS - HQ
- # O&M
- # ADMIN
- # KITCHEN & HOSPITALITY
- # AVERAGE CONTRACT WORKERS

6 PERMANENT HOUSEHOLDS

- # YOUNG SCHOOL AGE CHILDREN
- # HIGH SCHOOL AGE CHILDREN

6 SHIFT RESIDENTS

**HOUSING**

17 TOTAL HOMES

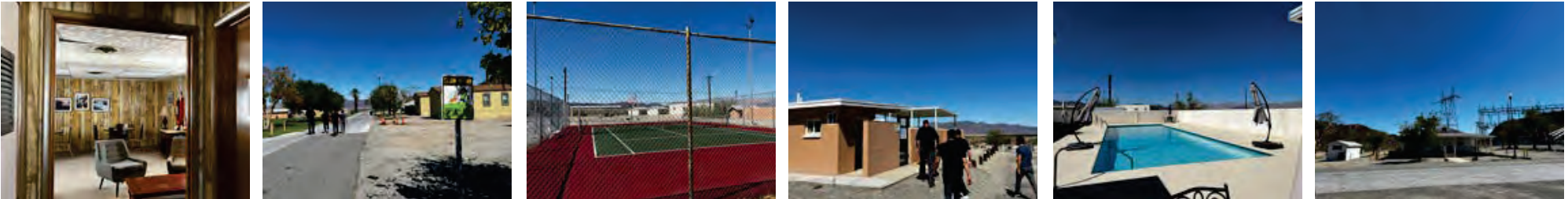
- 12 OCCUPIED HOMES
- # STANDBY HOMES
- 0 TEMPORARY TRAILERS
- 10 DORM FACILITIES
- 0 LODGE FACILITIES
- 11 HOMES TO BE RENOVATED
- 1 HOMES TO BE DEMOLISHED
- 2 HOMES RECENTLY BUILT

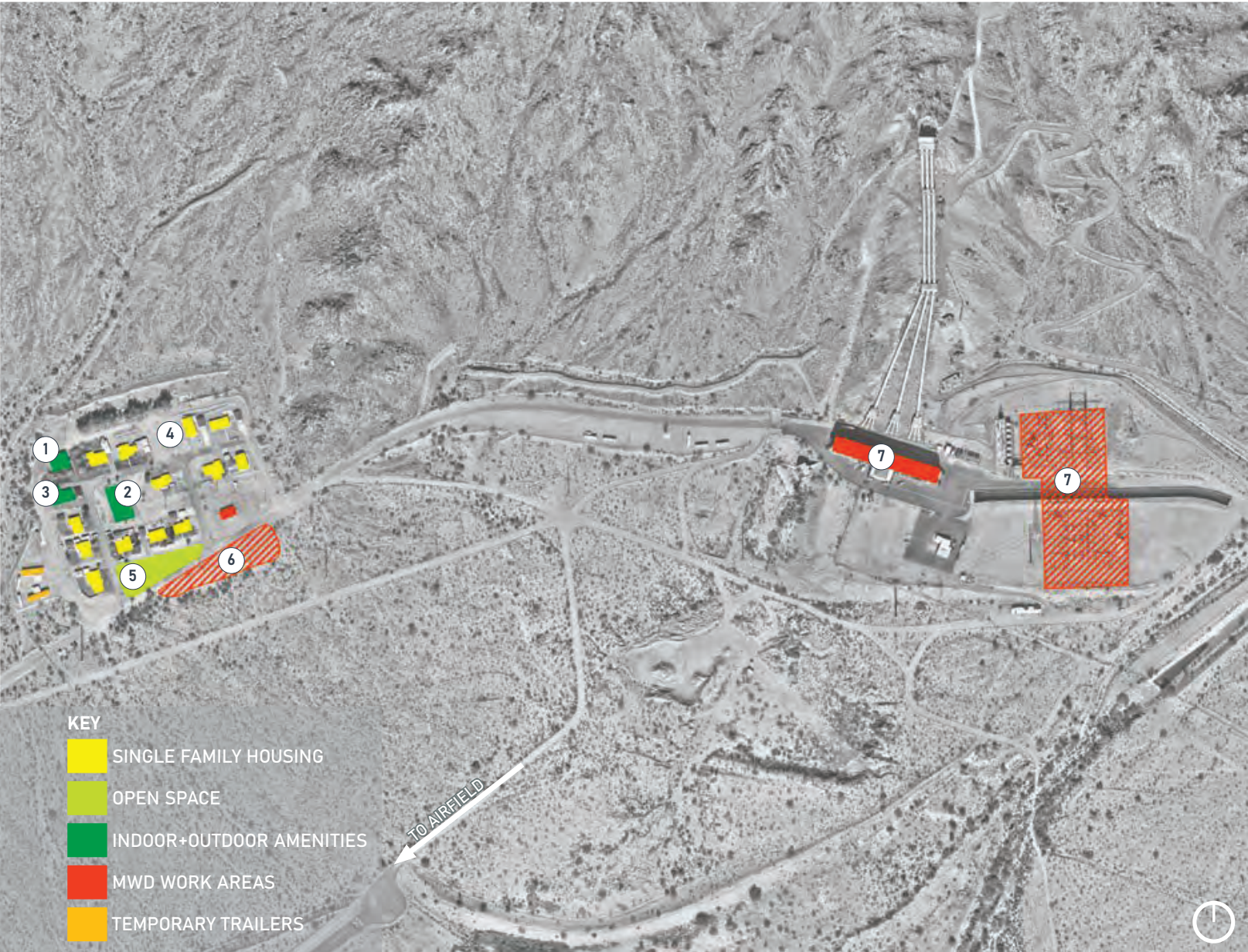
**AMENITIES**

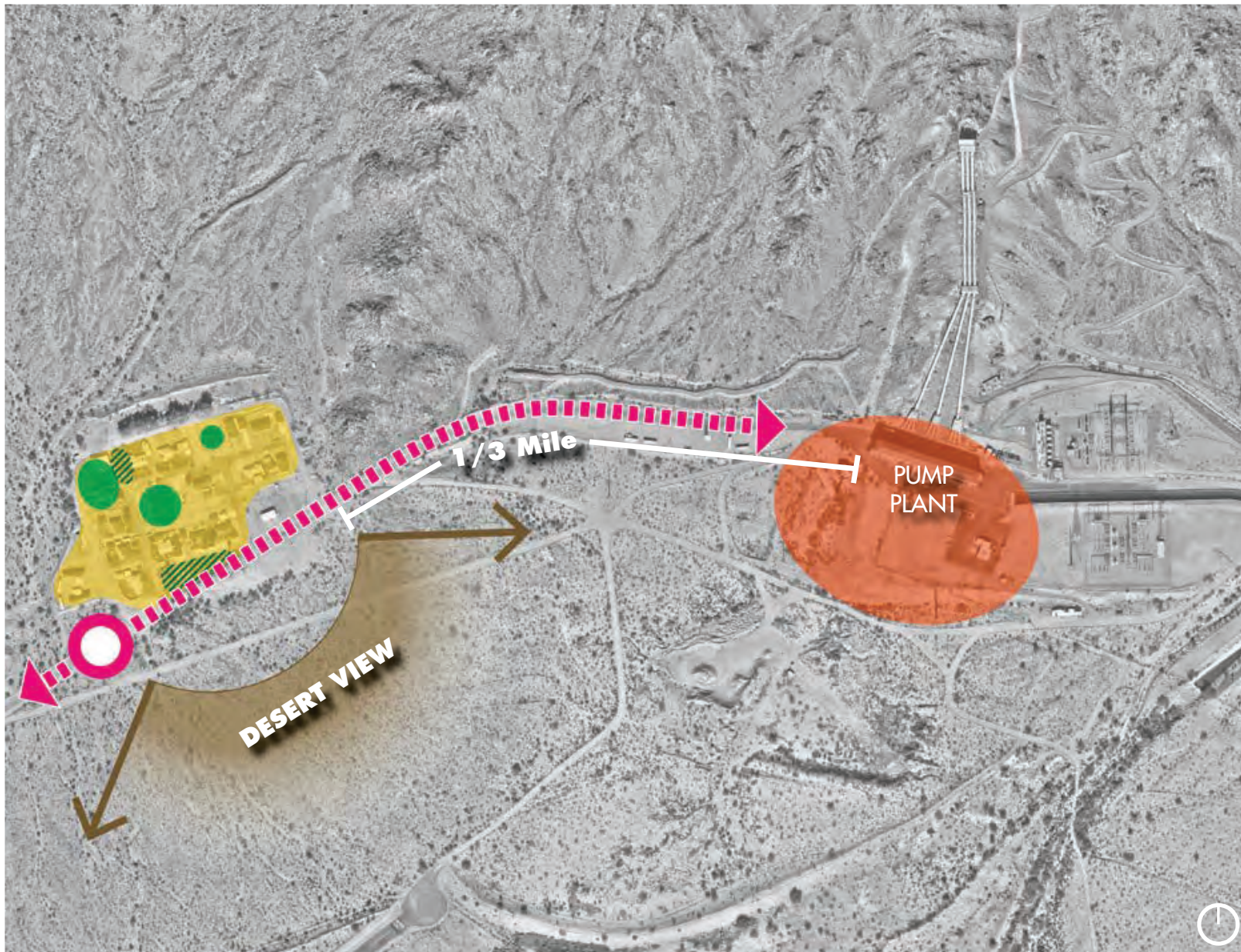
5 AMENITIES PROVIDED BY MWD

- DINING HALL
- POOL
- CENTRAL LAWN
- TENNIS COURT
- PLAYGROUND

Note: all #'s represent unknown quantities that are to be provided and/or verified by MWD.







KEY OBSERVATIONS

- The village and amenities are separated from pumping plant and work area, creating a sense of home.
- The village and houses have a desert view sitting at a higher elevation than the main service access road.
- There are existing trees located at the north side of the village. They are situated at the toe of the mountain slope, presumably planted as a wind block. Measures should be taken to preserve these and plant more for future generations.
- Open space is located at the edge of the village, offering views but is not central to all residences.
- Lack of non-resident facilities at or near the plant creates scheduling and use conflicts for the recreational amenities, and between permanent and temporary workers.
- Although the main access road runs adjacent to the village, residents privacy isn't disturbed by service vehicular traffic. This is likely because there are no other operational facilities located on site.

KEY

- VILLAGE
- AMENITY
- OPEN SPACE
- PUMP PLANT OPERATIONS
- SECURITY CHECK POINT
- MAIN CIRCULATION



POPULATION

12 TOTAL EMPLOYEES

- 2 ON-CALL STAFF
- # PUMP PLANT OPERATORS - HQ
- # O&M
- # ADMIN
- # KITCHEN & HOSPITALITY
- # AVERAGE CONTRACT WORKERS

5 PERMANENT HOUSEHOLDS

- 6 YOUNG SCHOOL AGE CHILDREN
- 0 HIGH SCHOOL AGE CHILDREN

7 SHIFT RESIDENTS



HOUSING

13 TOTAL HOMES

- 12 OCCUPIED HOMES
- # STANDBY HOMES
- 4 TEMPORARY TRAILERS
- 0 DORM FACILITIES
- 0 LODGE FACILITIES
- 8 HOMES TO BE RENOVATED
- 0 HOMES TO BE DEMOLISHED
- 3 HOMES RECENTLY BUILT



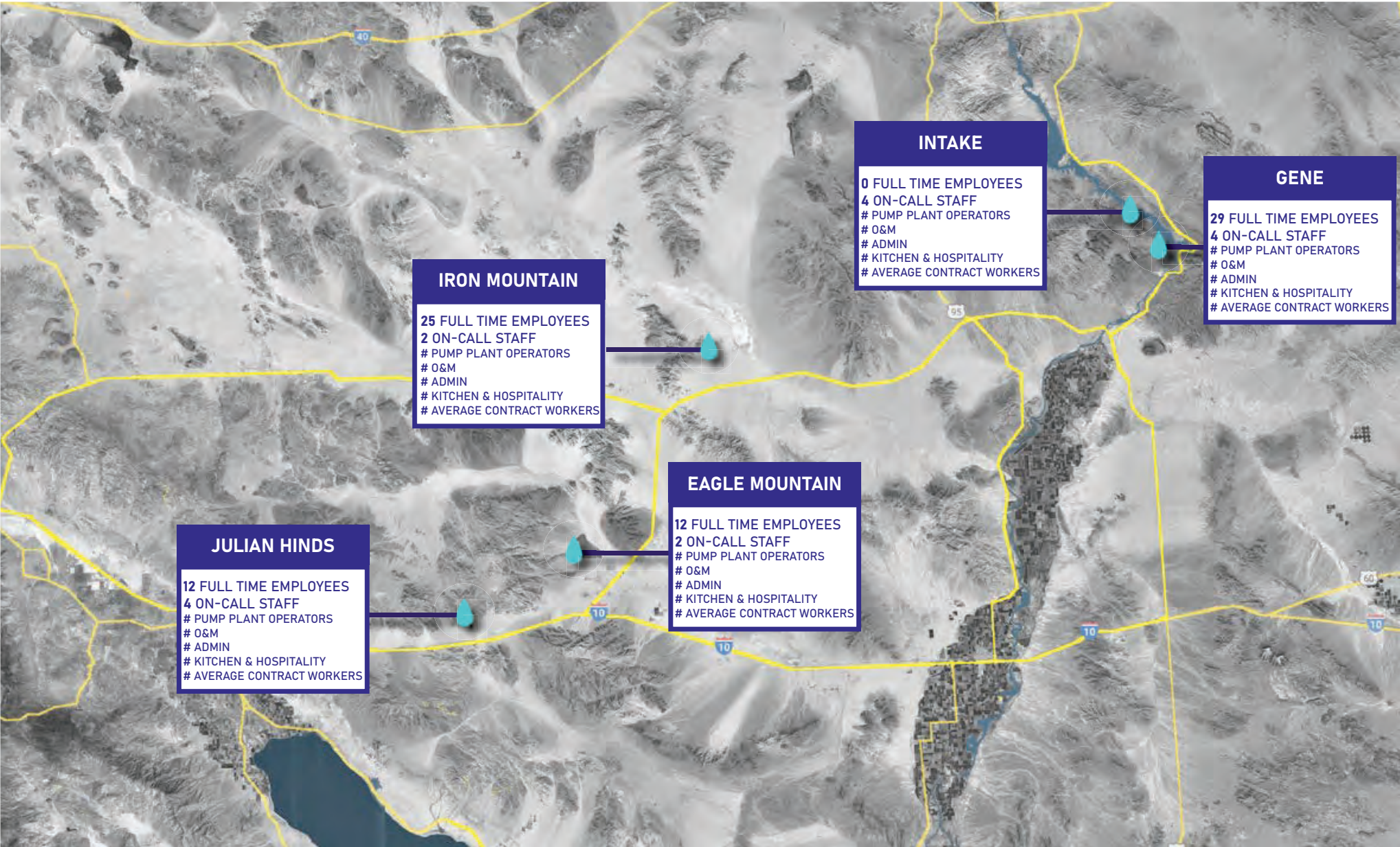
AMENITIES

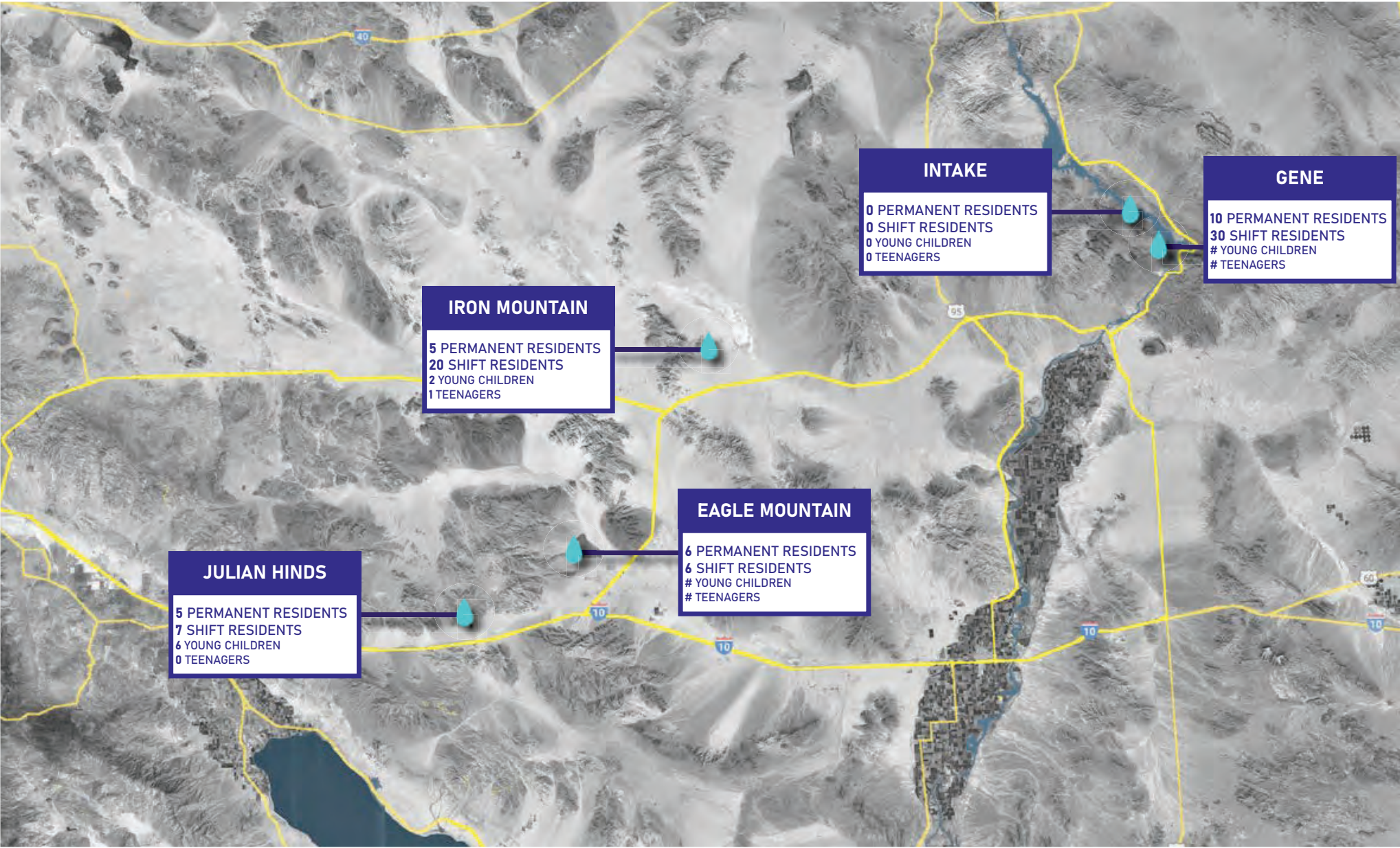
5 AMENITIES PROVIDED BY MWD

- REC HALL
- POOL
- CENTRAL LAWN
- TENNIS COURT
- PLAYGROUND

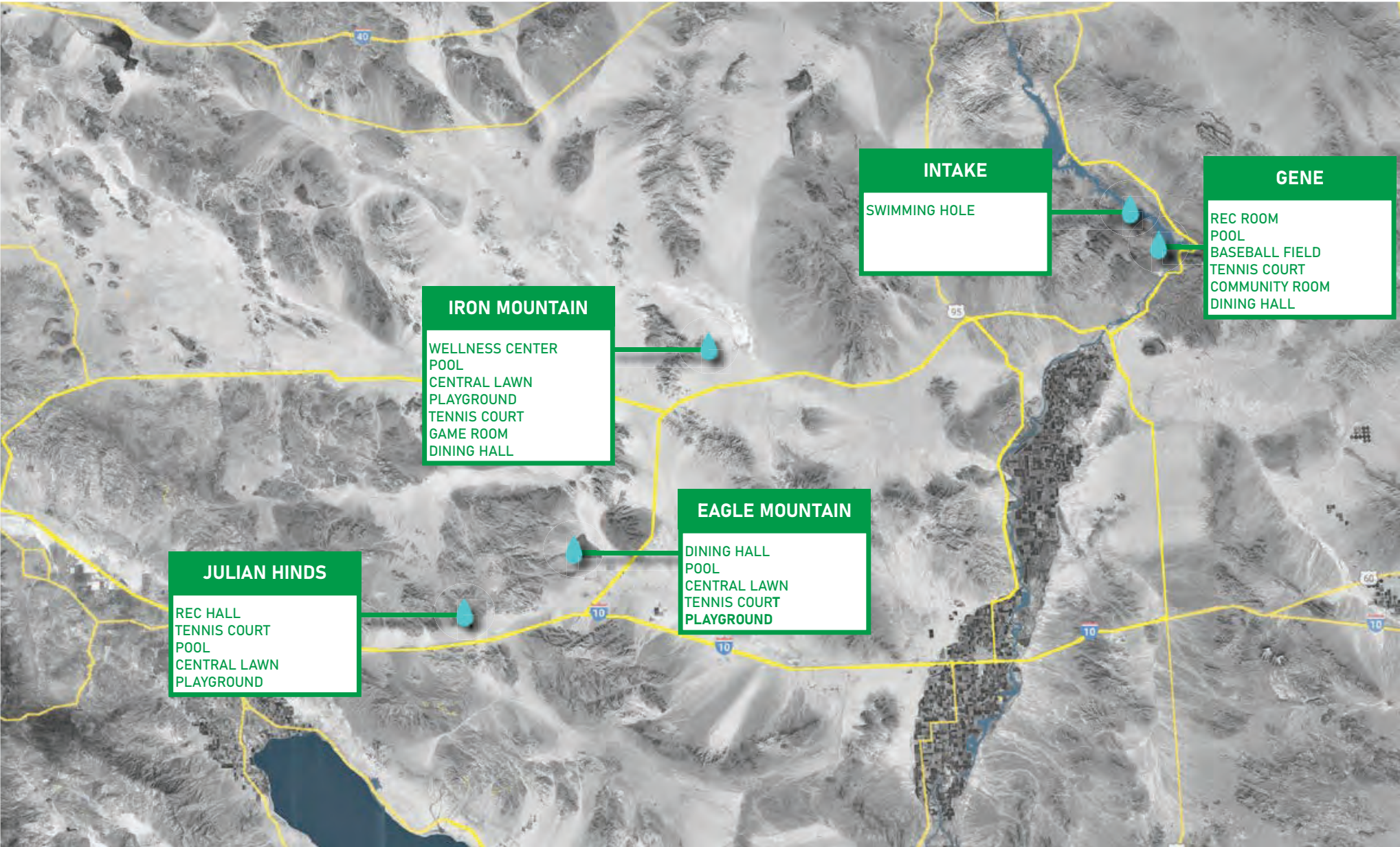
Note: all #'s represent unknown quantities that are to be provided and/or verified by MWD.

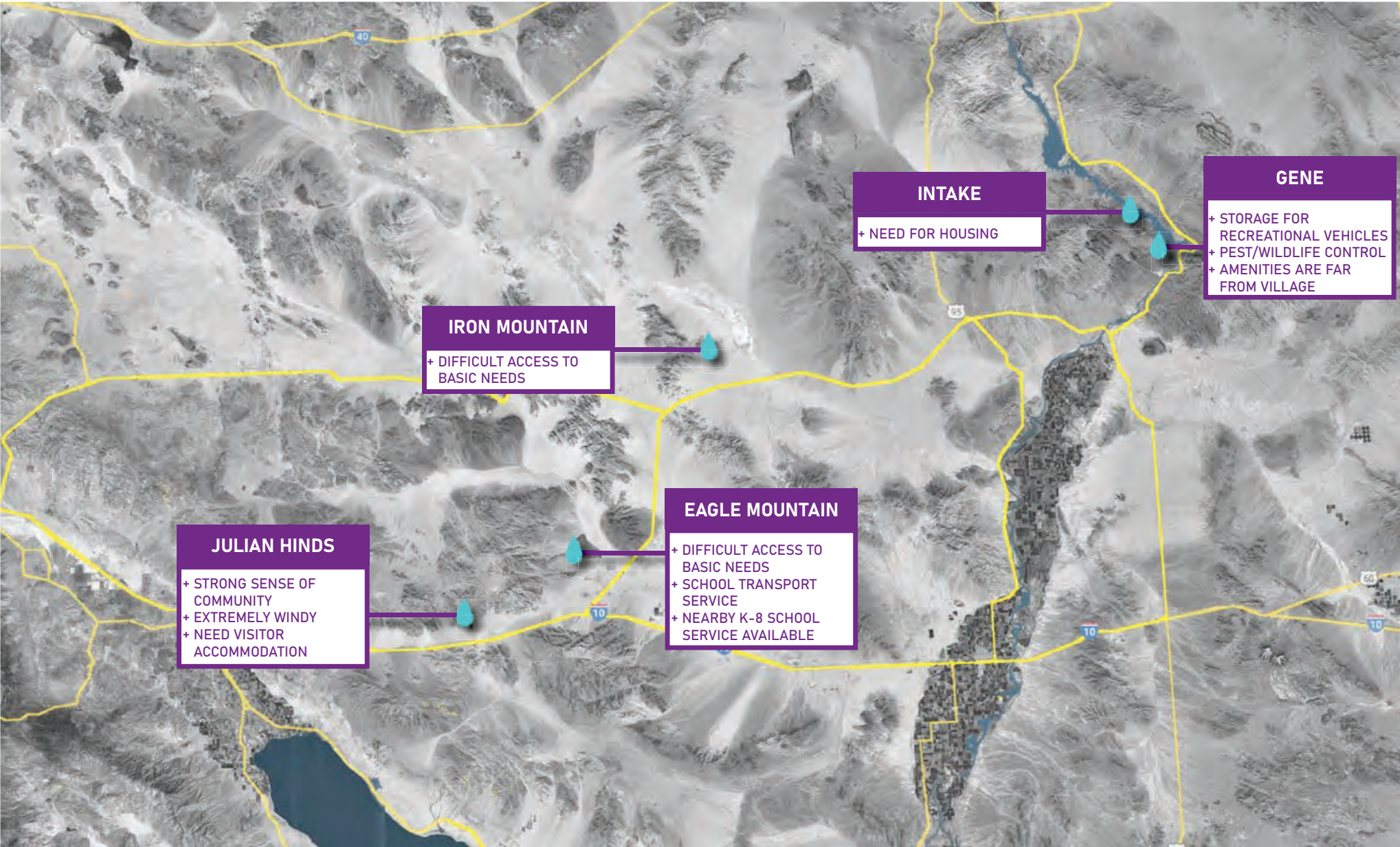














After a series of interviews with Metropolitan Water District staff, leadership, current residents and employees, and union representatives, we developed a greater level of understanding about the lifestyles of employees, as well as cultural aspects of working and living in the High Desert of Southern California. Community engagement and management feedback informed the following observations:

1. Due to its irregular layout and poor site conditions, the southern village of Gene offers the least sense of community and has the lowest percentage of permanent residents. This may also be due to its proximity to larger towns, such as Parker and Lake Havasu City.
2. Housing must be provided at the intake plant in order to meet the 15-minute response requirement.
3. In general, villages should be distanced from the plant and service facility in order to create a sense of separation and "going home" after a work shift.
4. The main access road should be separate from the villages so that service traffic does not disrupt the community.
5. New residential neighborhood typologies should be considered. These typologies may organize residences around common community amenities and open spaces, separates heavy equipment and visitor traffic from the residences, and provides separate resident and visitor amenities.
6. Multi-use indoor sports field is an option to create a multi-purpose, climate controlled amenity.
7. Condominiums with front doors, or even personal RV use would be considered, but needs to be coupled with salary, shift adjustment and amenity packages.
8. Planting trees with proper irrigation systems provide shade and overall beautification of village.
9. Optional landscape contracts for front yard and private spaces need to be provided. This might help to address the vacant homes that

need to be maintained while residents are not living there.

10. Iron Mountain and Eagle Mountain villages have a stronger sense of community given their remoteness.
11. Many residents in the Iron Mountain, Eagle Mountain, and Julian Hinds villages acknowledge their choice to live in remote location for pay and benefits, but there is a strong desire for basic improvements expected for human habitation in a desert (working ac, proper gym, shade, landscape, work/life balance and separation).

The Metropolitan Water District villages along the Colorado River Aqueduct were established at a time when there were less options for living in the High Desert. The villages were more remote and access and personal transportation was less sophisticated. In the last 75 years, surrounding cities have developed, more amenities have become available in nearby towns, paved highways were built, and personal vehicles have become the norm. By analyzing community needs and issues,

our observations listed above help to establish guiding principles but also raises significant questions about the role of MWD villages moving forward:

- Are we creating villages intended to support permanent residents or are we creating 'Shift' accommodations?
- Is compensation part of the equation when considering housing typologies? Should we consider moving away from 'Equal housing' and towards appropriate tied to lifestyle and compensation package?
- Should we consider creating a consolidated western village with elevated amenities and employees are then expected to commute to pump plants? (Pump plants would have limited on-call accommodations)?
- Should we consider transitioning away from Gene as a permanent village given proximity to Lake Havasu and Parker?
- Would MWD consider partnering with a developer to build a future village?

COMMUNITY OUTREACH

- COMMUNITY INTERVIEW IN AUGUST, 2023 29
- ON-LINE SURVEY IN FEBRUARY, 2024 33

ENGAGEMENT
AT A GLANCE



15+ HOURS OF COMMUNITY INTERVIEWS

130+
UNIQUE COMMENTS

10+
WRITTEN COMMENTS



4 COMMUNITY MEETINGS

40+

EMPLOYEES AND
RESIDENTS ENGAGED
(5 PUMPING PLANTS)



5 SITE WALKS

	FACTS	COMMON THEMES	LIFE-STYLE THEMES		INTAKE	GENE	IRON MOUNTAIN	EAGLE	HINDS
EXISTING CONDITIONS		1 housing cluster 100+ residents				40+ houses 100+ residents 100+ residents 100+ residents	20 houses 100+ residents 100+ residents 100+ residents	10 houses 100+ residents 100+ residents 100+ residents	10 houses 100+ residents 100+ residents 100+ residents
MANAGEMENT /PLANT OPERATIONS		1 house 100+ residents				100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents
VILLAGE WIDE						100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents
LIFE STYLE /CULTURE						100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents
HOUSING		100+ residents				100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents
AMENITIES		100+ residents				100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents
PUBLIC SAFETY						100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents
SCHOOLING						100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents	100+ residents 100+ residents 100+ residents 100+ residents

KEY

FACTS

THEMES THROUGHOUT VILLAGE

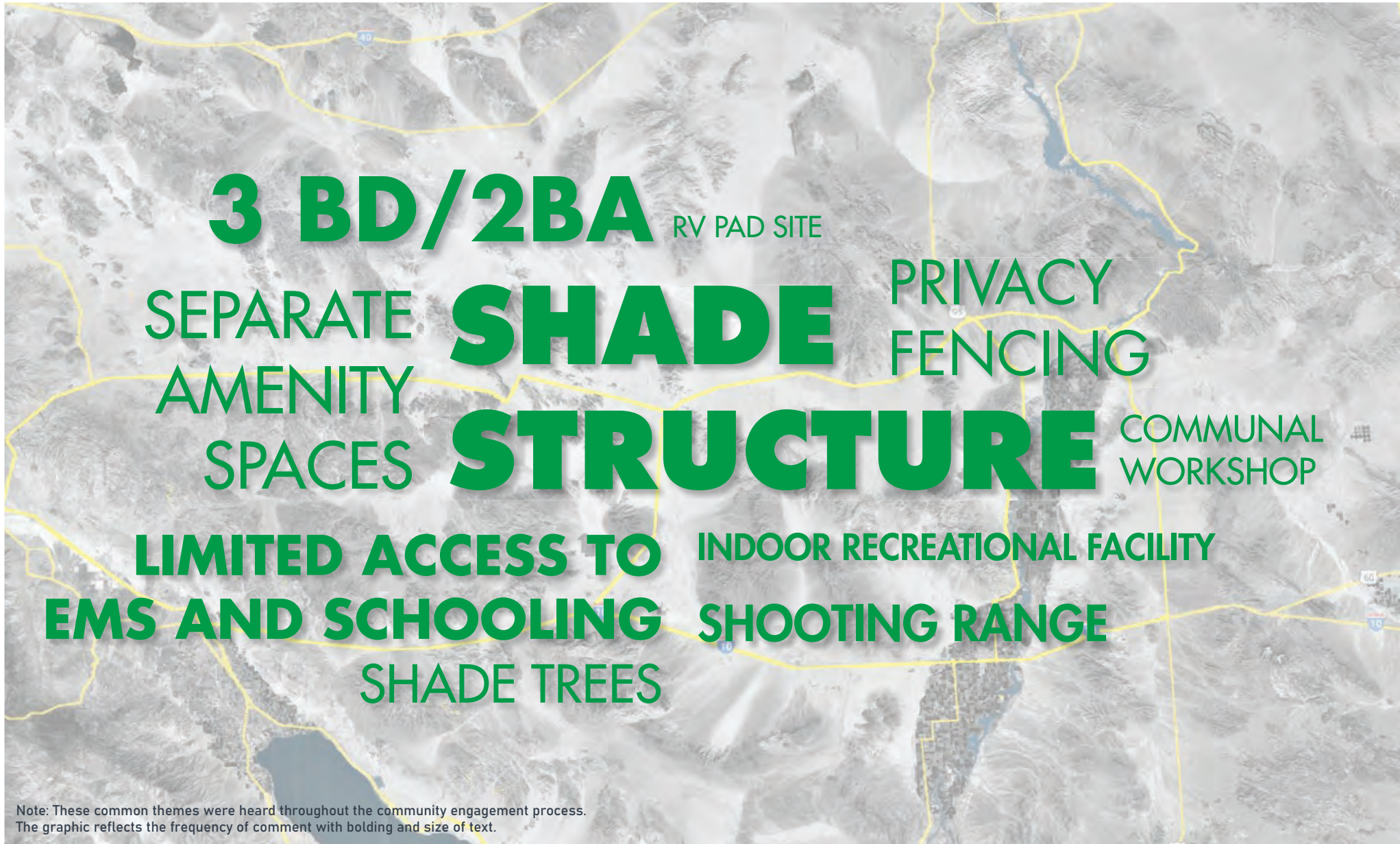
THEMES SPECIFIC TO VILLAGE

COMMON THEMES AMONG ALL VILLAGES

LIFESTYLE/CULTURE	HOUSING	AMENITIES	PUBLIC SAFETY	EDUCATION
<div><div></div><div>+ LIVE/WORK IN THE VILLAGE</div><div>+ GREAT OPPORTUNITY FOR OUTDOOR ACTIVITIES</div><div>+ QUIET SMALL TOWN FEELING</div><div>+ HAVING THEIR OWN FRONT DOOR TO GO HOME TO AT THE END OF THE DAY IS IMPORTANT</div><div>+ COMARADERIE AMONGST PUMP PLANT EMPLOYEES AND SENSE OF PRIDE AND OWNERSHIP OVER PUMP PLANT</div><div>+ THE SENSE OF SECURITY LIVING IN A 'GATED' COMMUNITY IS HIGHLY VALUED</div></div>	<div><div></div><div>+ 3 BD/2 BA SINGLE FAMILY DETACHED HOME IS MOST DESIRED</div><div>+ REAR YARD WITH PRIVACY FENCING</div><div>+ WIDE DRIVEWAY WITH SHADE STRUCTURE FOR RV PARKING AND LARGE TRUCKS</div><div>+ COVERED PATIO SPACE IN OUTDOOR LIVING AREA</div><div>+ PRIVACY FENCING</div><div>+ LARGER GARAGES AND GREATER STORAGE SPACE</div></div>	<div><div></div><div>+ UPGRADE POOL AND LARGE SHADE STRUCTURE</div><div>+ MULTI-PURPOSE RECREATIONAL FACILITY (SPORTS FIELD, BASKETBALL COURT, GYM, GAME ROOM, MEETING ROOM, ETC.)</div><div>+ CENTRAL GATHERING PLACE</div><div>+ SHADE TREES WITH OWN IRRIGATION SYSTEM</div><div>+ BETTER WI-FI/INTERNET SERVICE</div><div>+ RESIDENTS WOULD LIKE SEPARATION FROM OUTSIDERS IN ORDER TO HAVE GREATER OWNERSHIP OVER AMENITIES</div><div>+ PRIORITIZE INDOOR AMENITIES DUE TO EXTREME CONDITIONS</div></div>	<div><div></div><div>+ LIMITED EMERGENCY RESPONDER AND EMS TRAINING</div><div>+ LIMITED OR NO MEDICAL SERVICES NEARBY</div></div>	<div><div></div><div>+ LIMITED ACCESS TO PRIMARY EDUCATION AND CHILDREN'S PROGRAMING MAKES IT DIFFICULT FOR FAMILIES TO LIVE REMOTE.</div><div>+ BUSSING SERVICES HAVE BEEN LIMITED.</div></div>

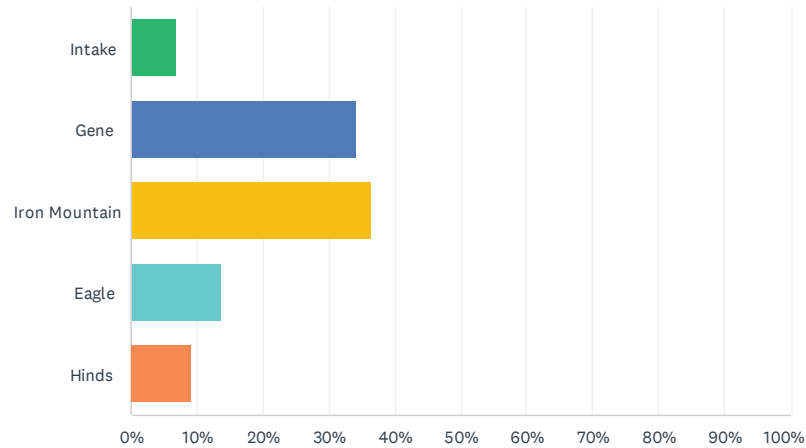
UNIQUE THEMES

INTAKE	GENE	IRON MOUNTAIN	EAGLE MOUNTAIN	JULIAN HINDS
<div><div></div><div>+ NEED HOUSING FOR REQUIRED ON-CALL STAFF TO RESPOND WITHIN 15 MINUTES</div><div>+ OPPORTUNITY FOR A RECREATION DESTINATION, SWIMMING HOLE, HAVASU LAKE, ETC.</div></div>	<div><div></div><div>+ AMENITIES ARE SEPARATED FROM THE MAIN VILLAGE</div><div>+ GYM FACILITY NEEDS TO BE MAINTAINED AND UPGRADED</div><div>+ WILD ANIMALS AND INSECTS ARE AN ISSUE</div><div>+ THE SWIMMING HOLE IS A BELOVED AMENITY. USING IT AS A CONSTRUCTION STAGING GROUND DIMINISHES IT'S SENSE OF PLACE AND MAKES EMPLOYEES FEEL LIKE THEY ARE STILL 'AT WORK'</div><div>+ MANY FOLKS CONSIDER THIS VILLAGE SHIFT HOUSING/VACATION HOUSING</div><div>+ EXISTING SOUTHERN VILLAGE HOUSING LAYOUT FEELS DISJOINTED</div></div>	<div><div></div><div>+ THE MOST REMOTE VILLAGE</div><div>+ LOGISTICS OF TRANSPORTING FOOD IS DIFFICULT, REQUIRES LARGE COOLERS AND ADDITIONAL TIME ON WAY TO WORK</div><div>+ CREATE ABILITY FOR EMPLOYEES TO PURCHASE FUEL ON-SITE</div><div>+ LONG COMMUTING TIMES FOR WORK AND SCHOOL</div><div>+ STAFFING SHORTAGE</div><div>+ THE GUN RANGE WAS THE CENTER OF THE SOCIAL COMMUNITY (IT'S THEIR BOWLING ALLEY)</div><div>+ POTENTIAL TO CREATE AN AMENITY LIKE THE SWIMMING HOLE AT GENE WITH WATER DUMPED INTO THE DESERT WHEN THEY FLUSH THE SAND TRAPS EACH WEEK.</div><div>+ EXTEND KITCHEN SERVICES DURING THE WEEKENDS</div></div>	<div><div></div><div>+ THERE ARE 2 SECURITY GATES, NORTH FROM IRON MOUNTAIN AND SOUTH FROM HINDS</div><div>+ ON-GOING ISSUES WITH WATER PRESSURE AND OTHER MAINTENANCE ISSUES</div><div>+ RESUME KITCHEN SERVICE</div><div>+ PROTECT THE CAMP BOUNDARY WITH LANDSCAPING AND TREES</div><div>+ SCHOOLING IS AVAILABLE WITHIN 10 MINUTES WITH A TRANSPORTATION SERVICE FOR K-8 STUDENTS</div></div>	<div><div></div><div>+ STRONG SENSE OF COMMUNITY</div><div>+ EXTREMELY WINDY IN WINTER SEASON</div><div>+ NEED FOR AN ACCOMMODATION FACILITY FOR GUEST AND VISITORS</div></div>



Q1 Which village do you currently work/reside?

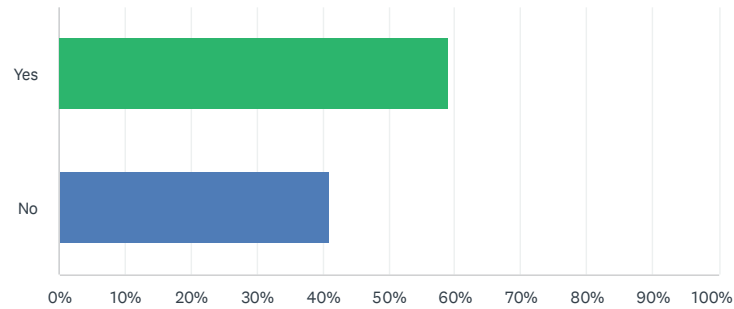
Answered: 44 Skipped: 3



ANSWER CHOICES	RESPONSES	
Intake	6.82%	3
Gene	34.09%	15
Iron Mountain	36.36%	16
Eagle	13.64%	6
Hinds	9.09%	4
TOTAL		44

Q2 Do you consider your current MWD provided housing as your primary residence? (You live on-site full-time year round)

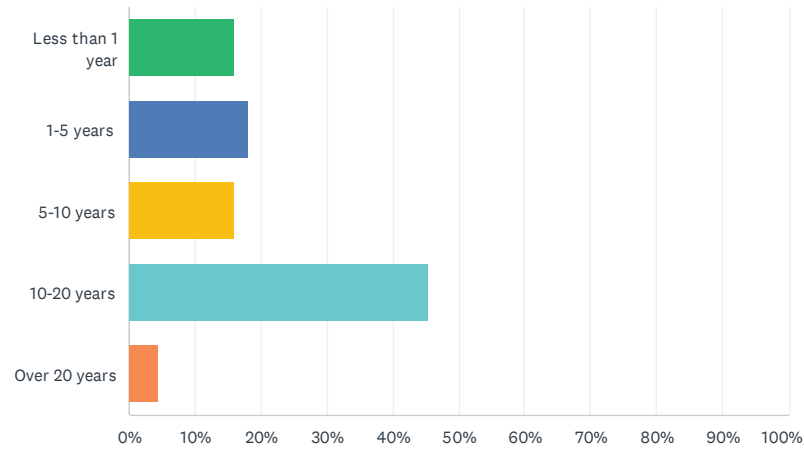
Answered: 44 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes	59.09%	26
No	40.91%	18
Total Respondents: 44		

Q3 How long have you worked for MWD at a desert village

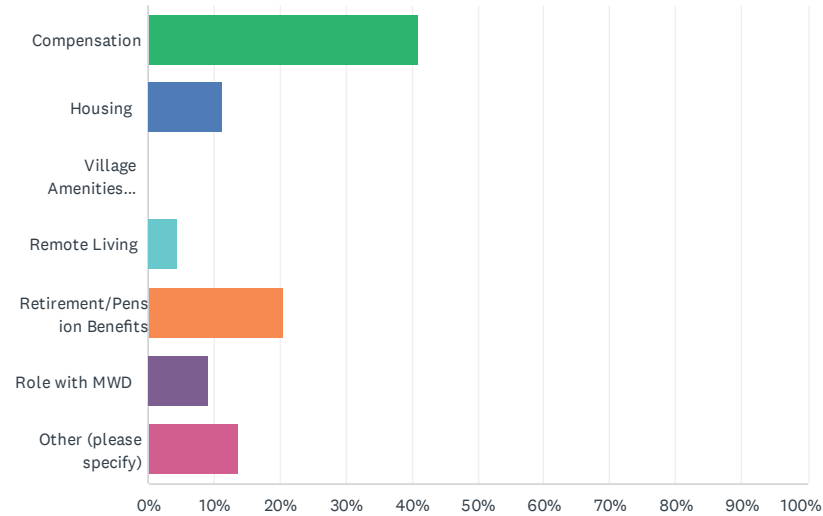
Answered: 44 Skipped: 3



ANSWER CHOICES	RESPONSES	
Less than 1 year	15.91%	7
1-5 years	18.18%	8
5-10 years	15.91%	7
10-20 years	45.45%	20
Over 20 years	4.55%	2
TOTAL		44

Q4 When you began working for MWD, what benefit was the biggest factor in you accepting the position?

Answered: 44 Skipped: 3



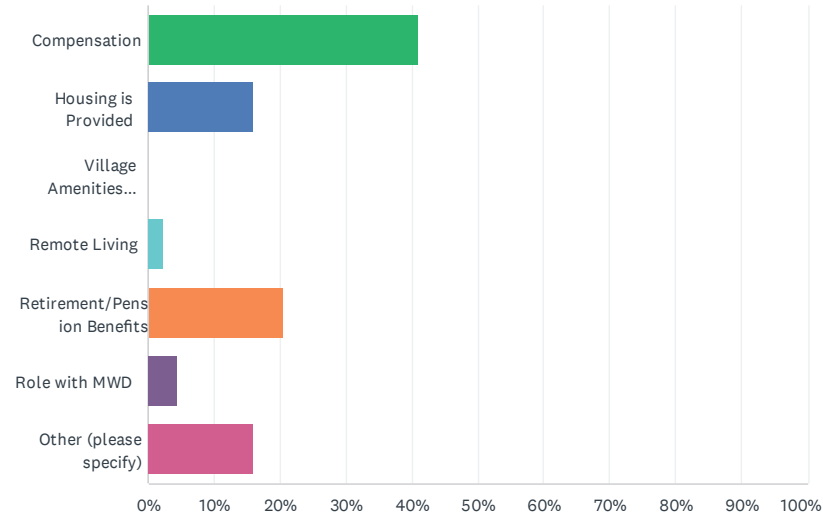
ANSWER CHOICES	RESPONSES	
Compensation	40.91%	18
Housing	11.36%	5
Village Amenities (Pool, fitness center, etc)	0.00%	0
Remote Living	4.55%	2
Retirement/Pension Benefits	20.45%	9
Role with MWD	9.09%	4
Other (please specify)	13.64%	6
TOTAL		44

#	OTHER (PLEASE SPECIFY)	DATE
1	Everything but remote living	1/24/2024 2:17 PM
2	compensation was good but housing and being able to bring my family was the deciding factor, otherwise I would not have chosen this location	1/24/2024 8:58 AM
3	Compensation was the biggest factor, but housing, amenities and retirement were biggies.	1/24/2024 7:48 AM
4	Apprenticeship program, housing was a bonus and unknow at the time I was hired.	1/24/2024 6:50 AM
5	Honestly the only thing i knew where the retirement, pension, and medical benefits. Honestly i didnt even know there was a career opportunity for me here since i have a culinary degree with	1/23/2024 1:22 PM

	15+ years restaurant and casino experience.	
6	Compensation and schedule	1/18/2024 5:21 AM

Q5 What do you think is the most important factor in attracting future employees to MWD?

Answered: 44 Skipped: 3



ANSWER CHOICES	RESPONSES	
Compensation	40.91%	18
Housing is Provided	15.91%	7
Village Amenities (Pool, fitness center, etc)	0.00%	0
Remote Living	2.27%	1
Retirement/Pension Benefits	20.45%	9
Role with MWD	4.55%	2
Other (please specify)	15.91%	7
TOTAL		44

#	OTHER (PLEASE SPECIFY)	DATE
1	Everything but remote living/it is harsh in the desert etc	1/24/2024 2:17 PM
2	Compensation and provided housing	1/24/2024 8:58 AM
3	all the above	1/24/2024 7:48 AM
4	should be able to answer more than 1, compensation/retirement benefits is why I am here	1/24/2024 7:00 AM
5	the biggest expense a family has is there home if an employee with a family or is young could try to use the saving from housing to invest and help is family move up the class ladder.	1/23/2024 1:22 PM

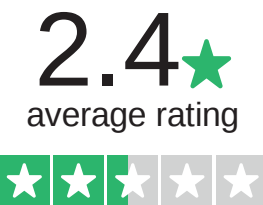
6	Combination of housing, compensation and amenities	1/23/2024 10:14 AM
7	Compensation and housing	1/18/2024 5:21 AM

Questions 6-12 refer to the strategy of having villages at Iron and Eagle only

9.2

Q6 The proposed housing strategy will attract and retain employees.

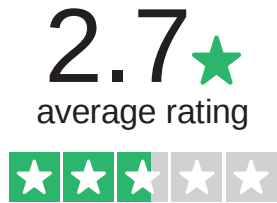
Answered: 43 Skipped: 4



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	46.51% 20	11.63% 5	18.60% 8	2.33% 1	20.93% 9	43	2.40

Q7 The proposed layout will support a strong sense of community amongst employees.

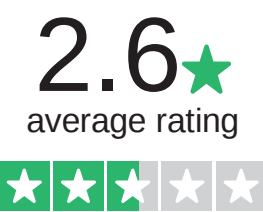
Answered: 43 Skipped: 4



	LEAST SENSE OF COMMUNITY	(NO LABEL)	(NO LABEL)	(NO LABEL)	STRONGEST SENSE OF COMMUNITY	TOTAL	WEIGHTED AVERAGE
☆	34.88% 15	18.60% 8	16.28% 7	4.65% 2	25.58% 11	43	2.67

Q8 The proposed strategy will support the long-term operations of the plants

Answered: 43 Skipped: 4

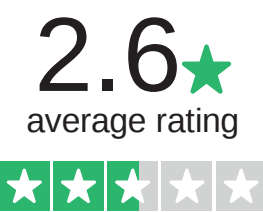


	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	39.53% 17	9.30% 4	23.26% 10	4.65% 2	23.26% 10	43	2.63

The follotion refer to the strategy of having ^{9.2}villages at Iron and Eagle only

Q9 How acceptable is commuting to Hinds and Gene when not on a 15 minute stand-by?

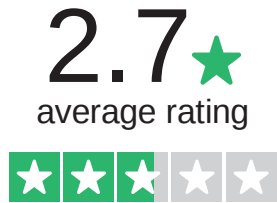
Answered: 43 Skipped: 4



	NOT ACCEPTABLE	(NO LABEL)	NEUTRAL	(NO LABEL)	ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
☆	39.53% 17	6.98% 3	23.26% 10	11.63% 5	18.60% 8	43	2.63

Q10 The proposed villages will support a safe and healthy live/work environment

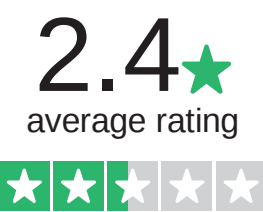
Answered: 43 Skipped: 4



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	39.53% 17	6.98% 3	20.93% 9	6.98% 3	25.58% 11	43	2.72

Q11 How acceptable is the proposed housing strategy to you as a current employee?

Answered: 43 Skipped: 4



	LEAST ACCEPTABLE	(NO LABEL)	NEUTRAL	(NO LABEL)	MOST ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
★	46.51% 20	16.28% 7	11.63% 5	2.33% 1	23.26% 10	43	2.40

Q12 Please share any other comments about this option you have below:

Answered: 40 Skipped: 7

#	RESPONSES	DATE
1	z	1/25/2024 11:15 AM
2	.	1/24/2024 2:21 PM
3	I reside at Iron. This would not change my housing situation.	1/24/2024 12:32 PM
4	NA	1/24/2024 9:26 AM
5	.	1/24/2024 9:03 AM
6	I enjoy my house at Gene. I have very few issues with it. My primary residence is in Kingman AZ. I would not be in favor short term housing at Gene for standby only. If there was short term housing for all of my days on shift that would be more appealing.	1/24/2024 7:56 AM
7	I personally would not want to have to leave Eagle to travel to Hinds every day. Furthermore, I would absolutely not want to have to go to Hinds to an apartment or whatever when on standby and then go back to my regular house when standby is over. That's too much back and forth for me.	1/24/2024 7:56 AM
8	combining Hinds and eagle would work they are close enough together for it to work.	1/24/2024 7:44 AM
9	The requirement to force every one to commute is less safe, especially on rice road. I get to choose how I utilize my district house, in this scenario I have no choice.	1/24/2024 7:03 AM
10	good job	1/24/2024 6:54 AM
11	This option will make it even harder to staff the desert facilities	1/24/2024 6:38 AM
12	0	1/24/2024 6:32 AM
13	none	1/23/2024 3:07 PM
14	MWD has tried this approach before and failed.	1/23/2024 2:38 PM
15	I would not want to work at Eagle or Iron just to get a house.	1/23/2024 2:36 PM
16	na	1/23/2024 2:33 PM
17	Desert employees were much happier with the villages years ago, with a true trades team and maintenance staff.	1/23/2024 2:29 PM
18	this is the best suggestion since the 2 remote villages are the most difficult to recruit for and it fixes those issues since it is very remote.	1/23/2024 1:26 PM
19	THE COMMUTE FROM INDIO, CA TO HINDS IS THE SAME AS LAKE HAVASU CITY, AZ TO GENE(NOT INCLUDING THE RESTRICTED HOURS OF PARKER DAM)...WHY ARE THEY TREATED DIFFERENTLY?	1/23/2024 1:07 PM
20	I BELIEVE THAT THE VILLAGES THAT ARE MOST SECURED FROM CIVILIZATION SHOULD GET THE MOST FUNDING	1/23/2024 12:47 PM
21	No comment	1/23/2024 12:26 PM
22	Just bring current housing back to acceptable standards and compensate employees appropriately. Everyone has different needs and desires for village enhancements, we will never please everyone.	1/23/2024 12:20 PM
23	This is a bad move. There needs to be a village at each location. The housing does not need to be extravagant nor does MWD need to reinvent the wheel in doing so. Simple modular homes like the several that have been already installed at all locations would more than suffice. This a very reasonable and cost-effective option. Look at what has already been done	1/23/2024 12:18 PM

	and expand on it. Employees have a sense of pride of ownership of these Desert Pump Plants, and you will destroy that mentality if we can't live where we work in these remote jobs. The village is an extension of the pump plant, and the same pride of ownership applies.	
24	Recruitment is the single biggest issue facing the Desert today. Private, single family homes are the largest recruitment magnets we currently possess. I understand they are expensive, but speaking for myself only, I would not have been able, or willing to relocate my family to the Desert without the availability of a private residence. Supply shortages in Lake Havasu City have dramatically increased the cost of housing over the last few years. It is more expensive with fewer amenities than many California cities.	1/23/2024 12:17 PM
25	Bad Idea to combine these villages	1/23/2024 12:09 PM
26	Commuting to and from Gene from iron would be time consuming. It's approximately 1.5 hours each way. Might be a good idea to provide temp housing (dorms, condos, etc.) for employees commuting to and from Gene from iron.	1/23/2024 10:17 AM
27	sdfds	1/23/2024 7:50 AM
28	Hinds instead of eagle due to closer proximity to town, decreased travel to groceries, shopping, medical facilities, etc.	1/18/2024 11:46 AM
29	No	1/18/2024 8:24 AM
30	Na	1/18/2024 7:46 AM
31	Na	1/18/2024 7:42 AM
32	Na	1/18/2024 7:39 AM
33	I believe the desert should have priority to fund allocation	1/18/2024 7:19 AM
34	Employees do not want to live in a hotel room, away from their families.	1/18/2024 6:43 AM
35	Just remodel the current houses and get rid of real property group	1/18/2024 5:25 AM
36	The money being spent on the this continued "survey" coupled with the continued "dragging of the feet" to "redeveloped" is only wasting money. NOTHING EVER gets cheaper, i.e. building material cost, labor etc.	1/18/2024 5:21 AM
37	Combining hinds and eagle isn't a terrible idea, but keep iron n gene village. Standby quarters at gene wouldn't work for me as I live to far away from gene. Not feasible to commute. Although I don't consider gene house as my primary resident. I am in the village while I am on shift. Even when I am on standby. Also I live at higher altitude, so when it's cold I will stay in the village when not on shift in the winter	1/17/2024 2:52 PM
38	People are not upset with their current housing, they are upset by the incompetence of current property management. If we had competent property management we would not be in the current situation we are in. Unfortunately until that changes everything will remain the way it is out here. Metropolitan is great at supplying water to 19 million people but cannot figure out how to manage housing for a hundred or so, it really is shameful. I realize that you are being paid to come up with a solution and have no concern for incompetent property management internally, so let's just keep trying the same thing and expecting different results.	1/12/2024 8:28 AM
39	test	1/9/2024 5:05 PM
40	ffgd	1/8/2024 12:32 PM

Questions 13-19 relate to the option of having a single village at Gene with standby housing at others

Q13 The proposed housing strategy will attract and retain employees.

Answered: 39 Skipped: 8

2.0★

average rating



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	61.54% 24	2.56% 1	17.95% 7	7.69% 3	10.26% 4	39	2.03

Q14 The proposed layout will support a strong sense of community amongst employees.

Answered: 39 Skipped: 8

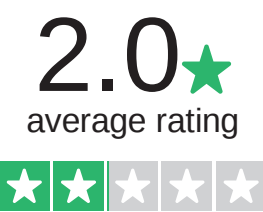
2.0★
average rating



	LEAST SENSE OF COMMUNITY	(NO LABEL)	(NO LABEL)	(NO LABEL)	STRONGEST SENSE OF COMMUNITY	TOTAL	WEIGHTED AVERAGE
☆	61.54% 24	5.13% 2	15.38% 6	5.13% 2	12.82% 5	39	2.03

Q15 The proposed strategy will support the long-term operations of the plants

Answered: 39 Skipped: 8



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	56.41% 22	7.69% 3	23.08% 9	2.56% 1	10.26% 4	39	2.03

Q16 How acceptable is commuting to Hines, Eagle, and Iron Mountain?

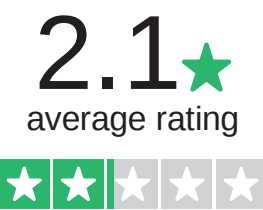
Answered: 39 Skipped: 8



	NOT ACCEPTABLE	(NO LABEL)	NEUTRAL	(NO LABEL)	ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
☆	64.10% 25	12.82% 5	10.26% 4	0.00% 0	12.82% 5	39	1.85

Q17 The proposed villages will support a safe and healthy live/work environment

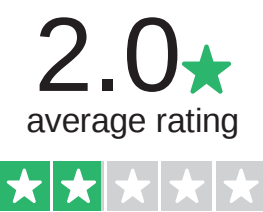
Answered: 39 Skipped: 8



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	58.97% 23	0.00% 0	23.08% 9	5.13% 2	12.82% 5	39	2.13

Q18 How acceptable is the proposed housing strategy to you as a current employee?

Answered: 39 Skipped: 8



	LEAST ACCEPTABLE	(NO LABEL)	NEUTRAL	(NO LABEL)	MOST ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
★	64.10% 25	5.13% 2	15.38% 6	2.56% 1	12.82% 5	39	1.95

Q19 Please share any other comments about this option you have below:

Answered: 36 Skipped: 11

#	RESPONSES	DATE
1	z	1/25/2024 11:16 AM
2	.	1/24/2024 2:22 PM
3	Commuting is a large waste of time and money.	1/24/2024 12:35 PM
4	na	1/24/2024 9:27 AM
5	keep it the way it is please	1/24/2024 9:05 AM
6	I would absolutely put in for a transfer out of the desert asap if this were to happen. I live in the Inland Empire and uprooting my family is not an option. My wife has her own career. My son likes his school and friends. They like to visit me when I'm on shift at Eagle...but that's about it. Thanks but no thanks.	1/24/2024 8:01 AM
7	This option will work out far better for me	1/24/2024 7:56 AM
8	In a perfect world, where management held employees accountable for their work performance, it would be great. Moving employees around sounds great for operations but moving from plant to plant will not work with this company. Plus you lose sense of ownership when you work at one plant.	1/24/2024 7:47 AM
9	Non of these solution will solve anything. The few people that live in camp, will live in camp. I see most people going to where ever there home is outside work just like current. This still forces employees to live out of hotel like rooms during the work shift. I've done it at other plants and it is not desirable.	1/24/2024 7:24 AM
10	good job	1/24/2024 6:42 AM
11	This option will also make it even harder to staff the desert facilities	1/24/2024 6:39 AM
12	0	1/24/2024 6:33 AM
13	none	1/23/2024 3:08 PM
14	I hope you can still have a house at Gene if you work at Intake because it doesn't show an arrow between them.	1/23/2024 2:41 PM
15	MWD has tried this approach before and failed.	1/23/2024 2:38 PM
16	no work will get done	1/23/2024 2:34 PM
17	To much commuting.	1/23/2024 2:29 PM
18	EVERYONE WILL WANT A SINGLE FAMILY HOME WHETHER OR NOT THEY HAVE ANOTHER RESIDENCE. THEY ARE LYING IF THEY SAY OTHERWISE. PEOPLE WILL WANT WHAT EVERYONE ELSE GETS INCLUDING MYSELF. USING SOMEONES PERSONAL ADDRESS TO ASSIGN HOUSING IS DISCRIMINATION. GET OUT OF PEOPLES PERSONAL LIVES.	1/23/2024 1:36 PM
19	This plan might pose an issue simply due to the unknow weather conditions. What would happen if the roads get shut due to the rain or an accident. and there is an emergency in any of the plants.	1/23/2024 1:30 PM
20	YOU WOULD HAVE TO PAY THE PEOPLE THAT ARE BEING SENT TO COMMUTE TO THE DESERT A LOT OF MONEY FOR THIS TO WORK	1/23/2024 12:48 PM
21	These plants need ample (i.e. Daily) maintenance and care taking, to continue its storied reliability with all of its aging assets, losing 4 hours a day to drive time seems awfully inefficient for maintenance and unfair to the rate payers as they are paying for us to travel several hours everyday to respond to scheduled or worst unscheduled emergencies. The	1/23/2024 12:38 PM

9-2

current villages offer some flexibility with this as some employees can be called into action with very little down time provided they are in the village. Many of our families reside in California so this idea takes us even farther away from them. And what does "Hotel Style" actually mean? This seems like it could negatively affect budgeting as hotel infers housekeeping, entertainment, laundry, and food service options. All of which bring with them labor needs and additional skillsets and assets; Refrigeration, commissary, inventory controls, menu management etc. Items that we fall short on as it is with our small hospitality sector.

22	This is challenging to answer because it is so dependent on the dynamics of the individual employee and their families. Some families are okay with a parent being away two weeks per month. Others are not (still others are single). Speaking only for myself, my wife and children would find this unacceptable as a long-term option and we would be searching for a job away from the Desert (though hopefully still with MWD). If commute time was 'on the clock' it would make the commutes more palatable but would also be a continual business cost.	1/23/2024 12:28 PM
23	This is a bad move. There needs to be a village at each location. The housing does not need to be extravagant nor does MWD need to reinvent the wheel in doing so. Simple modular homes like the several that have been already installed at all locations would more than suffice. This a very reasonable and cost-effective option. Look at what has already been done and expand on it. Employees have a sense of pride of ownership of these Desert Pump Plants, and you will destroy that mentality if we can't live where we work in these remote jobs. The village is an extension of the pump plant, and the same pride of ownership applies.	1/23/2024 12:18 PM
24	Bad Idea	1/23/2024 12:09 PM
25	Travel time from Gene would be too much in my opinion. Centralized villages make more sense	1/23/2024 10:19 AM
26	dsfds	1/23/2024 7:51 AM
27	Does nothing to help with employee retention down line of Gene pump plant	1/18/2024 11:47 AM
28	Na	1/18/2024 7:47 AM
29	Na	1/18/2024 7:40 AM
30	You would have to heavily compensate employees that work at desert plants for this to work.	1/18/2024 7:20 AM
31	This will create chaos at the plants. Recruitment will be even more difficult.	1/18/2024 6:46 AM
32	Abc	1/18/2024 5:22 AM
33	In a perfect world where all employees do their part. It may work. Just think you lose your sense of ownership to the plant you work at. Don't think it will work.	1/17/2024 2:54 PM
34	Not everyone wants to live at Gene or Havasu, myself included and if the goal is employee retention this seems off the mark.	1/12/2024 8:42 AM
35	test	1/9/2024 5:03 PM
36	sdfadsaf	1/8/2024 12:32 PM

Q20 The proposed housing strategy will attract and retain employees.

Answered: 35 Skipped: 12

1.9★

average rating



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	62.86% 22	8.57% 3	11.43% 4	5.71% 2	11.43% 4	35	1.94

Questions 21-26 relate to the option of extended stay only at all plants.

Q21 The proposed layout will support a strong sense of community amongst employees.

Answered: 35 Skipped: 12



	LEAST SENSE OF COMMUNITY	(NO LABEL)	(NO LABEL)	(NO LABEL)	STRONGEST SENSE OF COMMUNITY	TOTAL	WEIGHTED AVERAGE
★	71.43% 25	8.57% 3	11.43% 4	2.86% 1	5.71% 2	35	1.63

Q22 The proposed strategy will support the long-term operations of the plants

Answered: 35 Skipped: 12



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	62.86% 22	8.57% 3	11.43% 4	5.71% 2	11.43% 4	35	1.94

Q23 How acceptable is commuting to all camps?

Answered: 35 Skipped: 12



	NOT ACCEPTABLE	(NO LABEL)	NEUTRAL	(NO LABEL)	ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
☆	65.71% 23	8.57% 3	11.43% 4	5.71% 2	8.57% 3	35	1.83

Q24 The proposed villages will support a safe and healthy live/work environment

Answered: 35 Skipped: 12



	STRONGLY DISAGREE	(NO LABEL)	NEUTRAL	(NO LABEL)	STRONGLY AGREE	TOTAL	WEIGHTED AVERAGE
☆	62.86% 22	5.71% 2	17.14% 6	5.71% 2	8.57% 3	35	1.91

Q25 How acceptable is the proposed housing strategy to you as a current employee?

Answered: 35 Skipped: 12



	LEAST ACCEPTABLE	(NO LABEL)	NEUTRAL	(NO LABEL)	MOST ACCEPTABLE	TOTAL	WEIGHTED AVERAGE
★	71.43% 25	2.86% 1	8.57% 3	8.57% 3	8.57% 3	35	1.80

Q26 Please share any other comments about this option you have below:

Answered: 32 Skipped: 15

#	RESPONSES	DATE
1	.	1/24/2024 2:23 PM
2	.	1/24/2024 12:37 PM
3	na	1/24/2024 9:30 AM
4	Separating families will make people want to leave more than what we are facing, There is a decent trade off right now. If I was not offered a position with a house were I was able to bring my family, I would not have accepted the position.	1/24/2024 9:13 AM
5	I could get by with a two bedroom home but don't like the condo idea. There's no room for my family when they come out during their vacations.	1/24/2024 8:04 AM
6	Eh do i need to explain. this may work for some people. The ones that don't want to spend time with their families.	1/24/2024 7:49 AM
7	One bedroom units so I cant even bring my kids? I also have to live out of a hotel room. Just fix the existing housing, its not that hard, and maybe don't defer maintenance for 30 years resulting in the problems we are dealing with now.	1/24/2024 7:30 AM
8	good job	1/24/2024 6:42 AM
9	Seriously....	1/24/2024 6:40 AM
10	0	1/24/2024 6:34 AM
11	none	1/23/2024 3:08 PM
12	I need my family with me.	1/23/2024 2:43 PM
13	Not a viable solution. No thought to employee. Will hurt recruitment.	1/23/2024 2:39 PM
14	na	1/23/2024 2:34 PM
15	One must be able to separate work/life with a feeling of ownership stimulating the sense of value and pride in your place.	1/23/2024 2:32 PM
16	IF YOU PAY SOMEONE ENOUGH, THEY WILL TRAVEL 2 HOURS TO AND FROM EVERY DAY. THIS SURVEY IS A JOKE. WHY DON'T YOU ASK WHAT CAN BE DONE IN 75 DAYS??	1/23/2024 1:46 PM
17	This one could work, issue is if an employee is family oriented and need to be near or close to their family.	1/23/2024 1:33 PM
18	This option would make it very challenging for employees who wish to live with their families. Would these units be temporarily assigned? Rotated through staff? Would they require additional maintenance staff to clean and maintain?	1/23/2024 12:51 PM
19	YOU WOULD HAVE TO PAY PEOPLE A LOT OF MONEY FOR THIS TO WORK	1/23/2024 12:49 PM
20	If you want employees who are invested in the success of the plants and the CRA as a whole it behooves the company to understand the current challenges and mitigate them, not compound them. Working and living remote is already a challenge so why increase the isolation?	1/23/2024 12:38 PM
21	This is a bad move. There needs to be a village at each location. The housing does not need to be extravagant nor does MWD need to reinvent the wheel in doing so. Simple modular homes like the several that have been already installed at all locations would more than suffice. This a very reasonable and cost-effective option. Look at what has already been done and expand on it. Employees have a sense of pride of ownership of these Desert Pump	1/23/2024 12:19 PM

9-2

Plants, and you will destroy that mentality if we can't live where we work in these remote jobs. The village is an extension of the pump plant, and the same pride of ownership applies.

22	The as an apartment terrible idea. I lived in apartment building all my life and they are not ideal with very little privacy.	1/23/2024 12:11 PM
23	Won't be popular with current employees but I think this is the best option going forward.	1/23/2024 10:21 AM
24	What demographic is MWD seeking, and will these employees stay here long term ? Highly doubt	1/18/2024 11:49 AM
25	Na	1/18/2024 7:48 AM
26	Na	1/18/2024 7:42 AM
27	I would rather get a new job then do this.	1/18/2024 7:21 AM
28	This will only be an attractive design to people without families. Most people don't want to be away from family for eight days at a time, twice per month or more.	1/18/2024 6:50 AM
29	Abc	1/18/2024 5:22 AM
30	If you didn't have a hard time finding competent employees this would work	1/17/2024 2:56 PM
31	This might be a good fit for people who just want to come and work a shift and leave, however it might not appeal to all. I lived in extended stay hotels on the road working for 8 years and a house is more appealing than a hotel room.	1/12/2024 8:44 AM
32	test	1/9/2024 4:59 PM

PROJECT PARAMETERS

• POTENTIAL HOUSING TYPOLOGIES	66
• POTENTIAL AMENITY TYPOLOGIES	67
• POTENTIAL PROGRAMMATIC TYPOLOGIES	68
• CONSTRUCTION TYPE RESEARCH	71



PROJECT PARAMETERS

PROJECT PARAMETERS HAS BEEN ESTABLISHED BASED UPON OBSERVATIONS OF COMMUNITY NEEDS AFTER THE SITE VISITS AND COMMUNITY INTERVIEWS.

PARAMETERS GUIDE TO DEVELOPMENT OF GUIDING PRINCIPLES AND PROGRAMS THAT COULD CONCEPTUALLY WORK FOR COMMUNITY.



POTENTIAL HOUSING TYPOLOGIES

ACCORDING TO COMMUNITY FEEDBACK



SINGLE FAMILY HOUSING
SINGLE FAMILY DETACHED WITH 2 CAR GARAGE



EXTENDED-STAY TOWNHOME
MULTI-FAMILY HOUSING WITH INDIVIDUAL FRONT DOOR, 1BD W/ KITCHEN SUITE



GUEST HOTEL
MOTEL ROOM



ALTERNATIVE EXTENDED-STAY HOUSING TYPES:



CASITA



RV SITES W/HOOKUPS
USE OF PERSONAL RV'S FOR HOUSING



POTENTIAL AMENITY TYPOLOGIES

ACCORDING TO COMMUNITY FEEDBACK



SWIMMING POOL
SHADED AND SCREENED



**SHADED MODERN EQUIPMENT
PLAYGROUND**



ARCHERY RANGE



RESIDENT GAME ROOM
SEPARATE FROM DINING HALL



COMMUNITY MEETING ROOM



**MULTI PURPOSE INDOOR
RECREATIONAL FACILITY**
BASKETBALL / SPORTS FIELDS / TRACK
FITNESS ROOM / ENTERTAINMENT ROOM, ETC.



RESIDENT FITNESS CENTER



GUEST GYM
WEIGHTS AND CARDIO



**IMPROVED STREETScape AND
BEAUTIFICATION**
TREES (PROVIDE SHADE FOR YARDS AND HOMES)
WALKING PATHS
COMMUNITY OPEN SPACES



AUTOMOTIVE STORAGE
CAR PORTS AT HOUSES
COMMON COVERED VEHICLE STORAGE FACILITY
LARGE GARAGES (TO FIT TRUCKS)
TWO CAR GARAGE



**COMMERCIAL KITCHEN /
DINING FACILITY**



SHARED COMMUNITY WORKSHOP
SHARED AUTOMOTIVE REPAIR GARAGE
WOODWORKING



POTENTIAL PROGRAMMATIC TYPOLOGIES

ACCORDING TO COMMUNITY FEEDBACK



ONE VILLAGE CONTRACT FOR COMMON SPACE AND PRIVATE YARD MAINTENANCE

INCLUDE BACKYARD IN MAINTENANCE PROGRAM
MAINTAIN VACANT HOMES OR YARDS WHEN
PEOPLE ARE OFF SHIFT



STREETSCAPE AND PUBLIC SPACE BEAUTIFICATION

REALIGNMENT OF STREETS TO SEPARATE NEIGHBORHOOD FROM
CONTRACTOR/WORK TRAFFIC
VIEWS TO DESERT LANDSCAPE PREFERRED



VILLAGE STORE WITH PERISHABLE STAPLES FOR PURCHASE (MILK, EGGS, BREAD, ETC.)

CAN BE COMBINED WITH KITCHEN ORDERS AND SIMILAR PRODUCTS







KITCHEN OPEN ON WEEKENDS







STARLINK TECHNOLOGY / BETTER INTERNET SERVICE

HOUSING TYPOLOGIES EXPLORED PRIOR TO PLANNING EFFORT (THROUGH JUNE 2023)

HOUSING TYPE		SINGLE FAMILY DETACHED				SINGLE FAMILY ATTACHED			REMODEL EXISTING HOUSES		TEMPORARY ACCOMMODATION
		Current Design	Lower Cost Single	Courtyard Design	Manufactured Home	2-story Duplex	Duplex	Triplex/Quadplex	Full Remodel and Additions	Partial Remodel	Lodge/Hotel
EXAMPLE											
PRINCIPLE BUILDING	Living Area	± 1,350 sq.ft.	± 1,350 sq.ft.	± 1,350 sq.ft.	± 1,400 sq.ft.	± 1,350 sq.ft.	± 1,350 sq.ft.	± 1,350 sq.ft.	± 1,000 - 1,400 sq.ft.	± 1,000 - 1,400 sq.ft.	350-450 sq.ft. per room
	Number of Bedroom/ Bathroom	3 bd / 2 ba	3 bd / 2 ba	3 bd / 2 ba	3 bd / 2 ba	3 bd / 2 ba	3 bd / 2 ba	3 bd / 2 ba	3 bd / 2 ba 2 bd / 2 ba	3 bd / 2 ba 2 bd / 2 ba	1 bd / 1 ba
VEHICLE STORAGE	Type	Attached	Attached	Detached 2-Car	Detached 2-Car	Attached	Attached	Attached	Attached / Detached	Attached / Detached	Detached Parking Lot
	Occupiable space	± 420 sq.ft. (19'x22')	± 420 sq.ft. (19'x22')	± 420 sq.ft. (19'x22')	± 50 sq.ft. (20'x25')	± 420 sq.ft. (19'x22')	± 420 sq.ft. (19'x22')	± 420 sq.ft. (19'x22')	± 300 (14'x22') - 440 (20'x22') sq.ft.	± 300 (14'x22') - 440 (20'x22') sq.ft.	-
	Number of vehicles	2	2	2	2	2	2	2	2	2	1 parking stall
COST PER UNIT		\$1,050,000	\$635,000	\$712,000	\$510,000 plus assumed \$35,000 foundation	\$621,000	\$609,000	not priced	\$740,000 to 800,000	\$350,000 to 380,000	\$670,000
COST OPINION DATE		April 2022	Dec 2020	Dec 2020	2018	Dec 2020	Dec 2020	Nov 2020	Dec 2019	Dec 2019	June 2023
COST MULTIPLIER (DGS CONSTRUCTION COST INDEX)		9654/8903	9654/6995	9654/6995	9654/6598	9654/6995	9654/6995	-	9654/6684	9654/6684	9654/9508
CURRENT COST PER UNIT (OCT 2023)		\$1,140,000	\$880,000	\$980,000	\$790,000	\$860,000	\$840,000	-	\$1,070,000 to 1,160,000	\$510,000 to \$550,000	\$680,000
CONSTRUCTION TYPE		Traditional stick frame or modular	Traditional stick frame	Traditional stick frame	Manufactured home	Traditional stick frame	Traditional stick frame	Traditional stick frame	Traditional stick frame or masonry	Traditional stick frame or masonry	Traditional stick frame
NOTES		<ul style="list-style-type: none">costs are average among villages and account for remote locationsassumes prevailing wage requirements and public bidcost is for building only, does not include sitework / landscaping / infrastructure	<ul style="list-style-type: none">Includes garage A/C, mudroom with shower and laundry, metal roof, covered patios, HVAC for 120F design temp		<ul style="list-style-type: none">Cost per MWD, based on units installed in 2018. Foundation work was performed by MWD personnel.			<ul style="list-style-type: none">Eliminated from consideration prior to cost estimation effort, as such a large building fit poorly on available lots in existing villages	<ul style="list-style-type: none">Incl. items listed for Partial Remodel, plus:Add Covered Patio (200 SF instead of 120 SF)Structural RetrofitGarage Expansion and A/CCarport	<ul style="list-style-type: none">Add Covered Patio (120 SF)Add bathroomRemodel interior; upgrade HVAC/ electricalReplace RoofingAdd sun controlExterior refinishing	<ul style="list-style-type: none">Pricing includes Dining facility, Fitness room, and Community Room, and assumes 60 rooms share the cost of these amenities
PROS		<ul style="list-style-type: none">Maintains current housing strategyPrivacyComfort	<ul style="list-style-type: none">Maintains current housing strategyPrivacy	<ul style="list-style-type: none">Maintains current housing strategyPrivacy	<ul style="list-style-type: none">Maintains current housing strategyPrivacyLower initial cost	<ul style="list-style-type: none">Some cost savings due to more compact development	<ul style="list-style-type: none">Some cost savings due to more compact development	<ul style="list-style-type: none">Some cost savings due to more compact development	<ul style="list-style-type: none">Maintains current housing strategyPrivacy	<ul style="list-style-type: none">Maintains current housing strategyPrivacy	<ul style="list-style-type: none">Minimal cost for housing accommodations
CONS		<ul style="list-style-type: none">Initial Cost	<ul style="list-style-type: none">Maintenance of shingle roof	<ul style="list-style-type: none">Maintenance of shingle roof	<ul style="list-style-type: none">Very high maintenance cost (reports of early failure of interior and exterior finishes and cabinetry)Less comfortable (inferior insulation, no backyard access, small porch)	<ul style="list-style-type: none">Shared wallMaintenance of shingle roof	<ul style="list-style-type: none">Shared wallMaintenance of shingle roof	<ul style="list-style-type: none">Shared walls with multiple neighborsDoes not fit well on available lots, especially when phasing is considered	<ul style="list-style-type: none">Poor value - new houses can be constructed for the cost of renovating existingLack of standardization and equity among existing residences	<ul style="list-style-type: none">Lack of standardization and equity among existing residences	<ul style="list-style-type: none">Regular cleaning and maintenancePotentially long and difficult staffing transition from employees who rent houses to those who will stay in lodging

AMENITY TYPOLOGIES EXPLORED PRIOR TO PLANNING EFFORT (THROUGH JUNE 2023)

AMENITY TYPE	CLUBHOUSES		KITCHENS		LODGES		SITE AMENITIES AND SITEWORK			
	Large	Small	Large	Small	Large	Small	Hinds	Eagle	Iron	Gene
EXAMPLE										
AREA	± 2,400 sq.ft.	± 1,900 sq.ft.	± 4,900 sq.ft.	± 4,300 sq.ft.	± 9,800 sq.ft.	± 7,000 sq.ft.	± 370,000 sq.ft.	± 780,000 sq.ft.	± 770,000 sq.ft.	± 960,000 sq.ft.
COST	\$1,830,000	\$1,460,000	\$4,770,000	\$4,230,000	\$6,990,000	\$5,210,000	\$9,840,000	\$13,730,000	\$17,530,000	\$19,630,000
COST OPINION DATE	April 2022									
COST MULTIPLIER (DGS CONSTRUCTION COST INDEX)	9654/8903									
CURRENT COST (OCT 2023)	\$1,980,000	\$1,580,000	\$5,170,000	\$4,590,000	\$7,580,000	\$5,650,000	\$10,670,000	\$14,890,000	\$19,010,000	\$21,290,000
COST PER SF	\$825	\$830	\$1,055	\$1,070	\$775	\$810	\$29	\$19	\$25	\$22
CONSTRUCTION TYPE	Traditional wood frame or modular	Traditional wood frame or modular	PEMB canopy with wood frame infill beneath	PEMB canopy with wood frame infill beneath	PEMB canopy with wood frame infill beneath	PEMB canopy with wood frame infill beneath	Steel framed and CMU site structures			
NOTES	<ul style="list-style-type: none">costs account for remote locationsassumes prevailing wage requirements and public bidbuilding costs are for building only, does not include sitework / landscaping / infrastructure	<ul style="list-style-type: none">Planned to serve the residents of 10-20 housesCommon room 1,000 SFFitness room 700 SFMisc office, storage, and utility roomsLarge attached exterior shade canopy	<ul style="list-style-type: none">Planned to serve the residents of 30-35 housesCommon room 800 SFFitness room 550 SFMisc office, storage, and utility roomsLarge attached exterior shade canopy	<ul style="list-style-type: none">Dining room 1,200 SF to accommodate 40 people and meeting room use (30 SF each)Kitchen 1,200 SF to accommodate production of boxed lunches as well as dining hall capacityKitchen storage 700 SF (refrigerated, frozen, and dry) to accommodate one deliver per weekGrab and go area for boxed lunches, ice, and drinksMisc office, storage, and utility rooms	<ul style="list-style-type: none">Dining room 1,400 SF to accommodate 50-60 people and meeting room use (30 SF each)Kitchen 800 SF to accommodate production of boxed lunches as well as dining hall capacityKitchen storage 700 SF (refrigerated, frozen, and dry) to accommodate one deliver per weekGrab and go area for boxed lunches, ice, and drinksMisc office, storage, and utility rooms	<ul style="list-style-type: none">25 guest rooms (studio configuration, no kitchenette)Common area Lounge and Kitchenette 1,000 SFSmall guest laundryOn-site linen laundry	<ul style="list-style-type: none">15 guest rooms (studio configuration, no kitchenette)Common area Lounge and Kitchenette 1,000 SFSmall guest laundryOn-site linen laundry	<ul style="list-style-type: none">Represents a complete overhaul of all exterior areas, including common areas and residence yardsRoad repavingWalking pathsPlaygroundLandscaping (village common areas and minimal landscaping at residence yards)Trash enclosuresParking lot PV shade structuresTennis/basketball sport courtRenovation of existing pool, and new shade structure at poolNew sitewide pedestrian lightingCommunity dog runDoes NOT include replacement of existing sitewide utilities		

Construction Types Research (preliminary / draft)

11/27/23 RNT Architects

Building Type:	Traditional (site-built)	Modular	3D Printed	Manufactured
Code Requirements	California Building Standards code and local codes, last updated 2022			HUD Code (US Dep't of Housing and Urban Development Code,) last updated 1994
Energy Efficiency and Comfort	Meets California Title 24 standards (approx R-21 wall insulation and R-38 attic insulation)			Meets HUD standards. If constructed to Energy Star ("upgraded") standards, it would have R-11 wall insulation and R-30 attic insulation, which is still far less robust than homes built to meet California Title 24.
Water Efficiency	Meets California water efficient fixture requirements			Less stringent water efficiency requirements.
Customization	Custom design can respond to climate and user needs			Choose from stock plans with limited customization
Durability	Expected to last over 50 years. Similar risks for site-built and modular housing are reflected in similar insurance policy premiums and market appreciation.		Highest durability; expected to last 100 years and at least one company offers a 50 year warranty. One company cites potential insurance savings. Exterior walls are concrete, which is very durable and fire resistant.	Expected to last 30-55 years per HUD. Higher risks of damage from burst pipes and wind are reflected in higher insurance policy premiums.
Occupant Health	Must comply with California code requirements for low emissions of toxic VOCs (volatile organic compounds) such as formaldehyde.		Must comply with California code requirements for low emissions of toxic VOCs (volatile organic compounds) such as formaldehyde. Additionally, construction is very resistant to mold and termites.	No limits on VOCs such as formaldehyde, which are commonly used in building materials
Occupant Safety	Basic safety considerations such as smoke detectors, fire sprinklers, and emergency egress windows are required. Engineered to withstand weather and earthquake events.			
Construction Site Safety	Higher risks of heat-related illness.	Controlled environment minimizes heat-related illness and accidents during factory construction. Risks related to crane placement of modules on-site.	Few workers required for construction of building shell, thereby minimizing heat-related illness and accidents.	Controlled environment minimizes heat-related illness and accidents during factory construction. Risks related to crane placement of modules on-site.
Predictability of Process	Risks of delay and decreased productivity due to rain days, heat index days, high winds, and challenges related to site remoteness and environmental conditions.	Risks reduced due to majority of construction accomplished under controlled conditions. Less reliance on subcontractor availability, as modular construction is typically accomplished in-house by full-time employees.	Potential time delay and financial risks of pioneering the permitting process for a construction method that may be new to the local jurisdictions (first permitted 3d printed homes were completed in California this year.) Companies in this space are startups and have only been around for a few years. 3D printing can be challenging in hot or cold weather and therefore may be subject to delays. MEP trades still must travel to the site for most 3d printed methods. However, this is a rapidly-evolving field, and at least one company is producing pre-printed modular panels that are being assembled on-site in Desert Hot Springs (expected to be completed 2023.)	Risks reduced due to majority of construction accomplished under controlled conditions. Less reliance on subcontractor availability, as modular construction is typically accomplished in-house by full-time employees.
Delivery Method	Design-bid-build or design-build (most flexible)	Design-build would be preferred, but bid can be accommodated.	Design-build is likely preferred, although conversations with manufacturers are needed for verification. It appears that 3d printing companies have their own in-house engineers and proprietary material properties.	Design-build would be preferred, but bid can be accommodated.
Speed and Disruption	Each phase of housing will likely take 6 to 8 months to complete, accounting for restrictions on work hours due to weather and proximity of occupied houses.	Off-site construction of the house can proceed simultaneously with on-site construction of the foundation, cutting total construction time (and related tenant disruption) by 20% or more.	House is typically constructed on-site, but is significantly less disruptive (less framing noise, fewer workers) than traditional construction. Speed is faster than site-built construction.	Off-site construction of the house can proceed simultaneously with on-site construction of the foundation, cutting total construction time (and related tenant disruption) by 20% or more.
Cost	Assumed baseline	Approx 3% savings	Unclear; manufacturers claim savings but do not specify a range	Potentially 10% savings but construction not comparable

VILLAGE ORGANIZATION STRATEGIES

• INITIAL VILLAGE STRATEGIES, DECEMBER 2023	73
• REFINED VILLAGE STRATEGIES, FEBRUARY, 2024	88
• FINAL VILLAGE STRATEGIES, MAY, 2024	100



INITIAL
VILLAGE STRATEGIES

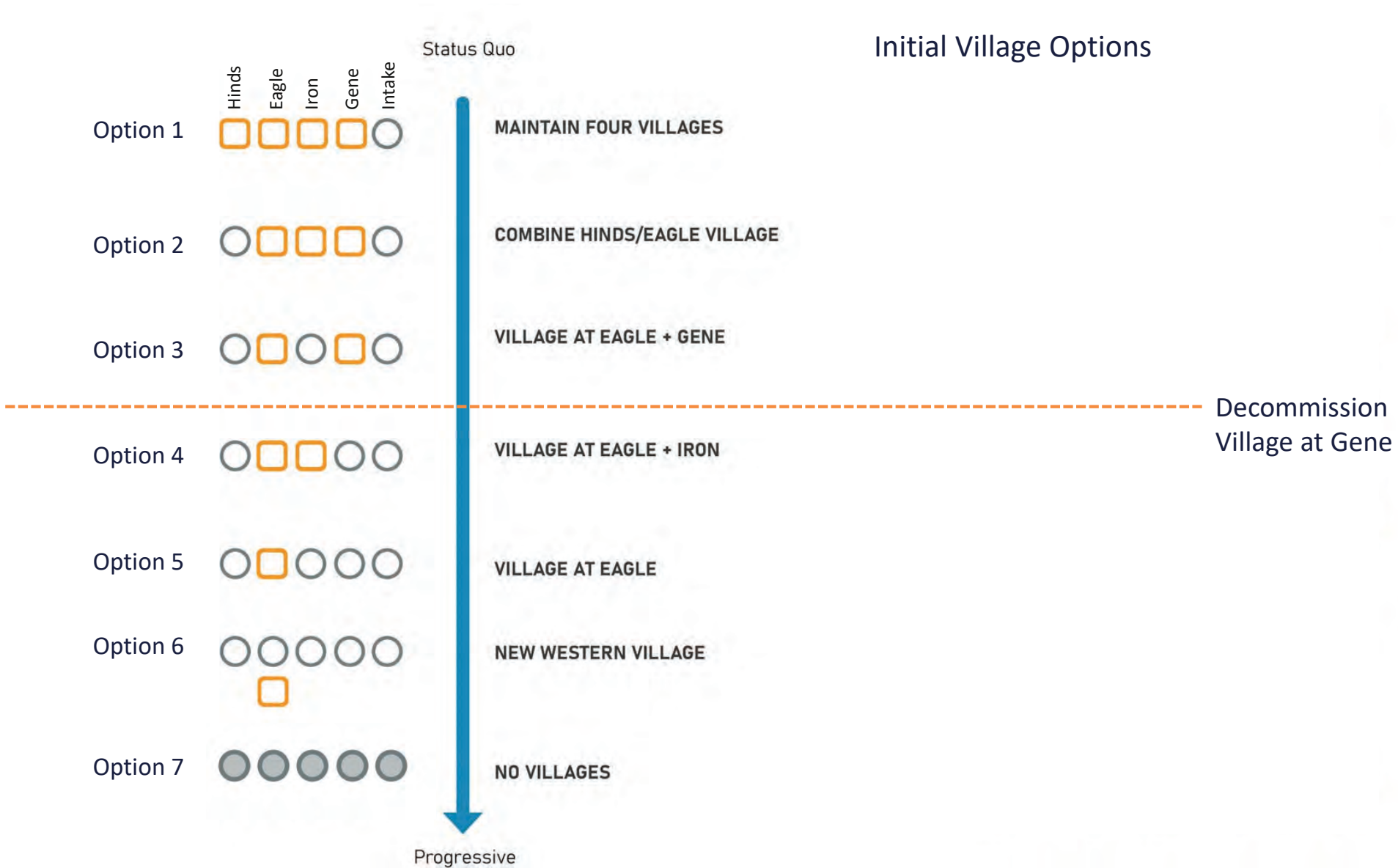
Purpose

This effort explores what the next 75 years of living & working will be in the remote villages and pumping plants, as Metropolitan considers a strategy to attract & retain current & future generations of Desert employees.

- Validate previous work, discover areas requiring refinement, or set a new direction for future desert villages
- Consider long term sustainability & resiliency of Desert villages

Guiding Principles

- Support the **long-term operation** of the critical CRA infrastructure
- Create a **financially resilient and socially sustainable 75-year** desert village strategy.
- Provide standard of living that **supports employee recruitment, retention, and satisfaction.**
- Create **safe and healthy** villages
- Provide a mix of housing types and amenities.



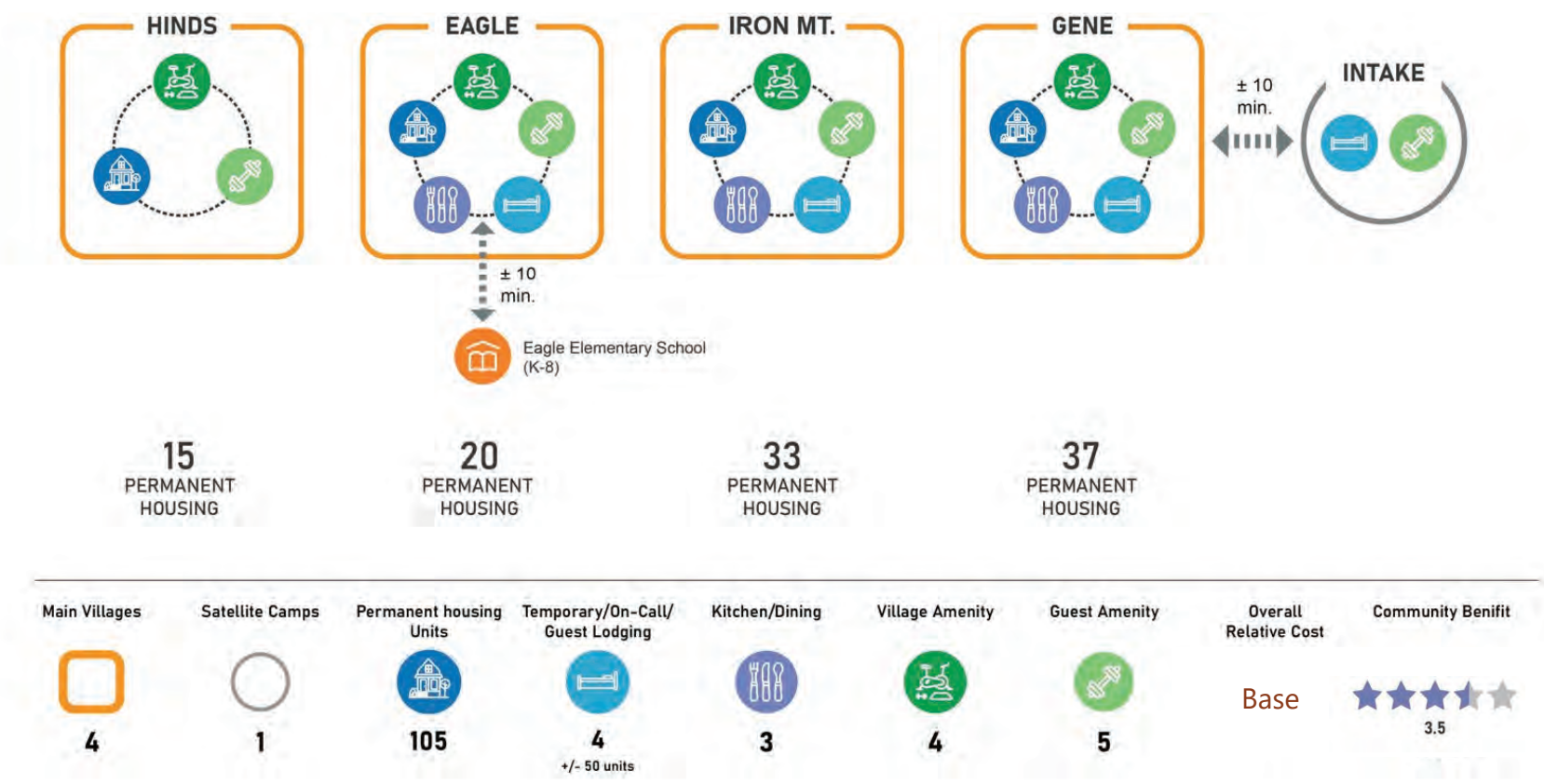
Scenario	Description	Relative Cost ¹	
Scenario 1	Upgrade 4 Villages	Base	
Scenario 2	Three Villages	Base	plus 3%
Scenario 3	Two Villages	Base	plus 3%
Scenario 4	Two Western Villages / Decommission Gene	Base	less 22%
Scenario 5	One Western Village / Decommission Gene	Base	less 21%
Scenario 6	One NEW Western Village	Base	less 14%
Scenario 7	No Villages (hotel model)	Base	less 24%

Note:

1. The components included in these scenarios have evolved, as these numbers don't match the final estimates.

SCENARIO 1: FOUR VILLAGES

UPGRADE EXISTING VILLAGES



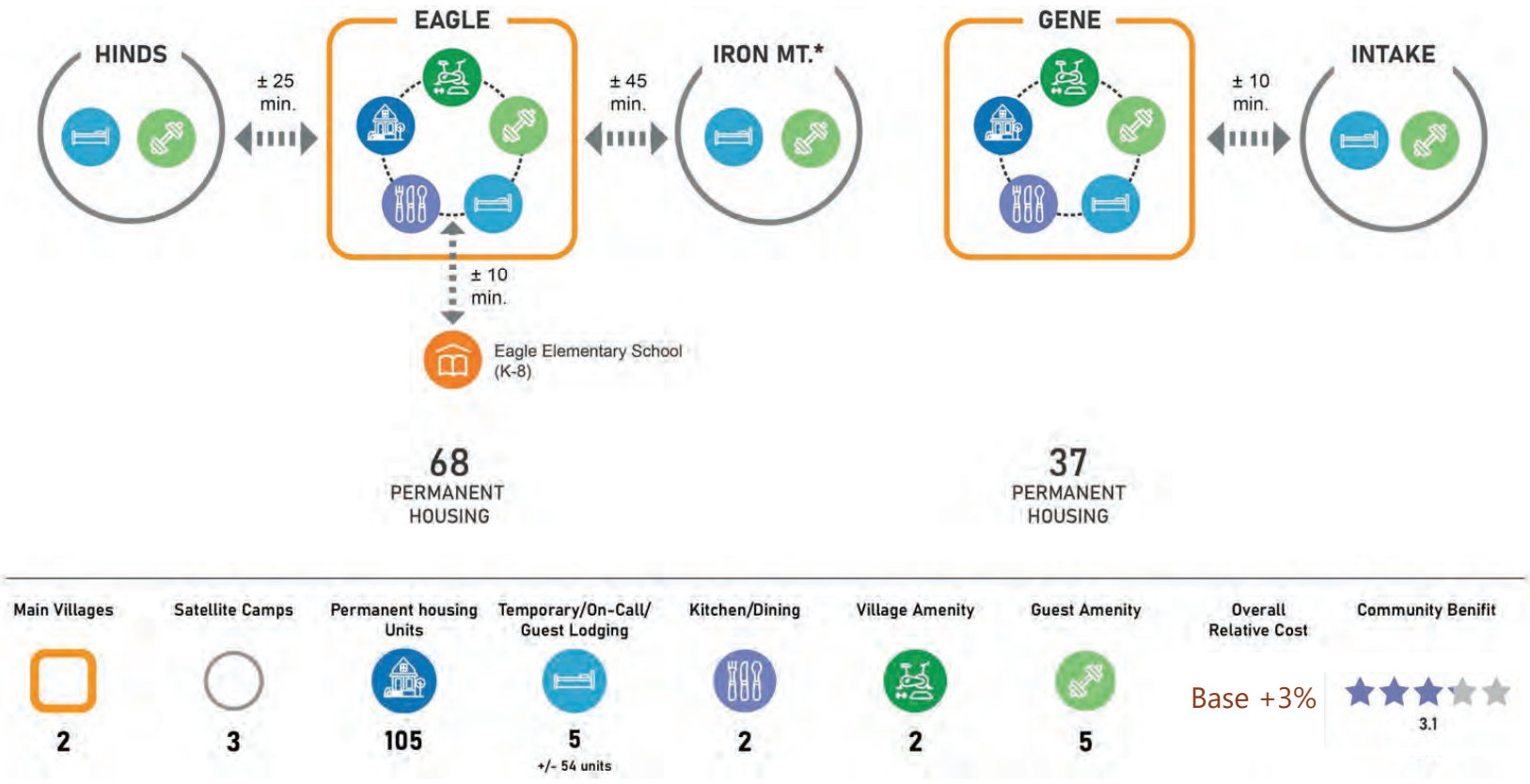
SCENARIO 2: THREE VILLAGES

UPGRADE EXISTING VILLAGES (GENE AND IRON MT.) AND CONSOLIDATE HINDS AND EAGLE MT. INTO A SINGLE VILLAGE



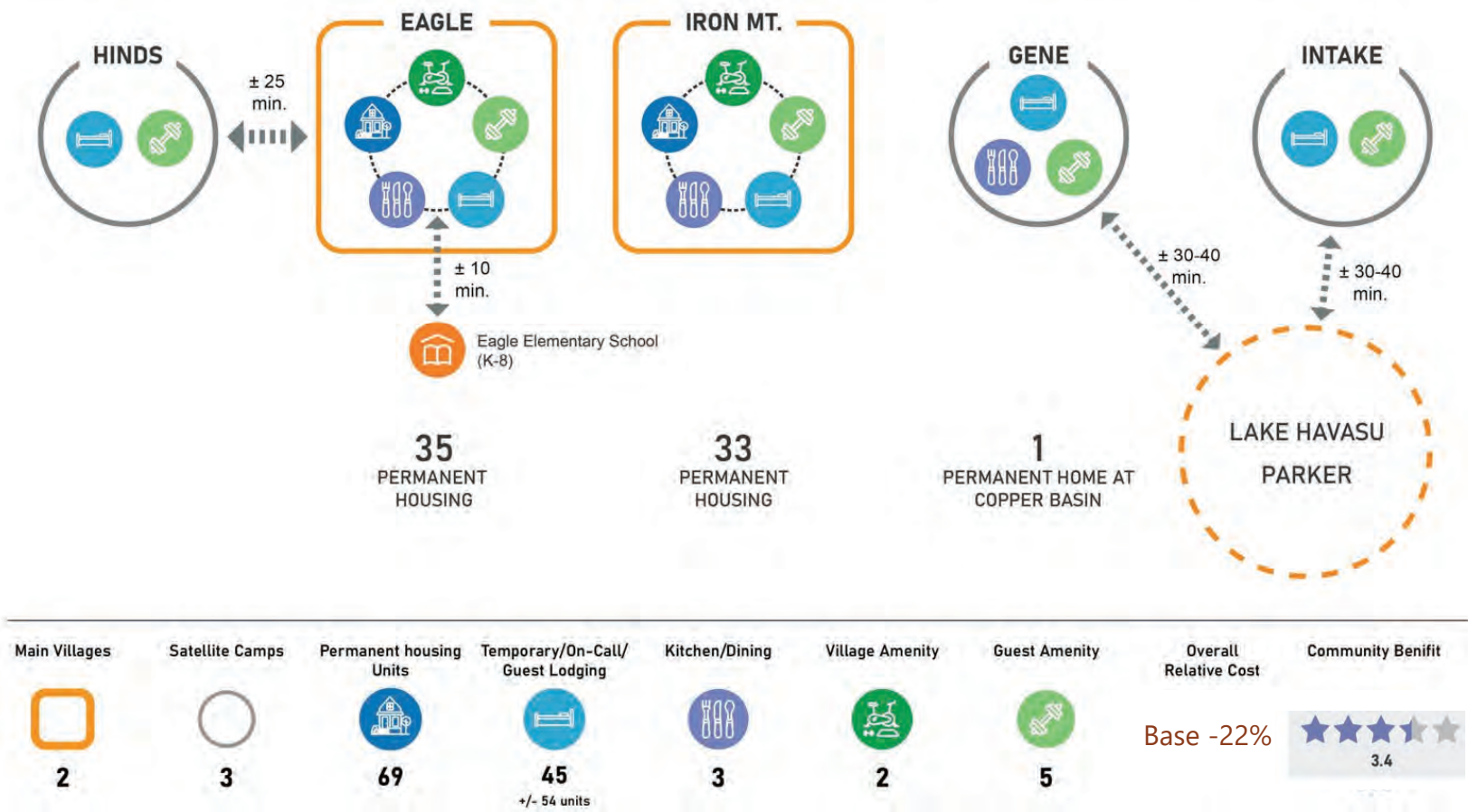
SCENARIO 3: TWO VILLAGES

WEST VILLAGE AT EAGLE MT. AND EAST VILLAGE AT GENE



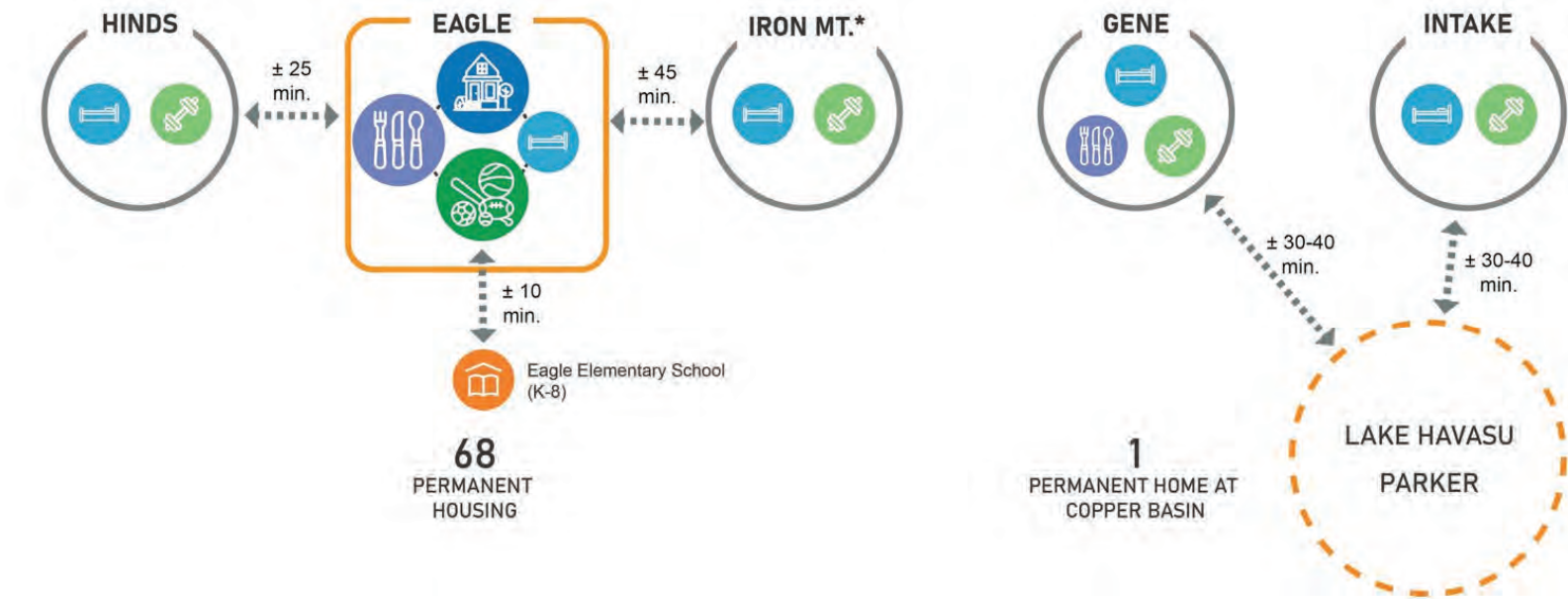
SCENARIO 4: TWO DESERT VILLAGES & DE-COMMISSION GENE VILLAGE

UPGRADE IRON MT. VILLAGE, CONSOLIDATE HINDS AND EAGLE MT., AND ELIMINATE PERMANENT HOUSING AT GENE



SCENARIO 5: ONE WESTERN VILLAGE

WEST DESERT VILLAGE AT EAGLE MT. AND ELIMINATE PERMANENT HOUSING AT ALL OTHER VILLAGES



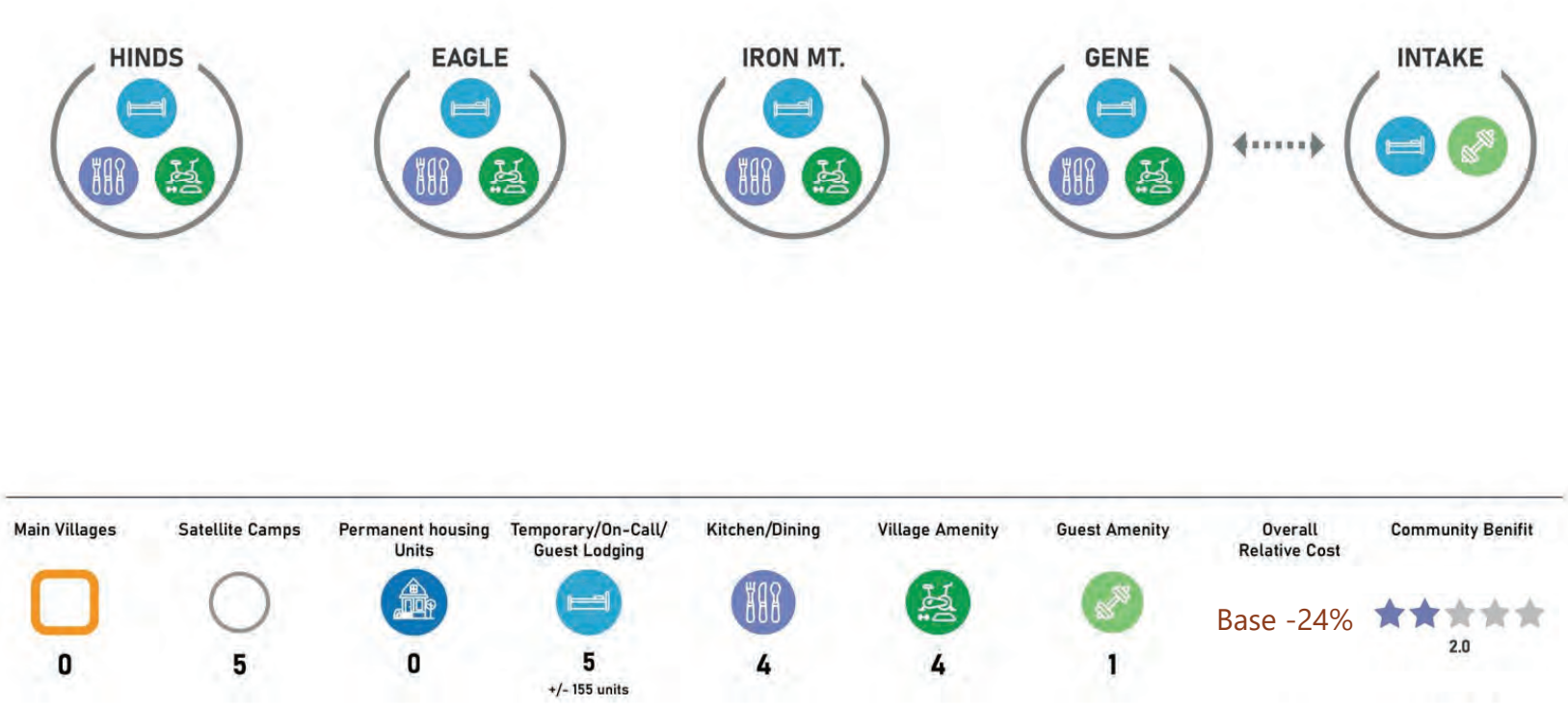
Main Villages	Satellite Camps	Permanent housing Units	Temporary/On-Call/ Guest Lodging	Kitchen/Dining	Upgraded Village Amenity	Guest Amenity	Overall Relative Cost	Community Benefit
 1	 4	 69	 5 +/- 56 units	 2	 1	 4	Base -21%	 3.5































NEW WEST DESERT VILLAGE WITH CONSOLIDATED FOOD SERVICE AND ELIMINATE PERMANENT HOUSING AT GENE



SCENARIO 7: NO VILLAGES

DISCONTINUE PERMANENT HOUSING AT DESERT VILLAGES



	SCENARIO 1 FOUR VILLAGES	SCENARIO 2 THREE VILLAGES	SCENARIO 3 TWO VILLAGES	SCENARIO 4 TWO DESERT VILLAGES & DE-COMMISSION GENE VILLAGE	SCENARIO 5 ONE WESTERN VILLAGE	SCENARIO 6 ONE NEW WESTERN VILLAGE	SCENARIO 7 NO VILLAGES
 Main Village  Satellite Camps	  	  	  	  	  	   	  
 PERMANENT HOUSING	105	105	105	69	69	69	0
 TEMPORARY/ON-CALL /GUEST LODGES	4 Lodges with ± 50 units	5 Lodges with ± 52 units	5 Lodges with ± 54 units	5 Lodges with ± 54 units	5 Lodges with ± 56 units	6 Lodges with ± 58 units	5 Lodges with ± 155 units
 KITCHEN/DINING FACILITIES	3	3	2	3	2	2	4
 VILLAGE AMENITY PACKAGES	4	3	2	2	1	1	4
 GUEST AMENITY PACKAGES	5	5	5	5	4	5	1
 NEW INFRASTRUCTURE PACKAGE	0	1	2	1	2	2	0
OVERALL RELATIVE COST	Base	Base +3%	Base +3%	Base -22%	Base -21%	Base -14%	Base -24%





What is the right level of housing and community amenities that will attract and retain future workforce in remote desert locations?

Does the growth of Lake Havasu and Parker change our perspective of Gene as a remote desert camp?

Which scenarios most align with your vision for the future of Desert Villages?

Which scenarios should be considered for further study?

Civitas and RNT are available for more detailed follow-up conversations. Please contact Soon.

schoi@civitasinc.com



REFINED VILLAGE STRATEGIES

The options on the following slides conceptualize how the five MWD desert communities could be organized over the next 75 years.

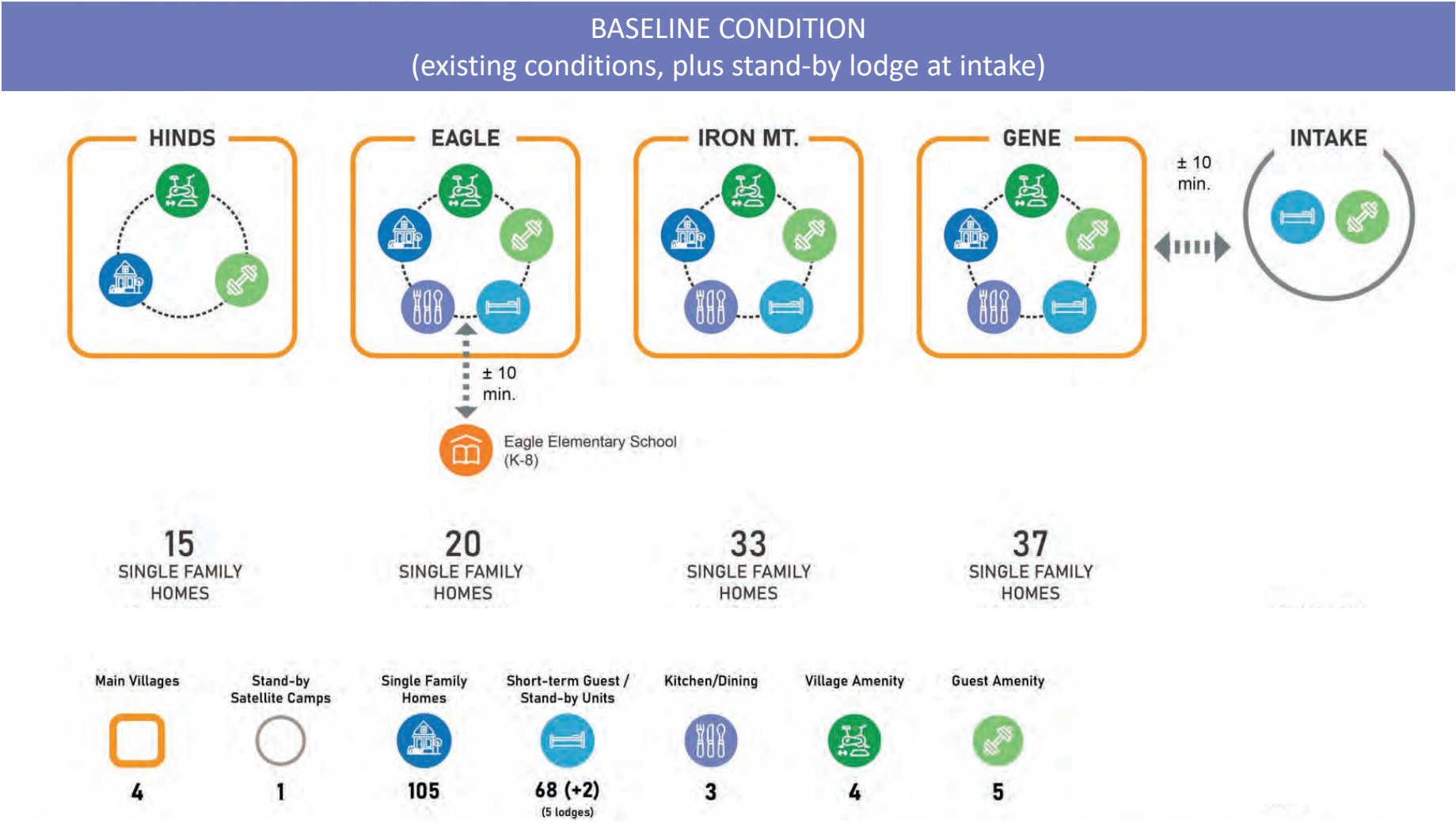
Current employee housing and living situations are not impacted by these scenarios.



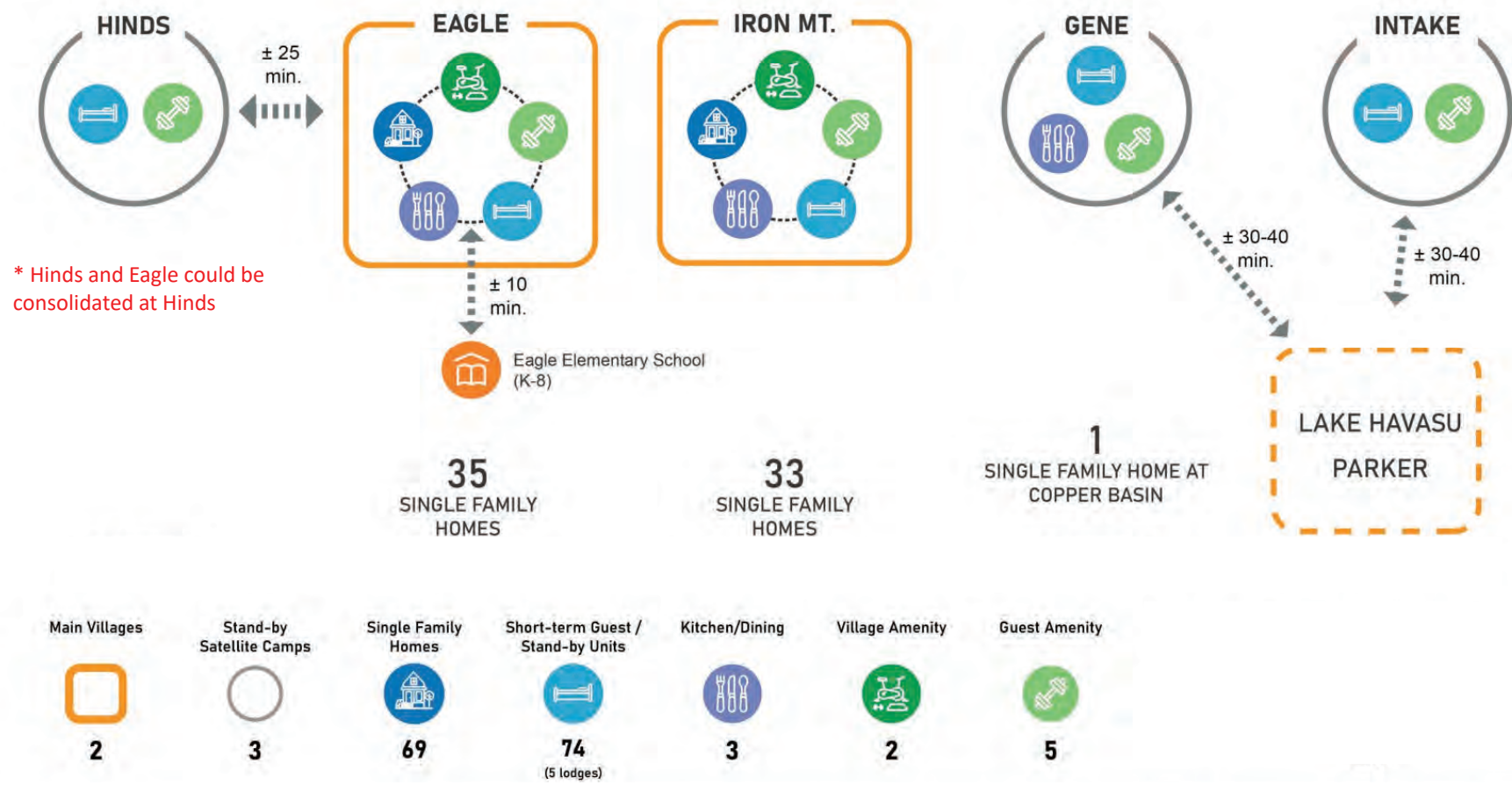
Preferred Village Options

After the MWD Executive Committee meeting in January 2024, 3 village options were selected for further studies. While option 4 is a recommended option from consultant, option 7 is also considered as a goal for the MWD.

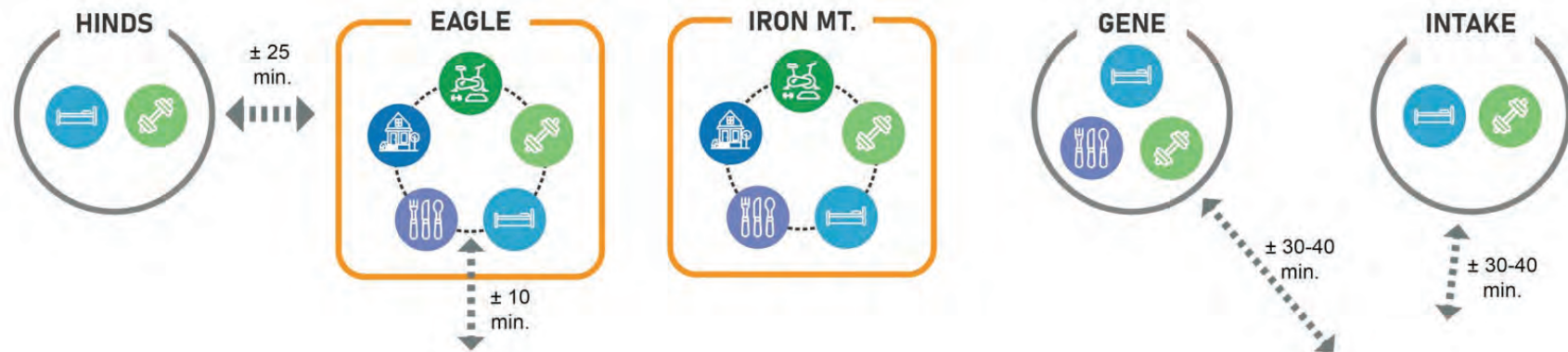




OPTION 4: TWO WEST VILLAGES
@ EAGLE + IRON



OPTION 4: TWO WEST VILLAGES @ EAGLE + IRON

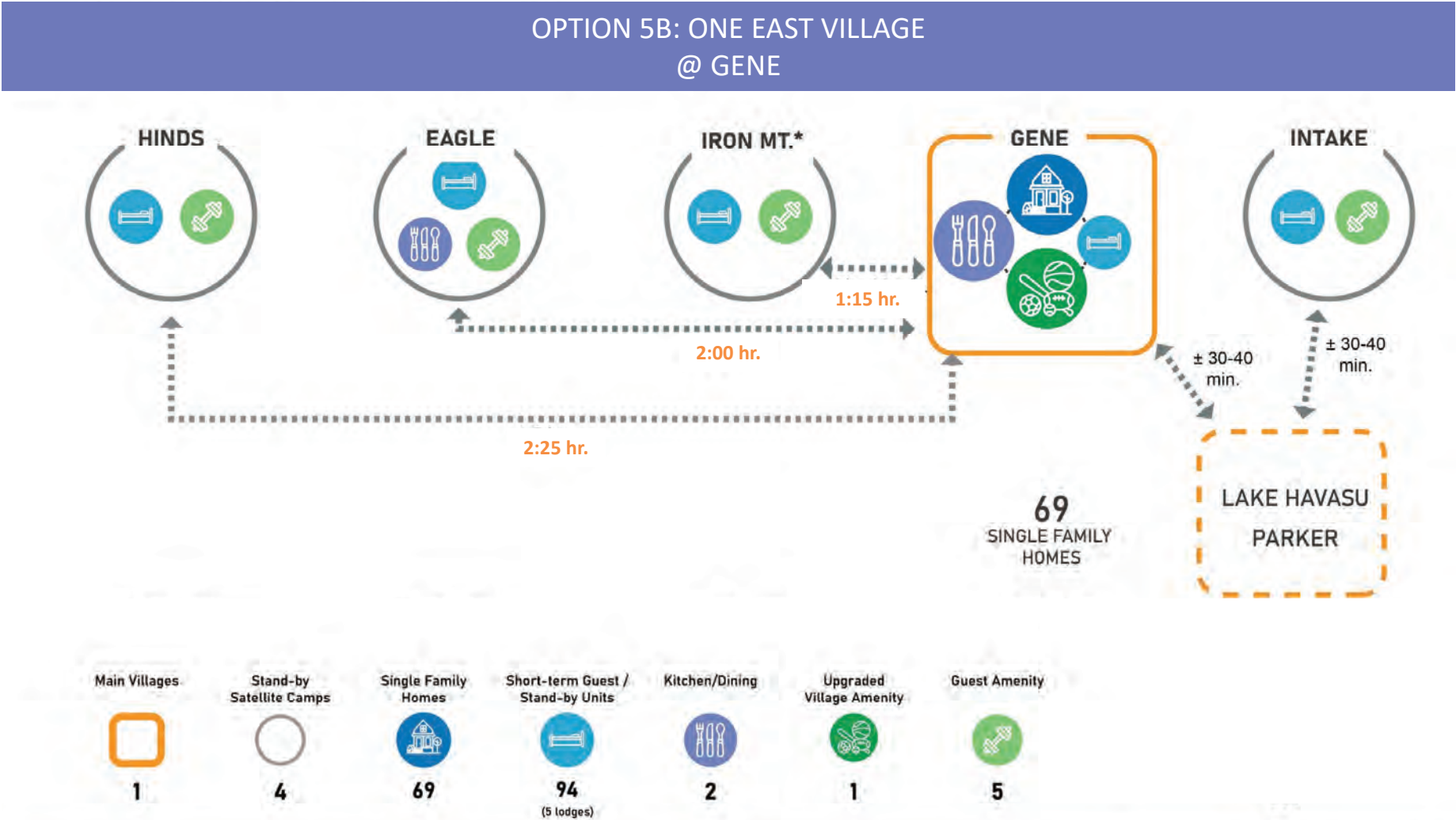


PROS

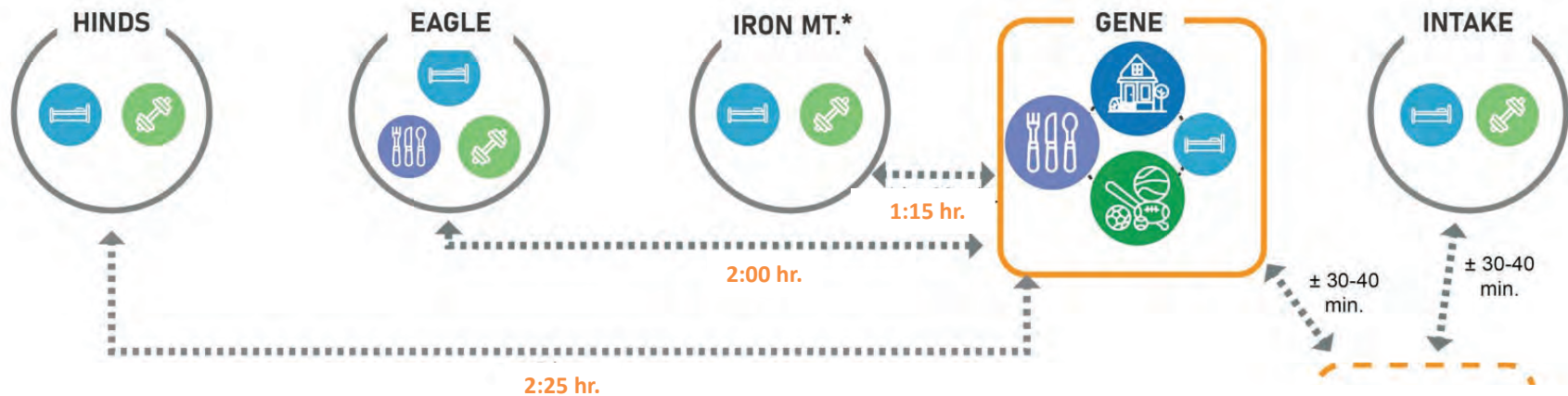
- Focus resources on two expanded amenity packages
- Economy of scale for construction and long-term maintenance
- Larger villages creates greater sense of community and safety
- O&M and Pump Maintenance employees remain at Iron and Eagle

Cons

- Commute to Hinds and Gene pump plants.
- Families are still remote from services (schools, doctors, amenities)
- Acceptance if Gene no longer considered 'remote', employees live in nearby towns.



OPTION 5B: ONE EAST VILLAGE @ GENE



PROS

- Hired at Gene community, dispatched to remote sites for work shift.
- Focus resources on one upgraded amenity packages
- Economy of scale for construction and long-term maintenance
- Larger village creates greater sense of community and safety
- Families are closer to community services in Lake Havasu/Parker (grocery, schools, doctors, amenities)
- Consider modifying shifts to work with this model.
- RV sites could also be offered at camps.

Cons

- Requires long commute times between Gene and remote villages
- Requires duplicative housing units at remote desert villages (permanent house Gene, plus hotel unit at camps)

OPTION 7: FIVE EXTENDED STAY CAMPS



3 homes for rent

3 homes for rent



OPTION 7: FIVE EXTENDED STAY CAMPS



PROS

- Focus time and resources on MWD core mission
 - *MWD no longer operating as property manager of gated communities*
- One multifamily building typology could be replicated across all camps.
- Existing employees will be allowed to “opt-in” to new housing/compensation package
- Extended stay camps have upgraded amenity packages.
- Employee gets “extended stay housing” (*one bedroom condos, RV sites, or casita*)
- Concentrate landscape and placemaking budget in consolidated area
- Requires less property management
- Future generations are generally more accepting of smaller units that require less maintenance and upkeep.

Cons

- Unknown impact recruitment and retention strategy
- Likely will require full kitchen, dining facilities, and hospitality staff at all sites
- Requires strategic transition strategy to align with infrastructure capacity
- Could be less attractive to young employees with families just starting out

	BASELINE	OPTION 4:	OPTION 5B:	OPTION 7:
	FOUR VILLAGES	TWO WEST VILLAGES	ONE EAST VILLAGE	FIVE EXTENDED STAY CAMPS
<div><div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div></div> <div><div>Main Village</div><div>Stand-by Satellite Camps</div><div>Extended Stay Camp</div></div>	<div><div><div>Hinds</div><div>Iron</div><div>Intake</div></div></div>	<div><div>EAGLE MT. AND IRON MT.</div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div>GENE</div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div></div><div></div><div></div><div></div><div></div></div>
<div><div><div></div><div></div></div><div>SINGLE FAMILY HOUSING</div></div>	105	69	69	0
<div><div><div></div><div></div></div><div>STAND-BY/GUEST UNITS</div></div>	± 68 (+2) units	± 74 units	± 94 units	± 68 units
<div><div><div></div><div></div></div><div>EXTENDED STAY UNITS</div></div>	0	0	0	± 105 units
<div><div><div></div><div></div></div><div>KITCHEN/DINING FACILITIES</div></div>	3	3	2	4
<div><div><div></div><div></div></div><div>VILLAGE AMENITY PACKAGES</div></div>	4	2	1	4
<div><div><div></div><div></div></div><div>GUEST AMENITY PACKAGES</div></div>	5	5	4	1



FINAL
VILLAGE STRATEGIES

* 10% housing increase across all villages and scenarios

SUMMARY**TOTAL COST PHASING****THREE DESERT VILLAGES: 100% extended-stay townhomes****YRS 1-5****YRS 6-8****YRS 9-12****YRS 13-15**

105 extended-stay townhomes
12 vacation rentals
64 guest hotels
3 upgraded amenity packages
2 guest amenity packages
3 kitchens

\$145M**\$81.9M****\$24.7M****\$28.2M****\$10.8M****THREE DESERT VILLAGES: 50% Extended-stay townhomes/50% Single family homes**

54 single family homes
53 extended-stay townhomes
9 vacation rentals
64 guest hotels
3 upgraded amenity packages
2 guest amenity packages
3 kitchens

\$189M**\$81.9M****\$39.3M****\$35.2M****\$33M****THREE DESERT VILLAGES: 100% Single family homes**

105 single family homes
24 extended-stay townhomes
64 guest hotels
3 upgraded amenity packages
2 guest amenity packages
3 kitchens
9 vacation rentals








\$249M**\$81.9M****\$58.2M****\$51M****\$58.4M**

THREE DESERT VILLAGES

100% EXTENDED-STAY
TOWNHOMES


















































105 HOUSING UNITS



TOTAL COST		COST PER VILLAGE				
\$ 145.6M		\$2.4M	\$44.6M	\$45.4M	\$45.3M	\$7.9M
SUMMARY OF HOUSING AND AMENITIES						
 Single Family Homes	0	-	-	-	-	-
 Extended Stay Townhomes 750 sq. ft.	105	-	35	33	37	-
 Vacation Rental	12	-	3	3	3	3
 Guest Hotel 350 sq. ft.	64	3	17	25	15	4
 Upgraded Amenities	3	-	1	1	1	-
 Guest Amenity	2	1	-	-	-	1°
 Kitchen	3	-	1	1	1	-



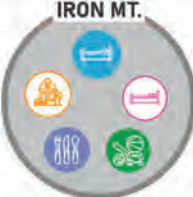


THREE DESERT VILLAGES 100% EXTENDED-STAY TOWNHOMES

105 HOUSING UNITS

	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
HINDS 	 3 guest hotel  1 guest amenity	-	-	-
EAGLE 	 8 townhome  17 guest hotel  2 vacation rental  1 upgraded amenity  1 kitchen	 8 townhome	 13 townhome  1 vacation rental	 6 townhome
IRON MT. 	 8 townhome  25 guest hotel  2 vacation rental  1 upgraded amenity  1 kitchen	 8 townhome	 13 townhome  1 vacation rental	 4 townhome
GENE 	 8 townhome  15 guest hotel  2 vacation rental  1 kitchen	 8 townhome  1 upgraded amenity	 13 townhome  1 vacation rental	 8 townhome
INTAKE 	 4 guest hotel  3 vacation rental  1° guest amenity	-	-	-
TOTAL	 24  64  9  2  2°  3	 24  1	 39  8  3	 18

THREE DESERT VILLAGES 100% EXTENDED-STAY TOWNHOMES

105 HOUSING UNITS

VILLAGE TOTAL	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
 HINDS \$2.4M	\$2.4M 3 GUEST HOTEL 1 GUEST AMENITY	-	-	-
 EAGLE \$44.6M	\$26.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 17 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	\$4.8M 8 EXTENDED STAY TOWNHOMES	\$9.4M 13 EXTENDED STAY TOWNHOMES 1 VACATION RENTAL	\$3.6M 6 EXTENDED STAY TOWNHOMES
 IRON MT. \$45.4M	\$28.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 25 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	\$4.8M 8 EXTENDED STAY TOWNHOMES	\$9.4M 13 EXTENDED STAY TOWNHOMES 1 VACATION RENTAL	\$2.4M 4 EXTENDED STAY TOWNHOMES
 GENE \$45.3M	\$16M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 15 GUEST HOTEL 1 KITCHEN	\$15.1M 8 EXTENDED STAY TOWNHOMES 1 UPGRADED AMENITY	\$9.4M 13 EXTENDED STAY TOWNHOMES 1 VACATION RENTAL	\$4.8M 8 EXTENDED STAY TOWNHOMES
 INTAKE \$7.9M	\$7.9M 4 GUEST HOTEL 1 GUEST AMENITY + CONFERENCE ROOM 3 VACATION RENTALS	-	-	-
TOTAL \$145.6M	\$81.9M	\$24.7M	\$28.2M	\$10.8M

THREE DESERT VILLAGES
50% TOWNHOMES/50% SINGLE
FAMILY HOMES
105 HOUSING UNITS



TOTAL COST		COST PER VILLAGE				
\$ 189.4M		\$2.4M	\$59.2M	\$59.1M	\$60.8M	\$7.9M
SUMMARY OF HOUSING AND AMENITIES						
Single Family Homes	54	-	18	17	19	-
Extended Stay Condo 750 sq. ft.	53	-	17	16	18	-
Vacation Rental	9	-	2	2	2	3
Guest Hotel 350 sq. ft.	64	3	17	25	15	4
Upgraded Amenities	3	-	1	1	1	-
Guest Amenity	2	1	-	-	-	1
Kitchen	3	-	1	1	1	-

THREE DESERT VILLAGES 50% TOWNHOMES/50% SINGLE FAMILY HOMES

105 HOUSING UNITS

	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
HINDS 	3 guest hotel 1 guest amenity	-	-	-
EAGLE 	8 townhome 17 guest hotel 2 vacation rental 6 home 9 townhome 6 home 6 home	6 home 9 townhome	6 home	6 home
IRON MT. 	8 townhome 25 guest hotel 2 vacation rental 5 home 4 townhome 6 home 4 townhome 6 home	5 home 4 townhome	6 home 4 townhome	6 home
GENE 	8 townhome 15 guest hotel 2 vacation rental 8 townhome 1 village amenity 9 home 2 townhome 10 home	8 townhome 1 village amenity	9 home 2 townhome	10 home
INTAKE 	4 guest hotel 3 vacation rental 1° guest amenity	-	-	-
TOTAL	24 townhome 64 guest hotel 9 vacation rental 2 home 2° village amenity 3 home	11 home 21 townhome 1 village amenity	21 home 6 townhome	22 home








THREE DESERT VILLAGES 50% TOWNHOMES/50% SINGLE FAMILY HOMES

105 HOUSING UNITS

VILLAGE TOTAL	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
 HINDS \$2.4M	\$2.4M 3 GUEST HOTEL 1 GUEST AMENITY	-	-	-
 EAGLE \$59.2M	\$26.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 17 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	\$14.4M 6 SINGLE FAMILY HOMES 9 EXTENDED STAY TOWNHOMES	\$9M 6 SINGLE FAMILY HOMES	\$9M 6 SINGLE FAMILY HOMES
 IRON MT. \$59M	\$28.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 25 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	\$9.8M 5 SINGLE FAMILY HOMES 4 EXTENDED STAY TOWNHOMES	\$11.4M 6 SINGLE FAMILY HOMES 4 EXTENDED STAY TOWNHOMES	\$9M 6 SINGLE FAMILY HOMES
 GENE \$60.8M	\$16M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 15 GUEST HOTEL 1 KITCHEN	\$15.1M 8 EXTENDED STAY CONDOS 1 UPGRADED AMENITY	\$14.7M 9 SINGLE FAMILY HOMES 2 EXTENDED STAY TOWNHOMES	\$15M 10 SINGLE FAMILY HOMES
 INTAKE \$7.9M	\$7.9M 4 GUEST HOTEL 1 GUEST AMENITY + CONFERENCE ROOM 3 VACATION RENTALS	-	-	-
TOTAL \$189.4M	\$81.9M	\$39.3M	\$35.2M	\$33M

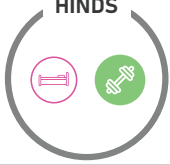











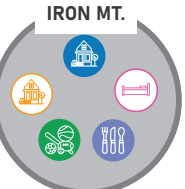








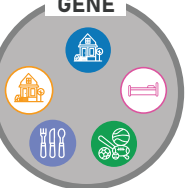























THREE DESERT VILLAGES
100% SINGLE FAMILY HOMES
105 HOUSING UNITS



TOTAL COST		COST PER VILLAGE				
\$249.5M		\$2.4M	\$79.2M	\$78.3M	\$81.7M	\$7.9M
SUMMARY OF HOUSING AND AMENITIES						
 105 Single Family Homes	105	-	35	33	37	-
 24 Extended Stay Condo 750 sq. ft.	24	-	8	8	8	-
 9 Vacation Rental	9	-	2	2	2	3
 64 Guest Hotel 350 sq. ft.	64	3	17	25	15	4
 3 Upgraded Amenities	3	-	1	1	1	-
 2 Guest Amenity	2	1	-	-	-	1
 3 Kitchen	3	-	1	1	1	-

THREE DESERT VILLAGES 100% SINGLE FAMILY HOMES

105 HOUSING UNITS

	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
HINDS 	 3 guest hotel  1 guest amenity	-	-	-
EAGLE 	 8 townhome  17 guest hotel  2 vacation rental  1 upgraded amenity  1 kitchen	 10 home	 10 home	 15 home
IRON MT. 	 8 townhome  25 guest hotel  2 vacation rental  1 upgraded amenity  1 kitchen	 10 home	 12 home	 11 home
GENE 	 8 townhome  15 guest hotel  2 vacation rental  1 upgraded amenity  1 kitchen	 12 home  1 upgraded amenity	 12 home	 13 home
INTAKE 	 4 guest hotel  3 vacation rental  1° guest amenity	-	-	-
TOTAL	 24 townhome  64 guest hotel  9 vacation rental  2 upgraded amenity  2° guest amenity  3 kitchen	 32 home  1 upgraded amenity	 34 home	 39 home

THREE DESERT VILLAGES 100% SINGLE FAMILY HOMES

105 HOUSING UNITS

VILLAGE TOTAL	PHASE 1 YRS 1-5	PHASE 2 YRS 6-8	PHASE 3 YRS 9-12	PHASE 4 YRS 13-15
HINDS  \$2.4M	\$2.4M 3 GUEST HOTEL 1 GUEST AMENITY	-	-	-
EAGLE  \$79.2M	\$26.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 17 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	10 SINGLE FAMILY HOMES	10 SINGLE FAMILY HOMES	15 SINGLE FAMILY HOMES
IRON MT.  \$78.3M	\$28.8M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 25 GUEST HOTEL 1 UPGRADED AMENITY 1 KITCHEN	10 SINGLE FAMILY HOMES	12 SINGLE FAMILY HOMES	11 SINGLE FAMILY HOMES
GENE  \$81.7M	\$16M 8 EXTENDED STAY TOWNHOMES 2 VACATION RENTALS 15 GUEST HOTEL 1 KITCHEN	12 SINGLE FAMILY HOMES 1 UPGRADED AMENITY	12 SINGLE FAMILY HOMES	13 SINGLE FAMILY HOMES
INTAKE  \$7.9M	\$7.9M 4 GUEST HOTEL 1 GUEST AMENITY + CONFERENCE ROOM 3 VACATION RENTALS	-	-	-
TOTAL \$249.5M	\$81.9M	\$58.2M	\$51M	\$58.4M

DETAILED PHASING STRATEGY FOR EACH VILLAGE

- CONCEPTUAL PHASING STRATEGY - IRON MOUNTAIN 112
- DETAILED VILLAGE PHASING STRATEGY 119



CONCEPTUAL PHASING STRATEGY IRON MOUNTAIN

CONTEXT:

- **Conceptual Phasing Strategy** - Iron Mountain Village
- **Future housing needs: 33 units** (based upon projected staffing = current needs plus 10%)
- **Future hotel needs: 25 units** (replace existing 17 guest hotel units plus an additional 8 units)
- Vacation rental home could be either new housing or existing homes to reuse.

LEGEND:

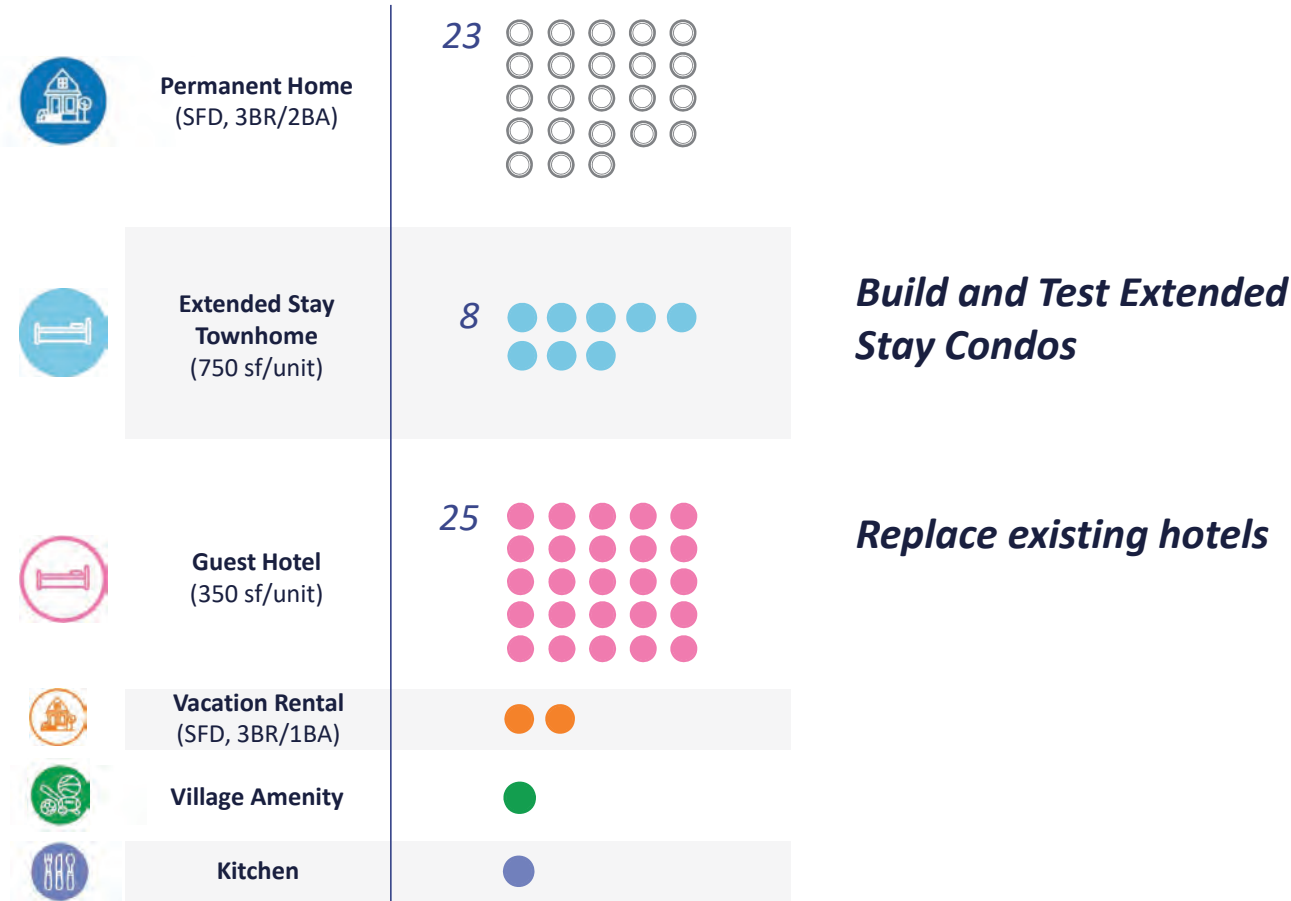
-  CURRENT HOMES
-  NEW CONSTRUCTION
-  PREVIOUSLY CONSTRUCTED

** The circle colors correspond to program elements on following slides.*

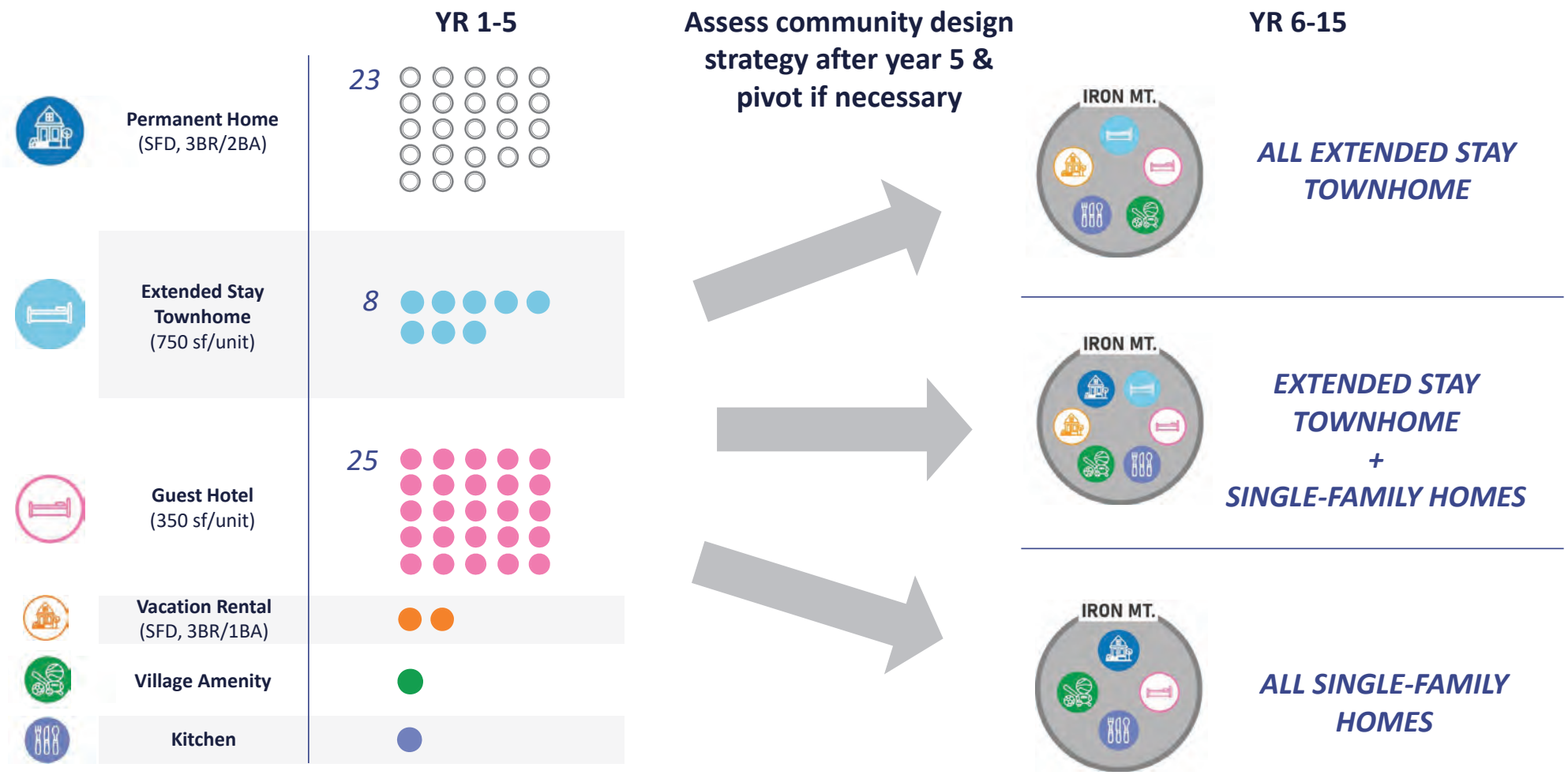
CONCEPTUAL PHASING STRATEGY FOR IRON MOUNTAIN

(As case study, similar logic can be applied to Eagle and Gene camps.)

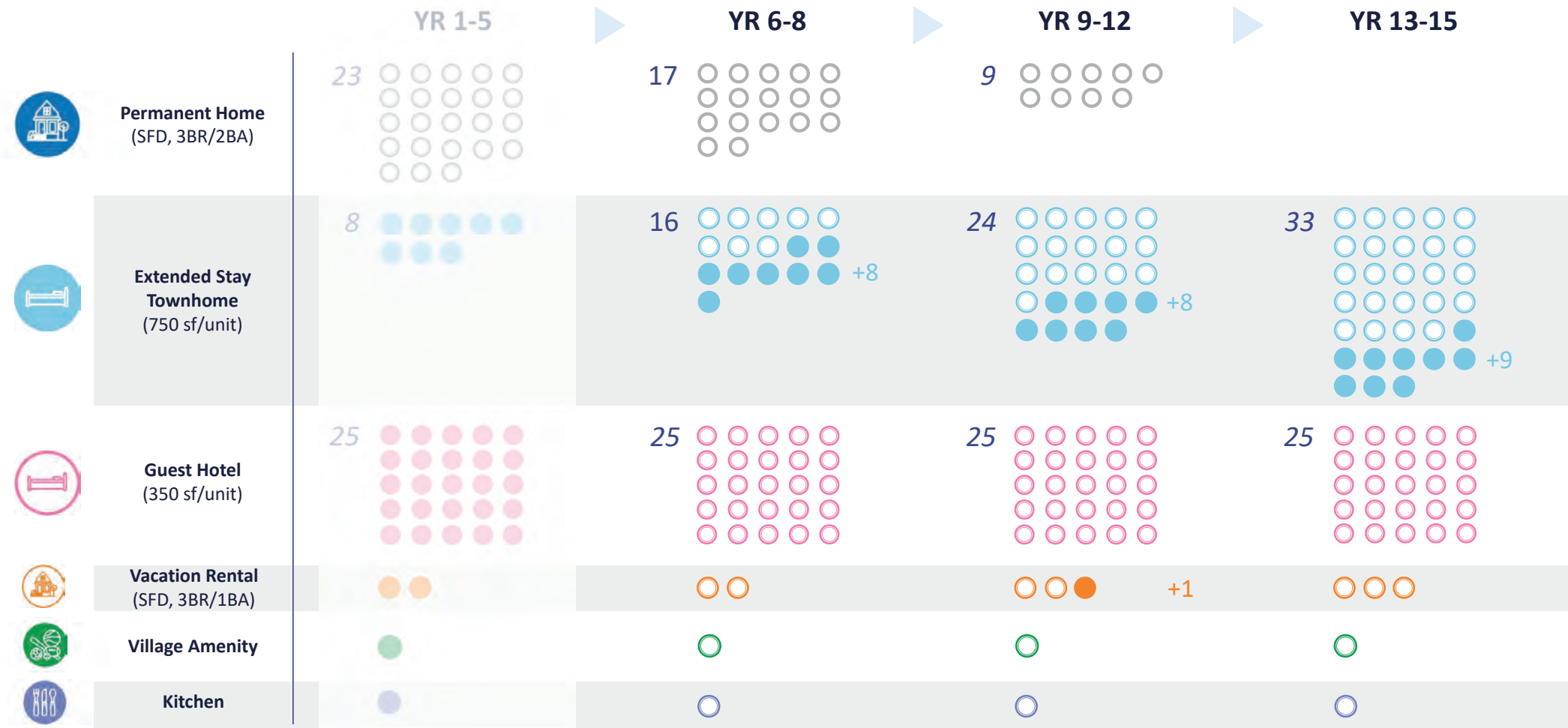
YR 1-5



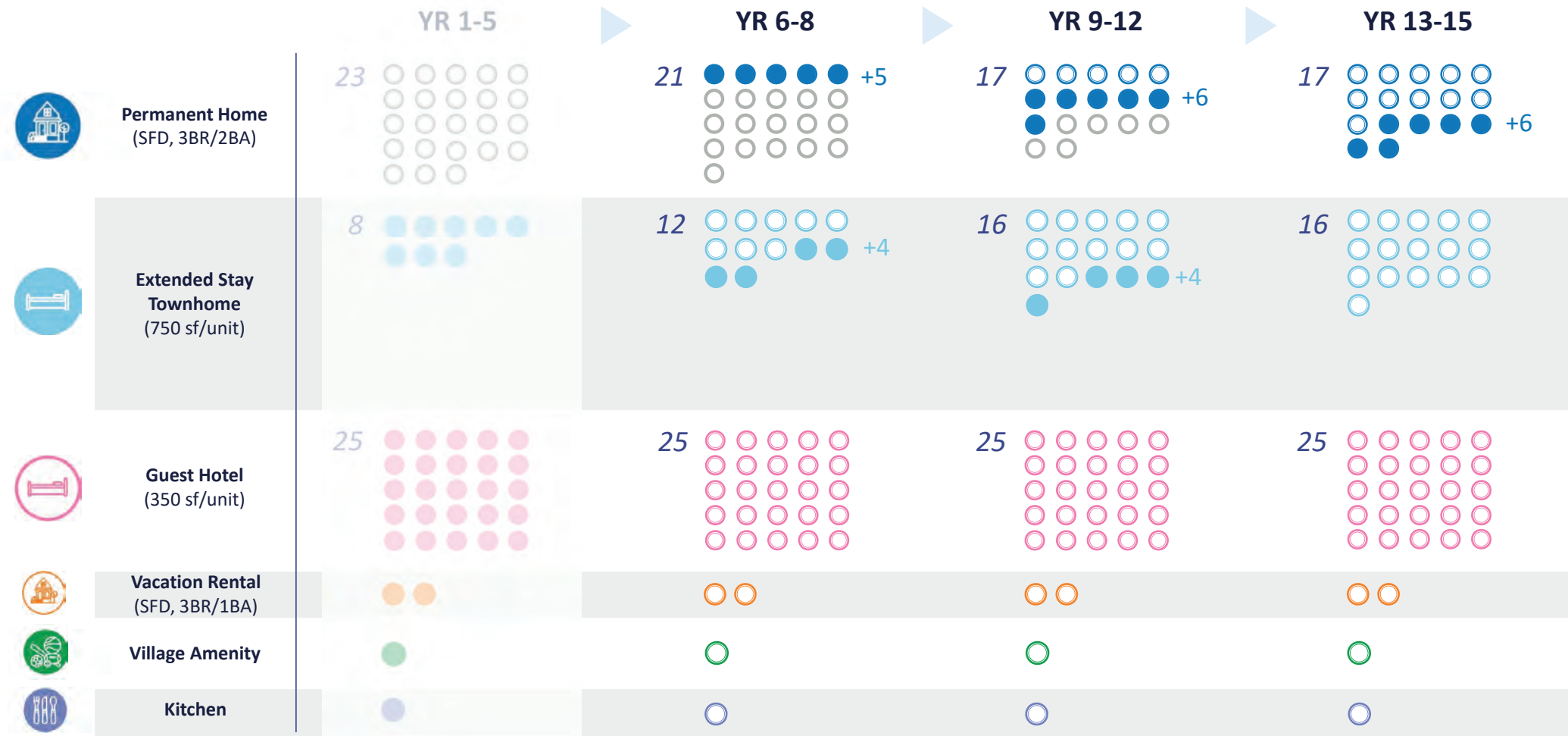
CASE STUDY FOR IRON MOUNTAIN



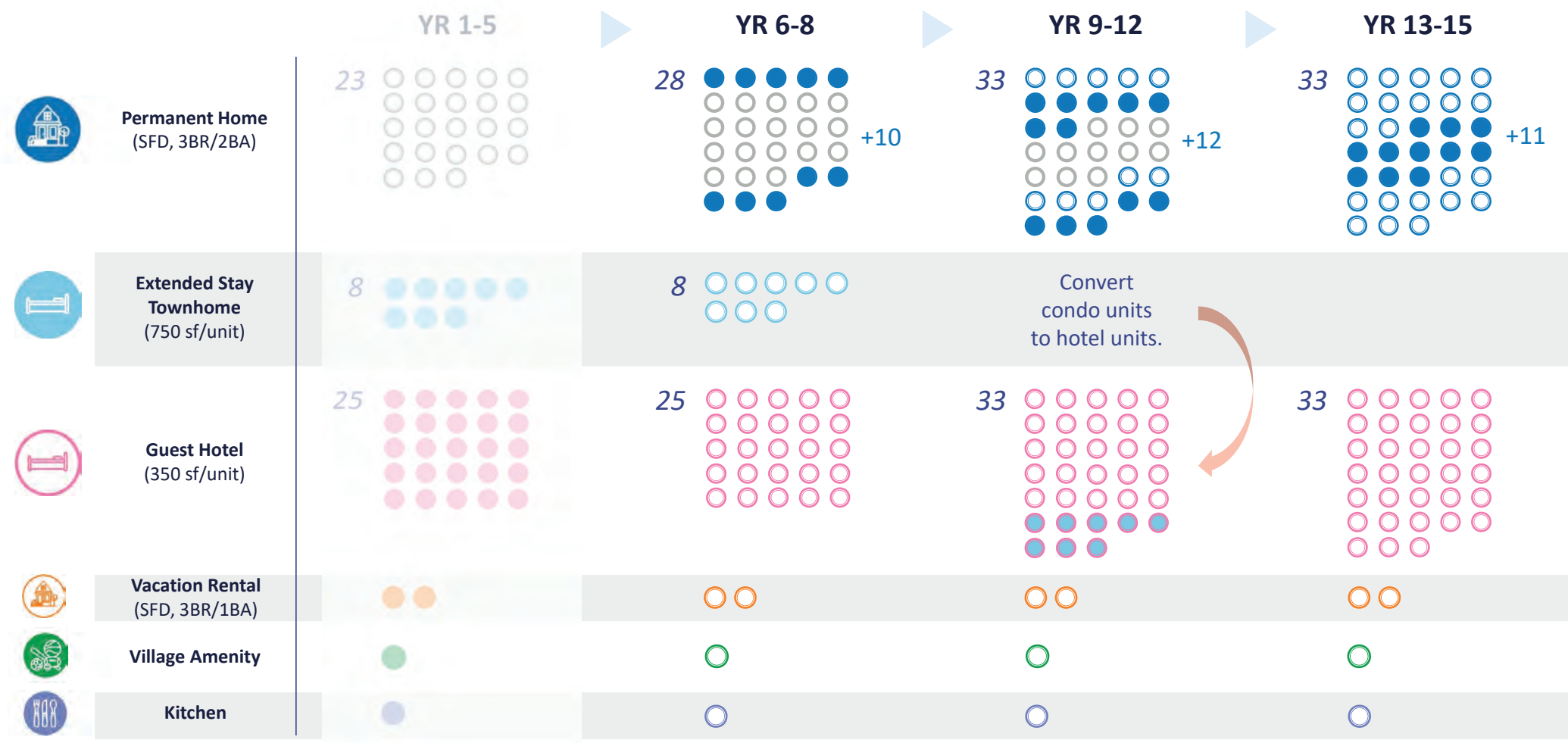
CASE STUDY FOR IRON MOUNTAIN: 100% EXTENDED STAY TOWNHOME



CASE STUDY FOR IRON MOUNTAIN: MIX EXTENDED STAY TOWNHOME (50%) + SINGLE FAMILY HOMES (50%)



CASE STUDY FOR IRON MOUNTAIN: 100% SINGLE FAMILY HOMES






Appendix: DETAILED VILLAGE PHASING STRAEGIES

THREE DESERT VILLAGES


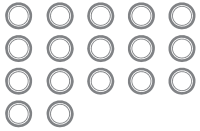




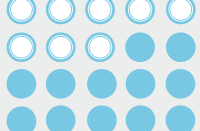
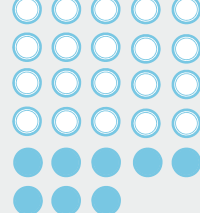
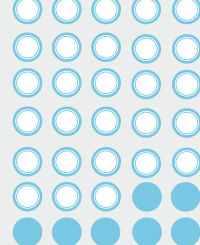



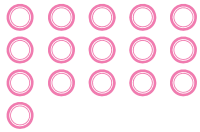
















THREE DESERT VILLAGES

100% EXTENDED-STAY
TOWNHOMES
105 HOUSING UNITS


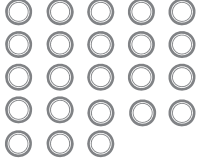




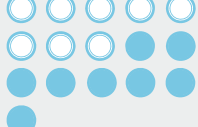
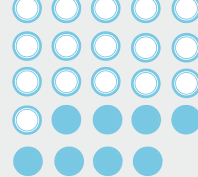
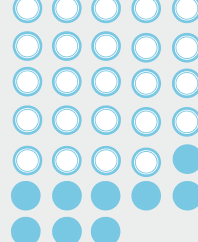

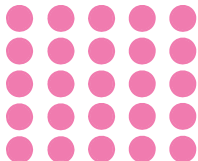
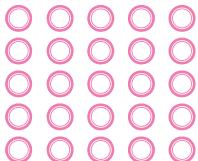
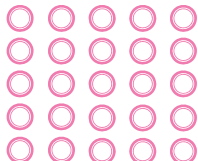
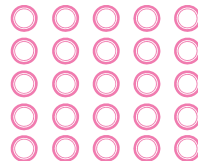

















TOTAL COST		COST PER VILLAGE				
\$ 145.6M		\$2.4M	\$44.6M	\$45.4M	\$45.3M	\$7.9M
SUMMARY OF HOUSING AND AMENITIES						
	0	-	-	-	-	-
Single Family Homes						
	105	-	35	33	37	-
Extended Stay Townhomes 750 sq. ft.						
	12	-	3	3	3	3
Vacation Rental						
	64	3	17	25	15	4
Guest Hotel 350 sq. ft.						
	3	-	1	1	1	-
Upgraded Amenities						
	2	1	-	-	-	1°
Guest Amenity						
	3	-	1	1	1	-
Kitchen						

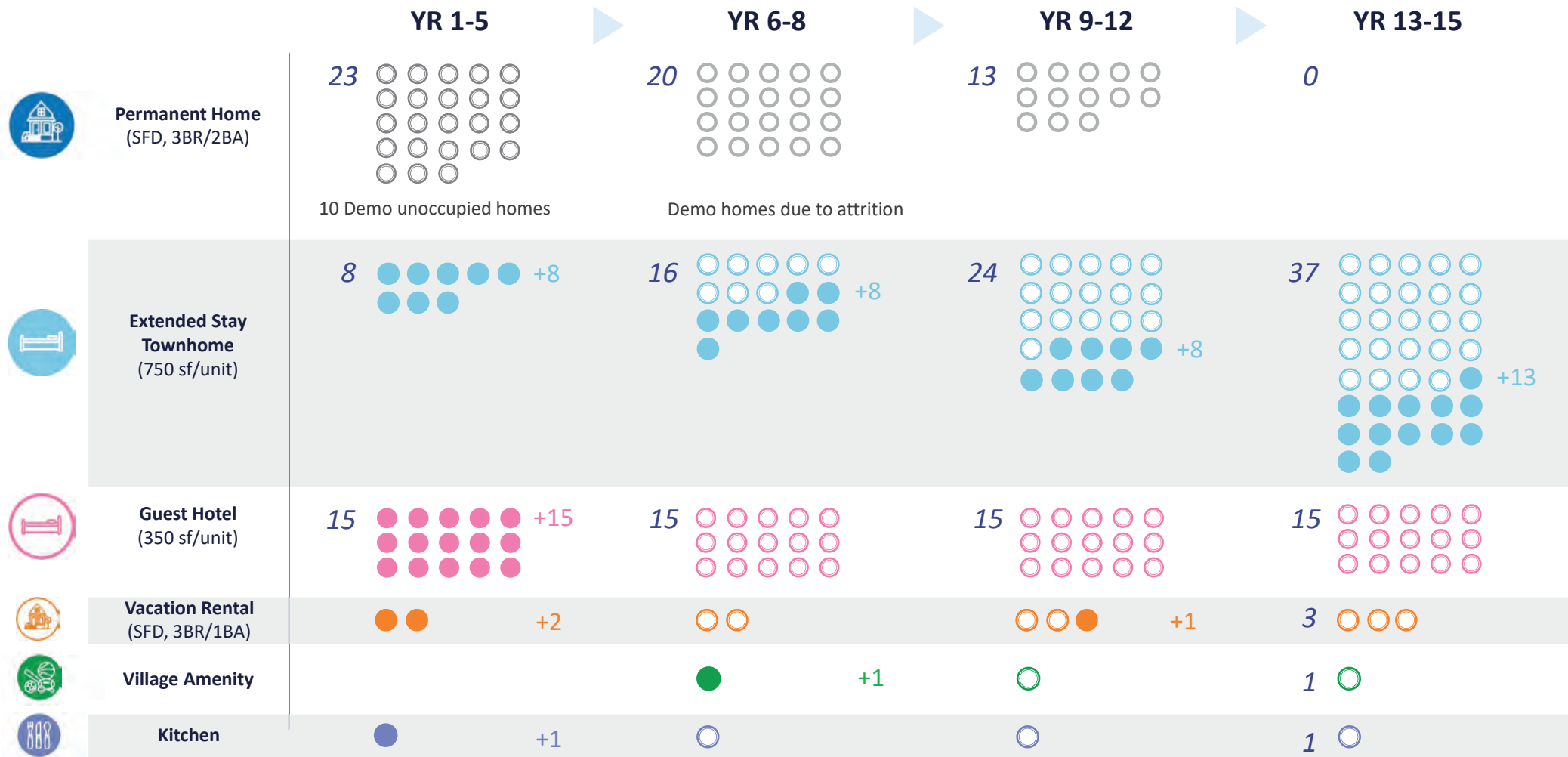
EAGLE MOUNTAIN VILLAGE (+HINDS): 100% EXTENDED STAY TOWNHOMES

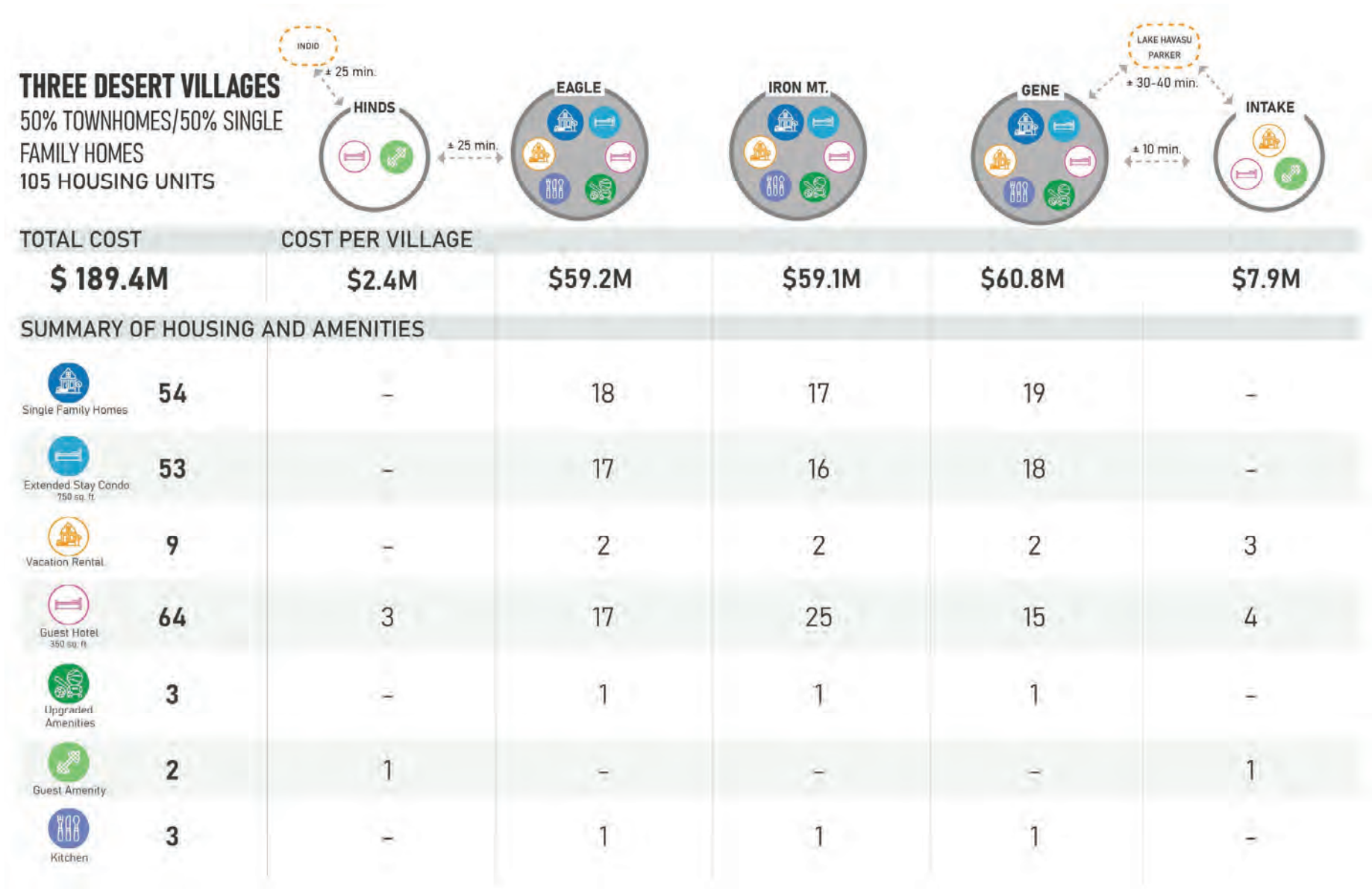
	YR 1-5	YR 6-8	YR 9-12	YR 13-15
 Permanent Home (SFD, 3BR/2BA)	17 	15 	7 	0
 Extended Stay Townhome (750 sf/unit)	8  +8	20  +12 HINDS MERGE WITH EAGLE	28  +8	35  +7
 Guest Hotel (350 sf/unit)	16  +16	16 	16 	16 
 Vacation Rental (SFD, 3BR/1BA)	2  +2	2 	3  +1	3 
 Village Amenity	1  +1	1 	1 	1 
 Kitchen	1  +1	1 	1 	1 

IRON MOUNTAIN EXTENDED STAY CAMP: 100% EXTENDED STAY TOWNHOMES


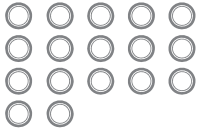


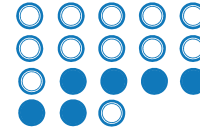


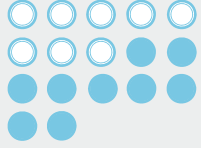



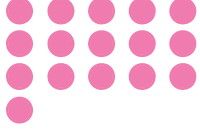
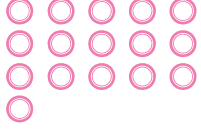
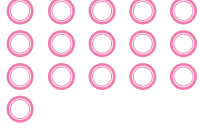
















	YR 1-5	YR 6-8	YR 9-12	YR 13-15
 Permanent Home (SFD, 3BR/2BA)	23 	17 	9 	0
 Extended Stay Townhome (750 sf/unit)	8  +8	16  +8	24  +8	33  +9
 Guest Hotel (350 sf/unit)	25  +25	25 	25 	25 
 Vacation Rental (SFD, 3BR/1BA)	2  +2	2 	3  +1	3 
 Village Amenity	1  +1	1 	1 	1 
 Kitchen	1  +1	1 	1 	1 

GENE EXTENDED STAY CAMP: 100% EXTENDED STAY TOWNHOMES


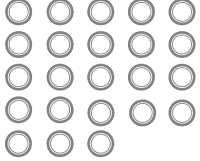
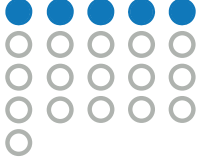

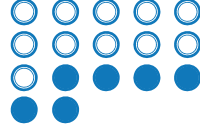



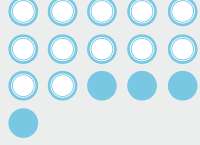
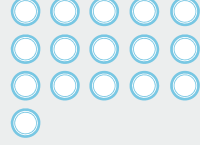

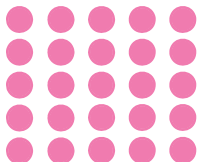
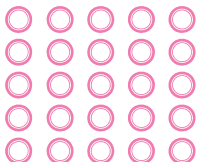
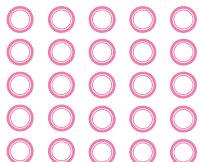
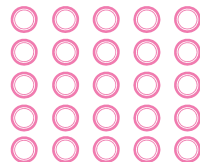




















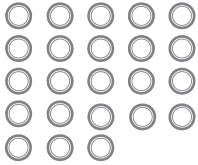


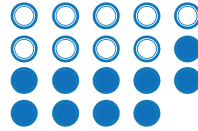


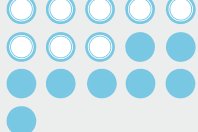
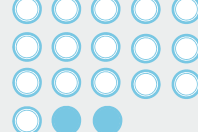
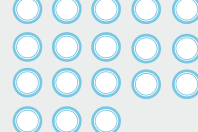



















EAGLE MOUNTAIN VILLAGE (+HINDS): EXTENDED STAY TOWNHOME (50%) + SINGLE FAMILY HOMES (50%)

	YR 1-5	YR 6-8	YR 9-12	YR 13-15
 Permanent Home (SFD, 3BR/2BA)	17 	18  +6	18  +6	18  +6
 Extended Stay Townhome (750 sf/unit)	8  +8	17  +9 HINDS MERGE WITH EAGLE	17 	17 
 Guest Hotel (350 sf/unit)	16  +16	16 	16 	16 
 Vacation Rental (SFD, 3BR/1BA)	2  +2	2 	2 	2 
 Village Amenity	1  +1	1 	1 	1 
 Kitchen	1  +1	1 	1 	1 

IRON MOUNTAIN VILLAGE: EXTENDED STAY CONDO (50%) + SINGLE FAMILY HOMES (50%)

	YR 1-5	YR 6-8	YR 9-12	YR 13-15
 Permanent Home (SFD, 3BR/2BA)	23 	21  +5	17  +6	17  +6
 Extended Stay Townhome (750 sf/unit)	8  +8	12  +4	16  +4	16 
 Guest Hotel (350 sf/unit)	25  +25	25 	25 	25 
 Vacation Rental (SFD, 3BR/1BA)	2  +2	2 	2 	2 
 Village Amenity	1  +1	1 	1 	1 
 Kitchen	1  +1	1 	1 	1 


GENE EXTENDED STAY CAMP: EXTENDED STAY CONDO (50%) + SINGLE FAMILY HOMES (50%)

	YR 1-5	YR 6-8	YR 9-12	YR 13-15
 Permanent Home (SFD, 3BR/2BA)	23  10 Demo unoccupied homes	19 	19  +9	19  +10
 Extended Stay Townhome (750 sf/unit)	8  +8	16  +8	18  +2	18 
 Guest Hotel (350 sf/unit)	15  +15	15 	15 	15 
 Vacation Rental (SFD, 3BR/1BA)	2  +2	2 	2 	2 
 Village Amenity		1  +1	1 	1 
 Kitchen	1  +1	1 	1 	1 

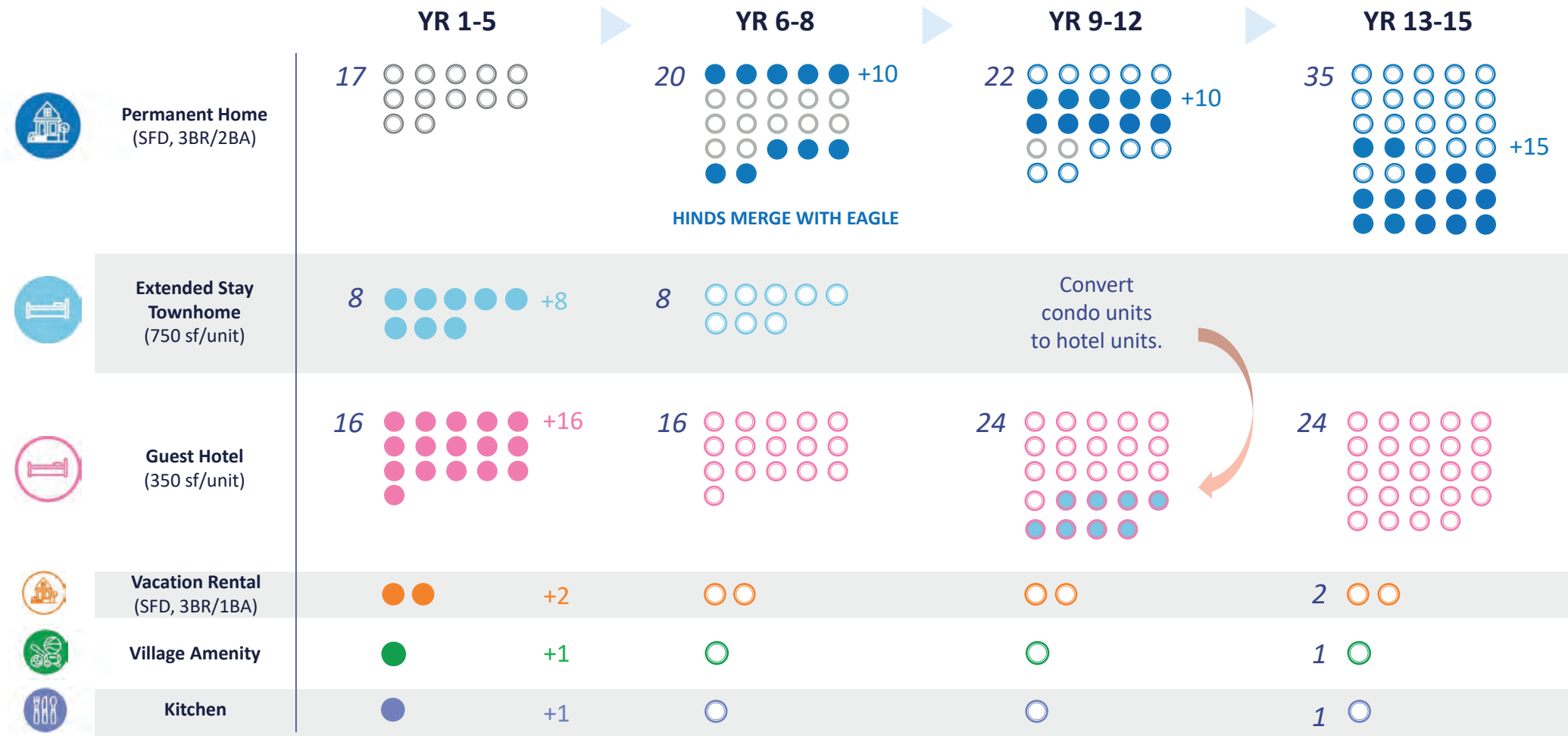
THREE DESERT VILLAGES

100% SINGLE FAMILY HOMES
105 HOUSING UNITS

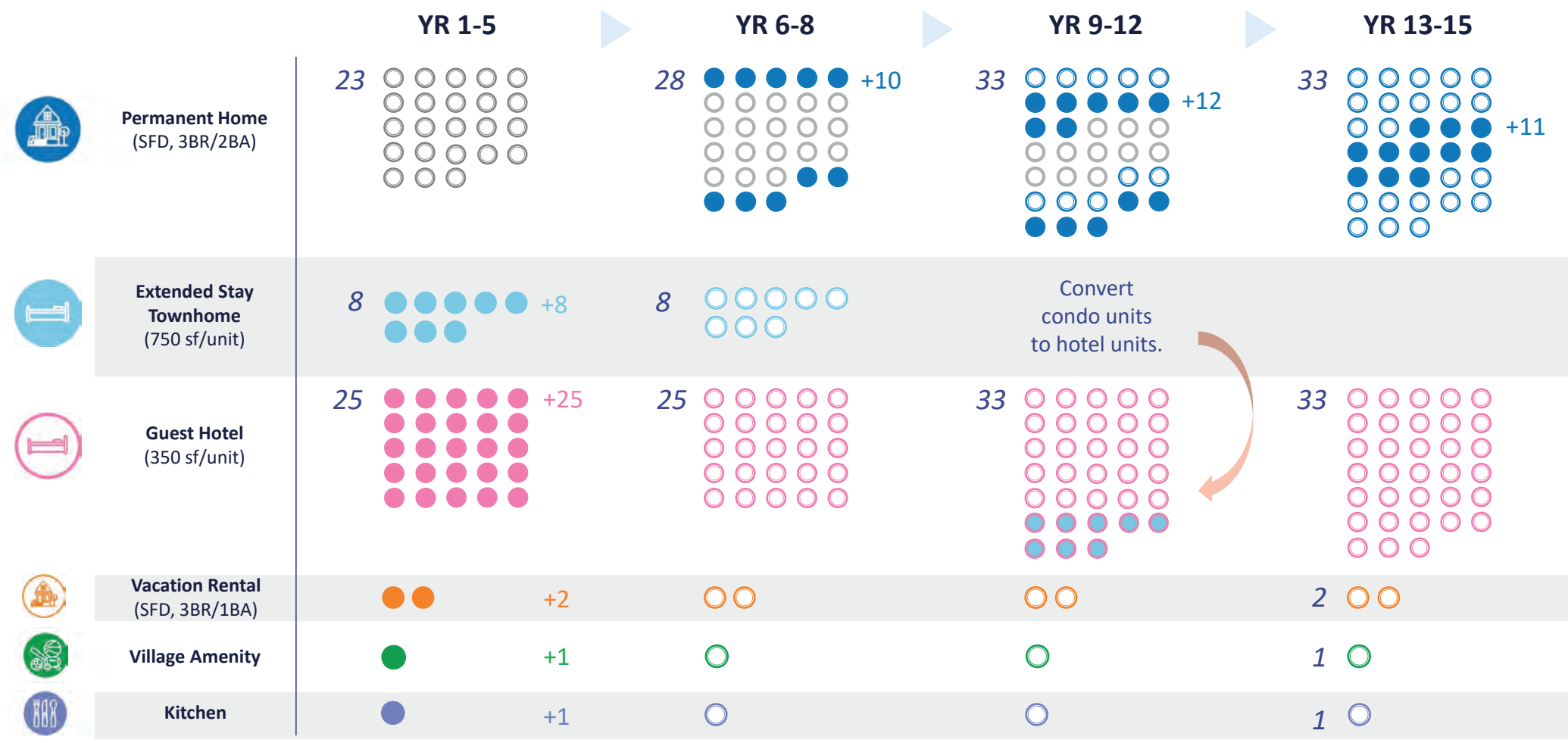


TOTAL COST		COST PER VILLAGE				
\$249.5M		\$2.4M	\$79.2M	\$78.3M	\$81.7M	\$7.9M
SUMMARY OF HOUSING AND AMENITIES						
	105	-	35	33	37	-
Single Family Homes						
	24	-	8	8	8	-
Extended Stay Condo 750 sq. ft.						
	9	-	2	2	2	3
Vacation Rental						
	64	3	17	25	15	4
Guest Hotel 350 sq. ft.						
	3	-	1	1	1	-
Upgraded Amenities						
	2	1	-	-	-	1
Guest Amenity						
	3	-	1	1	1	-
Kitchen						

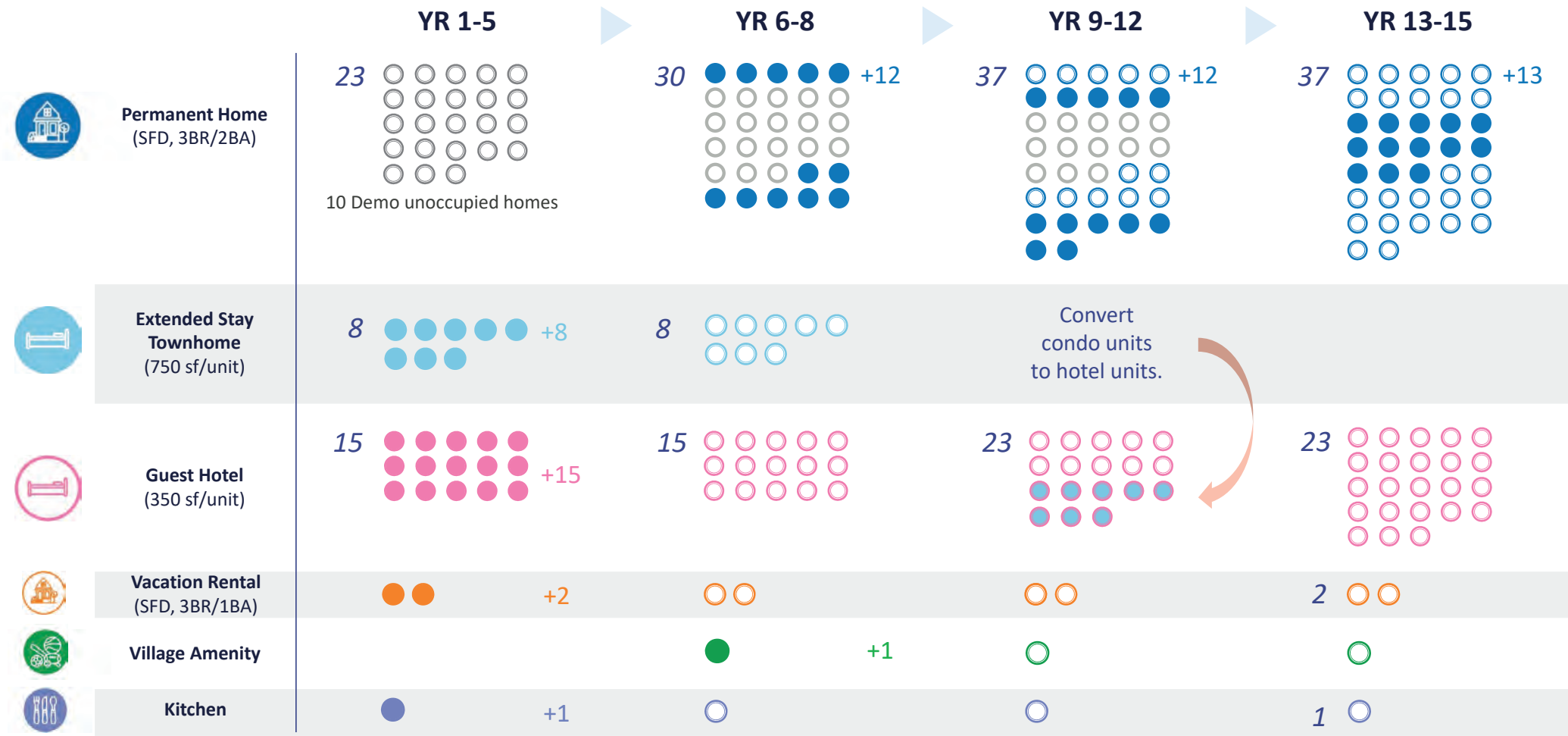
EAGLE MOUNTAIN VILLAGE (+HINDS): 100% SINGLE FAMILY HOMES



IRON MOUNTAIN VILLAGE: 100% SINGLE FAMILY HOMES



GENE EXTENDED STAY CAMP: 100% SINGLE FAMILY HOMES

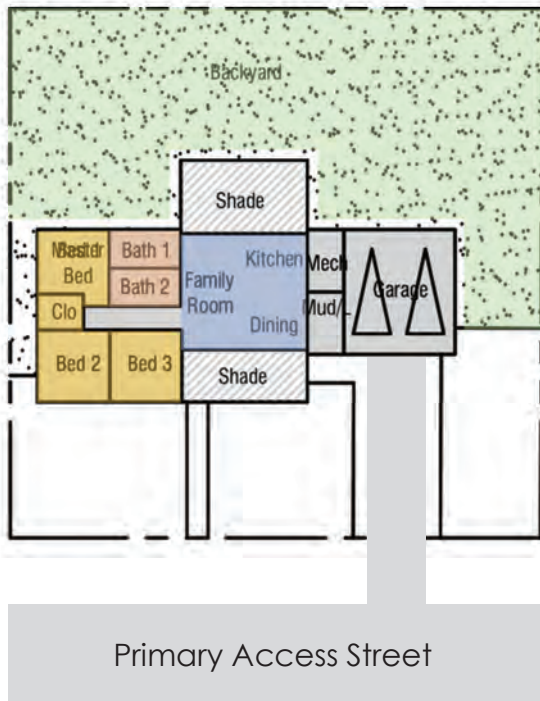


AMENITIES AND COSTS



PERMANENT HOMES

SINGLE-FAMILY DETACHED HOME

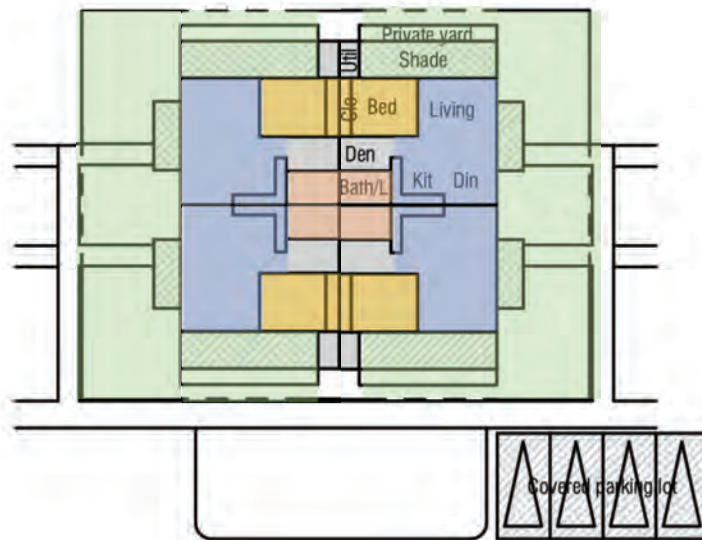


- **± \$ 1.5 M** per unit.
 - **3 bd / 2 ba.**
 - Attached 2 car garage.
 - Covered patio.
-
- 2022 estimate based upon architectural drawings (1M)
 - 2024 cost estimate (1.5M) based upon square footage costs of comparable construction types, landscape and utility runs to the house from the street



EXTENDED STAY TOWNHOME

PINWHEEL TYPE

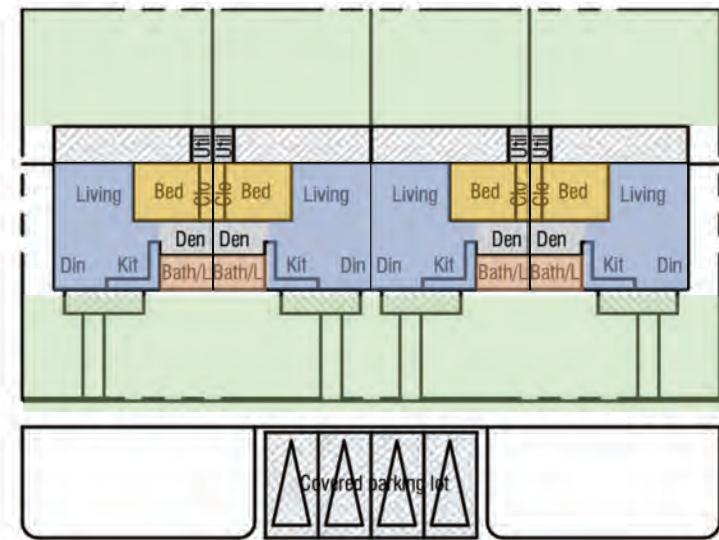


Primary Access Street

± **\$538,000** per unit.

- **1 bd / 1 ba.**
- Detached 1 car carport.

LINEAR TYPE

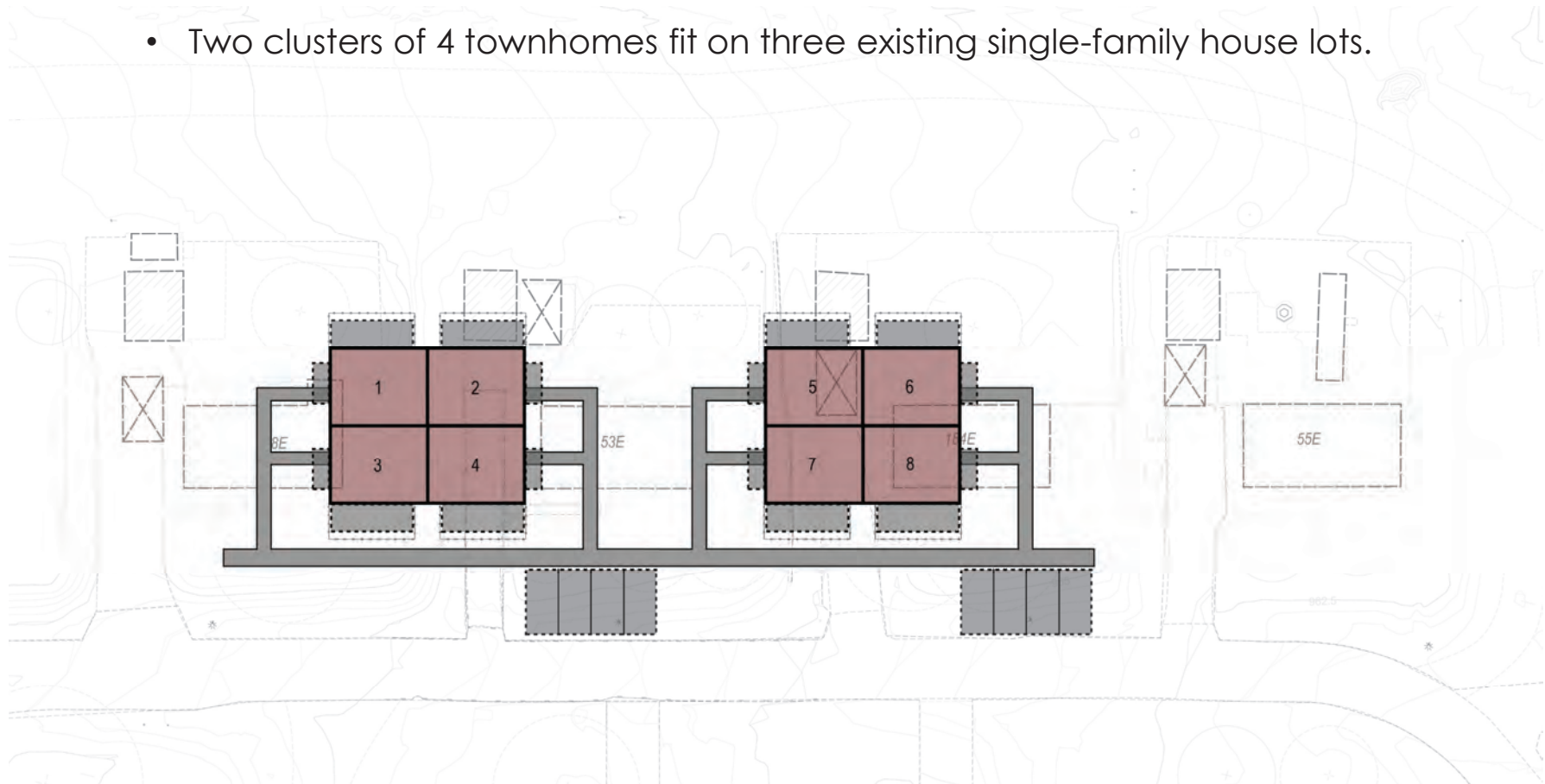


Primary Access Street

- ± **\$ 600,000** per unit.
- **1 bd / 1 ba.**
- Detached 1 car carport.

TOWNHOME TEST FIT IN EXISTING LOT

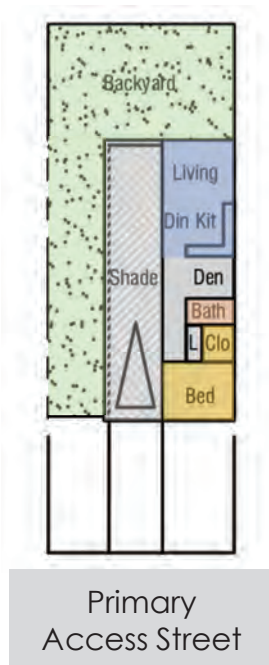
- Two clusters of 4 townhomes fit on three existing single-family house lots.





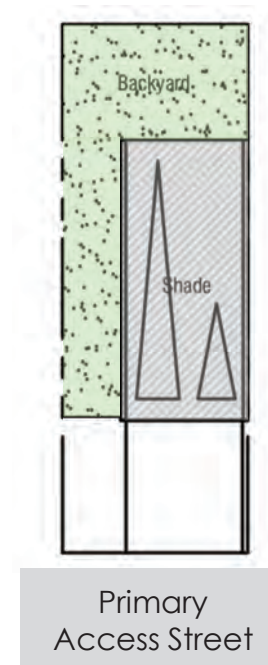
EXTENDED STAY CONDO

CASITA



- **± \$ 633,000** per unit.
- **1 bd / 1 ba.**
- Attached carport

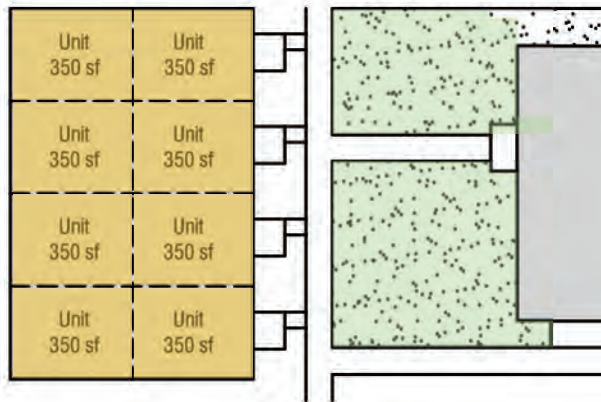
RV PAD



- **± \$ 216,000** per unit.
- **± 2,000 SF RV PAD.**
- Full hookups.



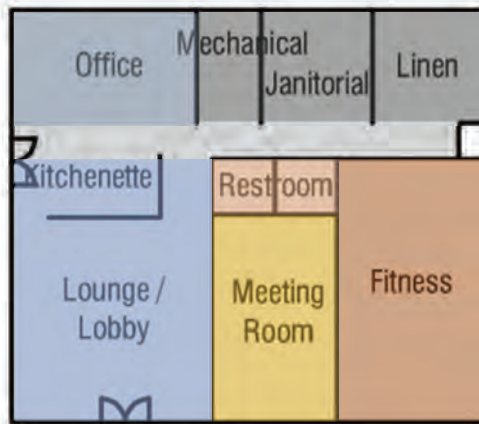
GUEST LODGE / HOTEL



- \pm \$ 250,000 per unit.
- \pm 350 SF per unit.
- Typical hotel unit layout without kitchenette.



GUEST AMENITY

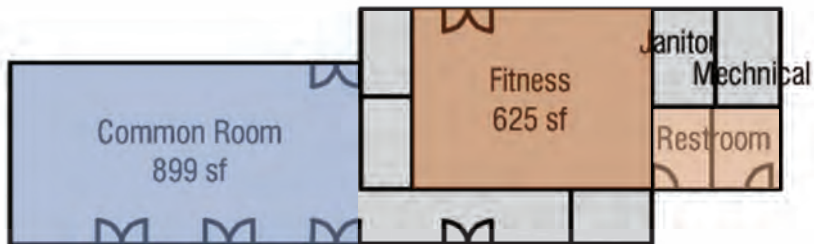


- \pm **\$ 1.65 M** per facility.
- \pm **2,000 SF** of building.
- Kitchenette, laundry, linen, office, small fitness, meeting room, janitorial, utility etc.



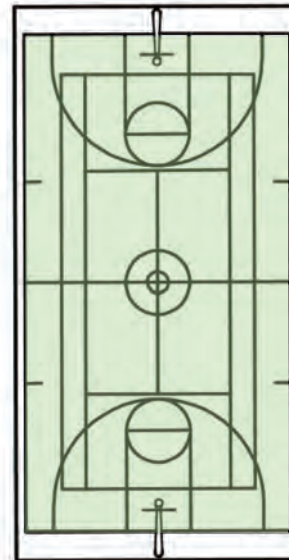
VILLAGE AMENITY: TOTAL COST = 4.4M

CLUB HOUSE



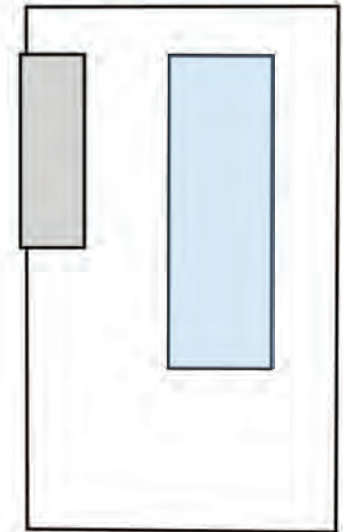
- \pm \$ 2.1 M per facility.
- \pm 2,500 SF of building.
- Fitness, common room, and utility etc.

OUTDOOR FENCED SPORT COURT



- \pm \$ 465,000 per facility.
- Basketball and tennis court.

POOL W/ SHADE STRUCTURE

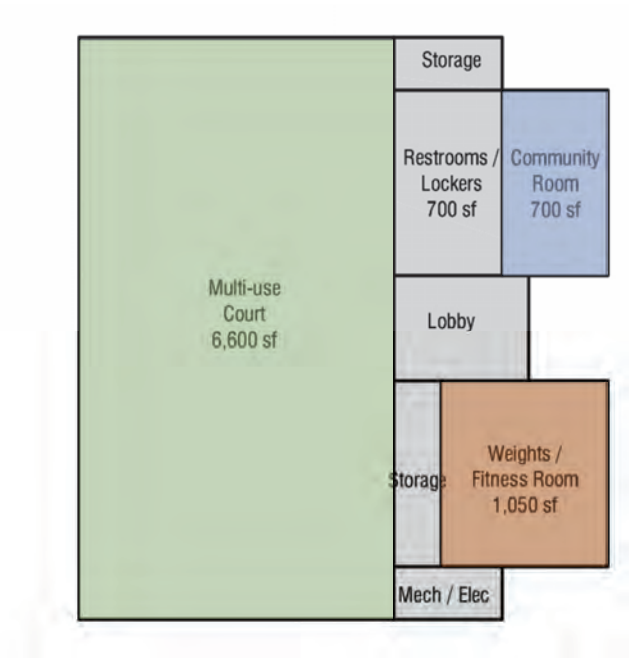


- \pm \$ 1.8M per unit.



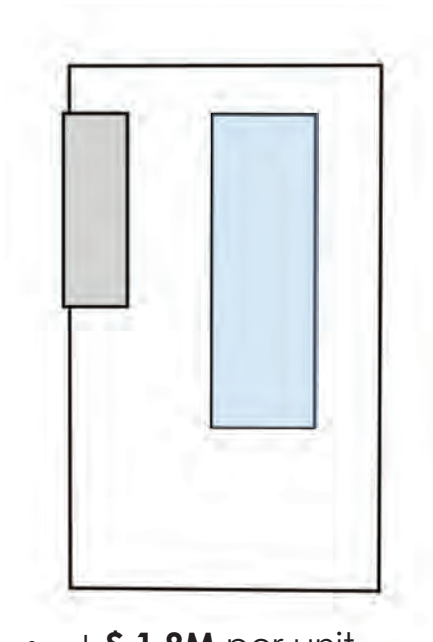
UPGRADED VILLAGE AMENITY: TOTAL COST 10.3M

MULTI-PURPOSE FITNESS COMPLEX



\$ 8.5 M per facility.
10,000 SF of building.
indoor soccer field, fitness,
and community room etc.

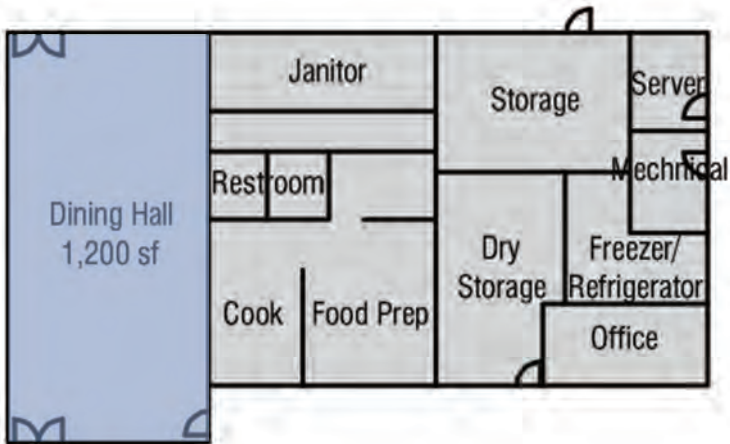
POOL W/
SHADE STRUCTURE



- **± \$ 1.8M** per unit.



KITCHEN / DINING



- ± \$ 4.4 M per facility.
- ± 4,000 SF of building.

DETAILED ROM COSTS

- ROUGH ORDER OF MAGNITUDE(ROM)
STATEMENT OF PROBABLE COST - REVISION 1, DECEMBER 2023 144
- ROUGH ORDER OF MAGNITUDE(ROM)
STATEMENT OF PROBABLE COST - REVISION 1, FEBRUARY 2024 192
- SITE COST FOR PHASED PROJECT 202

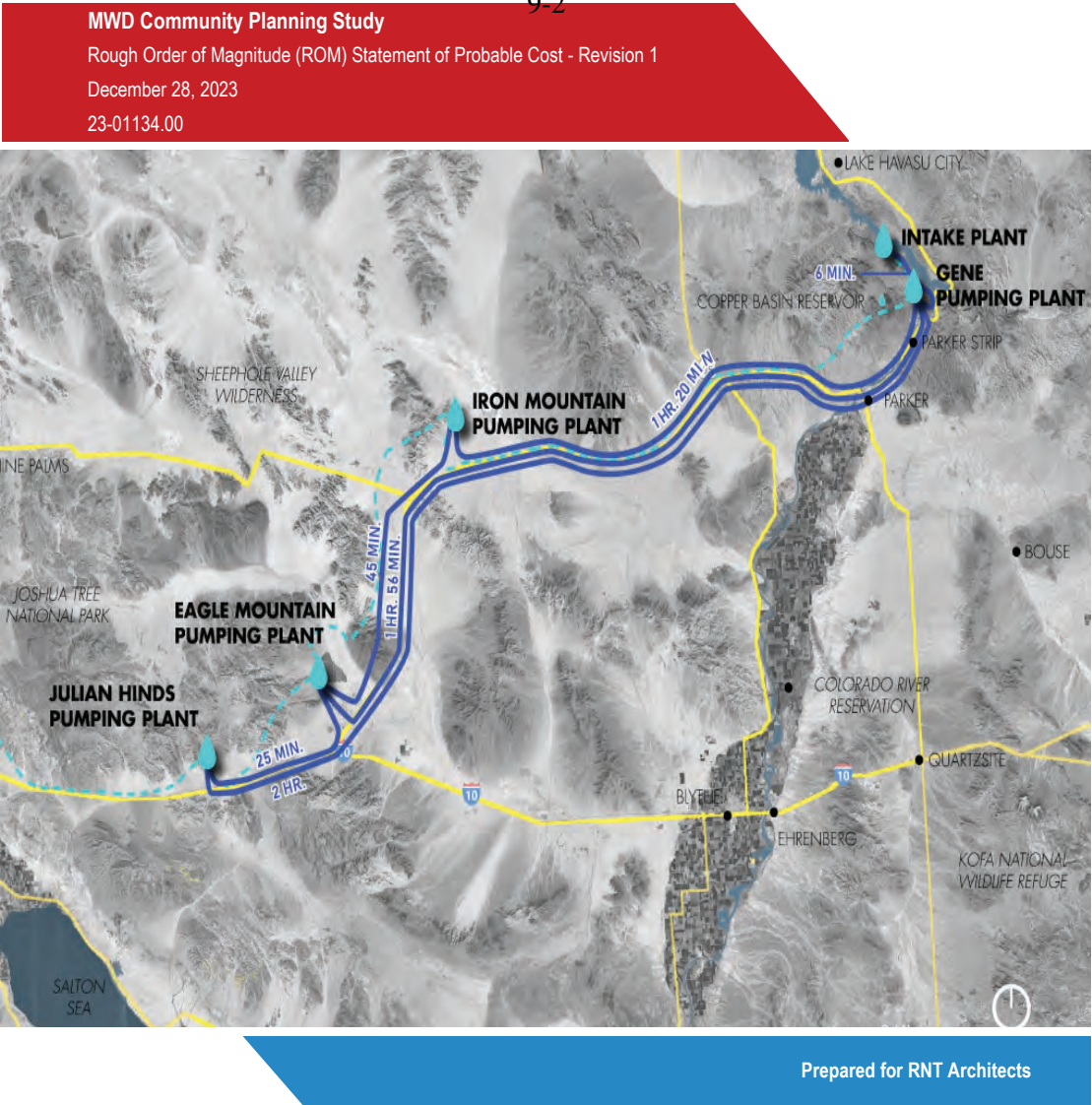


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3. Construction Cost Back Up	
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Scenario 5B - One Village at Gene	30
Scenario 6 - One New Western Village	34
Scenario 7 - No Villages	38
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INTRODUCTION

Basis of Estimate	<p>This Rough Order of Magnitude Statement of Probable Cost is based on the following information provided by RNT Architects on October 31, 2023 and discussions with the architect,</p> <ul style="list-style-type: none">- Village Strategies for MWD housing and property improvements program at five existing desert facilities, based on the studies prepared by Civitas, dated October 26, 2023- Summary of Village Strategies: Quantitative Measures prepared by Civitas, received on November 2, 2023- Housing and Amenity cost models prepared by RNT, received on November 1, 2023- RFI clarifications provided by RNT Architects on November 1, 2023- Discussions with the design team
Estimate Format	<p>A component cost classification format has been used for the preparation of this estimate. It classifies costs by building system / element.</p>
Construction Schedule	<p>A construction schedule to the above strategies is to be developed.</p>
Method of Procurement	<p>The estimate is based on the owner employing a Construction Manager who will prepare subcontractor bid packages and oversee the project</p>
Bid Conditions	<p>This estimate is based on competitive bid situations (minimum of 4 bidders) for all items of subcontracted work.</p>
Basis For Quantities	<p>Wherever possible, this estimate has been based upon the actual measurement of different items of work. For the remaining items, parametric measurements were used in conjunction with other projects of a similar nature.</p>
Basis for Unit Costs	<p>Unit costs as contained herein are based on current bid prices in Blythe, CA. Sub overheads and profit are included in each line item unit cost. Their overhead and profit covers each sub's cost for labor burden, materials, and equipment, sales taxes, field overhead, home office overhead, and profit. The general contractor's overhead is shown separately on the master summary.</p>
Sources for Pricing	<p>This estimate was prepared by a team of qualified cost consultants experienced in estimating construction costs at all stages of design. These consultants have used pricing data from Cumming's database for construction, updated to reflect current conditions in Blythe, CA.</p>
Key Exclusions	<p>The following items have been excluded from our estimate:</p> <ul style="list-style-type: none">- Professional fees, inspections and testing- Plan check fees and building permit fees- Escalation- Land costs- Construction contingency costs- Accommodation and transport for construction crew to complete the job- Off-hours work- Work to the existing infrastructure- Move management / relocation costs- Owner supplied equipment and furniture- Hazardous materials remediation or removal

INTRODUCTION

Items Affecting Cost Estimate	<p>Items which may change the estimated construction cost include, but are not limited to:</p> <ul style="list-style-type: none">- Modifications to the scope of work included in this estimate.- Unforeseen sub-surface conditions.- Restrictive technical specifications or excessive contract conditions.- Any specified item of material or product that cannot be obtained from 3 sources.- Any other non-competitive bid situations.- Bids delayed beyond the projected schedule.
Statement of Probable Cost	<p>Cumming has no control over the cost of labor and materials, the general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This estimate is made on the basis of the experience, qualifications, and best judgement of a professional consultant familiar with the construction industry. Cumming, however, cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent cost estimates.</p> <p>Cumming's staff of professional cost consultants has prepared this estimate in accordance with generally accepted principles and practices. This staff is available to discuss its contents with any interested party.</p> <p>Pricing reflects probable construction costs obtainable in the project locality on the target dates specified and is a determination of fair market value for the construction of this project. The estimate is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all sub and general contractors with a range of 3 - 4 bidders for all items of work. Experience and research indicates that a fewer number of bidders may result in higher bids. Conversely, an increased number of bidders may result in more competitive bid day responses.</p>
Recommendations	<p>Cumming recommends that the Owner and the Architect carefully review this entire document to ensure it reflects their design intent. Requests for modifications of any apparent errors or omissions to this document must be made to Cumming within ten days of receipt of this estimate. Otherwise, it will be assumed that its contents have been reviewed and accepted. If the project is over budget or there are unresolved budget issues, alternate systems / schemes should be evaluated before proceeding into further design phases.</p> <p>It is recommended that there are preparations of further cost estimates throughout design by Cumming to determine overall cost changes since the preparation of this preliminary estimate. These future estimates will have detailed breakdowns indicating materials by type, kind, and size, priced by their respective units of measure.</p>

SUMMARY		
Element		Total
Scenario 1 - Four Villages	\$ \$ \$	\$270,320,000
Scenario 2 - Three Villages	\$ \$ \$ \$	\$288,517,600
Scenario 3 - Two Villages	\$ \$ \$ \$ \$	\$288,735,600
Scenario 4 - Two Desert Villages & De-Commission Gene Village	\$	\$237,255,000
Scenario 5 - One Western Village	\$ \$ \$ \$ \$ \$	\$289,057,000
Scenario 5B - One Village at Gene	\$ \$ \$ \$ \$ \$ \$	\$297,977,000
Scenario 6 - One New Western Village	\$ \$ \$ \$ \$ \$ \$ \$	\$328,927,000
Scenario 7 - No Villages	\$ \$	\$254,144,000
Scenario 7B - No Villages	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	\$329,994,000

SUMMARY MATRIX

	Scenario 1 - Four Villages	Scenario 2 - Three Villages	Scenario 3 - Two Villages	Scenario 4 - Two Desert Villages & De-Commission Gene Village	Scenario 5 - One Western Village	Scenario 5B - One Village at Gene	Scenario 6 - One New Western Village	Scenario 7 - No Villages	Scenario 7B - No Villages
Element	Total	Total	Total	Total	Total	Total	Total	Total	Total
01 Permanent Housing	\$136,500,000	\$136,500,000	\$136,500,000	\$58,500,000	\$88,400,000	\$89,700,000	\$88,400,000		
02 Temporary / On-Call / Guest Lodges	\$37,100,000	\$38,160,000	\$39,220,000	\$39,220,000	\$40,280,000	\$49,820,000	\$41,340,000	\$37,100,000	\$111,300,000
03 Kitchen / Dining Facilities	\$14,040,000	\$14,040,000	\$18,480,000	\$17,325,000	\$18,720,000	\$11,550,000	\$18,480,000	\$23,100,000	\$23,400,000
04 Village Amenity Packages	\$72,180,000	\$59,930,000	\$39,340,000	\$37,060,000	\$25,157,000	\$25,157,000	\$25,157,000	\$72,180,000	\$72,180,000
05 Guest Amenity Packages	\$10,500,000	\$10,800,000	\$11,100,000	\$11,100,000	\$8,850,000	\$14,100,000	\$11,400,000	\$300,000	\$600,000
06 Infrastructure Cost		\$29,087,600	\$44,095,600	\$74,050,000	\$107,650,000	\$107,650,000	\$144,150,000	\$121,464,000	\$122,514,000
Subtotal Cost	\$270,320,000	\$288,517,600	\$288,735,600	\$237,255,000	\$289,057,000	\$297,977,000	\$328,927,000	\$254,144,000	\$329,994,000
	\$ \$ \$	\$ \$ \$ \$	\$ \$ \$ \$ \$	\$	\$ \$ \$ \$ \$ \$	\$ \$ \$ \$ \$ \$ \$	\$ \$ \$ \$ \$ \$ \$ \$	\$ \$	\$ \$ \$ \$ \$ \$ \$ \$ \$

Scenario 1 - Four Villages

SUMMARY - SCENARIO 1 - FOUR VILLAGES	
Element	Total
01 Permanent Housing	\$136,500,000
02 Temporary / On-Call / Guest Lodges	\$37,100,000
03 Kitchen / Dining Facilities	\$14,040,000
04 Village Amenity Packages	\$72,180,000
05 Guest Amenity Packages	\$10,500,000
06 Infrastructure Cost	
TOTAL ESTIMATED CONSTRUCTION COST	
	\$270,320,000

DETAIL ELEMENTS - SCENARIO 1 - FOUR VILLAGES

Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
Hinds 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	15	ea	\$1,300,000.00	\$19,500,000
Eagle Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	20	ea	\$1,300,000.00	\$26,000,000
Iron Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	33	ea	\$1,300,000.00	\$42,900,000
Gene 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	37	ea	\$1,300,000.00	\$48,100,000
Total - Permanent Housing				\$136,500,000
02 Temporary / On-Call / Guest Lodges				
Gene Guest lodges @ 350SF each unit, single-story	26	ea	\$530,000.00	\$13,780,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	25	ea	\$530,000.00	\$13,250,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$37,100,000
03 Kitchen / Dining Facilities				
Hinds Commercial grade kitchen and dining service, small	4,000	sf	\$1,170.00	\$4,680,000
Eagle Mountain Commercial grade kitchen and dining service, small	4,000	sf	\$1,170.00	\$4,680,000
Iron Mountain Commercial grade kitchen and dining service, small	4,000	sf	\$1,170.00	\$4,680,000
Total - Kitchen / Dining Facilities				\$14,040,000

DETAIL ELEMENTS - SCENARIO 1 - FOUR VILLAGES

Element	Quantity	Unit	Unit Cost	Total
04 Village Amenity Packages				
Hinds - Area: 370,000 SF	1	ea	\$12,250,000.00	\$12,250,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	226,775	sf		
Eagle Mountain - Area: 780,000 SF	1	ea	\$16,470,000.00	\$16,470,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	590,825	sf		
Iron Mountain - Area: 770,000 SF	1	ea	\$20,590,000.00	\$20,590,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	474,025	sf		
Gene - Area: 960,000 SF	1	ea	\$22,870,000.00	\$22,870,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	635,675	sf		

Total - Village Amenity Packages

\$72,180,000

05 Guest Amenity Packages in the lodge

Eagle Mountain: 17 Guest Lodges	1	ea	\$2,550,000.00	\$2,550,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 25 Guest Lodges	1	ea	\$3,750,000.00	\$3,750,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

DETAIL ELEMENTS - SCENARIO 1 - FOUR VILLAGES			
Element	Quantity	Unit	Unit Cost Total
Gene: 26 Guest Lodges	1	ea	\$3,900,000.00 \$3,900,000
Gym with weights and cardio room	1,500	sf	
Common dining area	500	sf	
Entertainment room / lounge	1,000	sf	
Meeting room	125	sf	
Intake: 2 Guest Lodges	1	ea	\$300,000.00 \$300,000
Gym with weights and cardio room	1,500	sf	
Common dining area	500	sf	
Entertainment room / lounge	1,000	sf	
Meeting room	125	sf	
Total - Guest Amenity Packages			\$10,500,000
06 Infrastructure Cost			
No scope / work anticipated			
Total - Infrastructure Cost			

Scenario 2 - Three Villages

SUMMARY - SCENARIO 2 - THREE VILLAGES	
Element	Total
01 Permanent Housing	\$136,500,000
02 Temporary / On-Call / Guest Lodges	\$38,160,000
03 Kitchen / Dining Facilities	\$14,040,000
04 Village Amenity Packages	\$59,930,000
05 Guest Amenity Packages	\$10,800,000
06 Infrastructure Cost	\$29,087,600
TOTAL ESTIMATED CONSTRUCTION COST	\$288,517,600

DETAIL ELEMENTS - SCENARIO 2 - THREE VILLAGES

Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
Eagle Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	35	ea	\$1,300,000.00	\$45,500,000
Iron Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	33	ea	\$1,300,000.00	\$42,900,000
Gene 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	37	ea	\$1,300,000.00	\$48,100,000
Total - Permanent Housing				\$136,500,000
02 Temporary / On-Call / Guest Lodges				
Hinds Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	25	ea	\$530,000.00	\$13,250,000
Gene Guest lodges @ 350SF each unit, single-story	26	ea	\$530,000.00	\$13,780,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$38,160,000
03 Kitchen / Dining Facilities				
Eagle Mountain Commercial grade kitchen and dining service, small	4,000	sf	\$1,170.00	\$4,680,000
Iron Mountain Commercial grade kitchen and dining service, small	4,000	sf	\$1,170.00	\$4,680,000
Gene Commercial grade kitchen and dining service, small	4,000	sf	\$1,170.00	\$4,680,000
Total - Kitchen / Dining Facilities				\$14,040,000

DETAIL ELEMENTS - SCENARIO 2 - THREE VILLAGES

Element	Quantity	Unit	Unit Cost	Total
04 Village Amenity Packages				
Eagle Mountain - Area: 780,000 SF	1	ea	\$16,470,000.00	\$16,470,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	470,825	sf		
Iron Mountain - Area: 770,000 SF	1	ea	\$20,590,000.00	\$20,590,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	477,150	sf		
Gene - Area: 960,000 SF	1	ea	\$22,870,000.00	\$22,870,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	634,800	sf		

Total - Village Amenity Packages				\$59,930,000
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05 Guest Amenity Packages in the lodge

Hinds: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Eagle Mountain: 17 Guest Lodges	1	ea	\$2,550,000.00	\$2,550,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 25 Guest Lodges	1	ea	\$3,750,000.00	\$3,750,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

DETAIL ELEMENTS - SCENARIO 2 - THREE VILLAGES				
Element	Quantity	Unit	Unit Cost	Total
Gene: 26 Guest Lodges	1	ea	\$3,900,000.00	\$3,900,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Total - Guest Amenity Packages				\$10,800,000
06 Infrastructure Cost				
Eagle Mountain				
New underground utilities	397,100	sf	\$15.00	\$5,956,500
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	397,100	sf	\$6.00	\$2,382,600
Earthwork, hardscape, landscape and misc. specialties	397,100	sf	\$35.00	\$13,898,500
Total - Infrastructure Cost				\$29,087,600

Scenario 3 - Two Villages

SUMMARY - SCENARIO 3 - TWO VILLAGES	
Element	Total
01 Permanent Housing	\$136,500,000
02 Temporary / On-Call / Guest Lodges	\$39,220,000
03 Kitchen / Dining Facilities	\$18,480,000
04 Village Amenity Packages	\$39,340,000
05 Guest Amenity Packages	\$11,100,000
06 Infrastructure Cost	\$44,095,600
TOTAL ESTIMATED CONSTRUCTION COST	\$288,735,600

DETAIL ELEMENTS - SCENARIO 3 - TWO VILLAGES

Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
Eagle Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	68	ea	\$1,300,000.00	\$88,400,000
Gene 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	37	ea	\$1,300,000.00	\$48,100,000
Total - Permanent Housing				\$136,500,000
02 Temporary / On-Call / Guest Lodges				
Hinds Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	27	ea	\$530,000.00	\$14,310,000
Gene Guest lodges @ 350SF each unit, single-story	26	ea	\$530,000.00	\$13,780,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$39,220,000
03 Kitchen / Dining Facilities				
Eagle Mountain Commercial grade of kitchen and dining service, large	8,000	sf	\$1,155.00	\$9,240,000
Gene Commercial grade of kitchen and dining service, large	8,000	sf	\$1,155.00	\$9,240,000
Total - Kitchen / Dining Facilities				\$18,480,000
04 Village Amenity Packages				
Eagle Mountain - Area: 780,000 SF	1	ea	\$16,470,000.00	\$16,470,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		

DETAIL ELEMENTS - SCENARIO 3 - TWO VILLAGES

Element	Quantity	Unit	Unit Cost	Total
Shade trees and landscaping	210,825	sf		
Gene - Area: 960,000 SF	1	ea	\$22,870,000.00	\$22,870,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	627,675	sf		
Total - Village Amenity Packages				\$39,340,000

05 Guest Amenity Packages in the lodge

Hinds: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Eagle Mountain: 17 Guest Lodges	1	ea	\$2,550,000.00	\$2,550,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 25 Guest Lodges	1	ea	\$4,050,000.00	\$4,050,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Gene: 26 Guest Lodges	1	ea	\$3,900,000.00	\$3,900,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Total - Guest Amenity Packages				\$11,100,000

DETAIL ELEMENTS - SCENARIO 3 - TWO VILLAGES			
Element	Quantity	Unit	Unit Cost Total
06 Infrastructure Cost			
Eagle Mountain			
New underground utilities	665,100	sf	\$15.00 \$9,976,500
New water treatment system including installation	1	ea	\$6,850,000.00 \$6,850,000
New septic system	665,100	sf	\$6.00 \$3,990,600
Earthwork, hardscape, landscape and misc. specialties	665,100	sf	\$35.00 \$23,278,500
Total - Infrastructure Cost			\$44,095,600

Scenario 4 - Two Desert Villages & De-Commission Gene Village

SUMMARY - SCENARIO 4 - TWO DESERT VILLAGES & DE-COMMISSION GENE VILLAGE	
Element	Total
01 Permanent Housing	\$58,500,000
02 Temporary / On-Call / Guest Lodges	\$39,220,000
03 Kitchen / Dining Facilities	\$17,325,000
04 Village Amenity Packages	\$37,060,000
05 Guest Amenity Packages	\$11,100,000
06 Infrastructure Cost	\$74,050,000
TOTAL ESTIMATED CONSTRUCTION COST	\$237,255,000

DETAIL ELEMENTS - SCENARIO 4 - TWO DESERT VILLAGES & DE-COMMISSION GENE VILLAGE

Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
Eagle Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	12	ea	\$1,300,000.00	\$15,600,000
Iron Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	33	ea	\$1,300,000.00	\$42,900,000
Total - Permanent Housing				\$58,500,000
02 Temporary / On-Call / Guest Lodges				
Hinds Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	25	ea	\$530,000.00	\$13,250,000
Gene Guest lodges @ 350SF each unit, single-story	28	ea	\$530,000.00	\$14,840,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$39,220,000
03 Kitchen / Dining Facilities				
Eagle Mountain Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Iron Mountain Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Gene Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Total - Kitchen / Dining Facilities				\$17,325,000
04 Village Amenity Packages				
Eagle Mountain - Area: 780,000 SF	1	ea	\$16,470,000.00	\$16,470,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		

DETAIL ELEMENTS - SCENARIO 4 - TWO DESERT VILLAGES & DE-COMMISSION GENE VILLAGE

Element	Quantity	Unit	Unit Cost	Total
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	653,825	sf		
Iron Mountain - Area: 770,000 SF	1	ea	\$20,590,000.00	\$20,590,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	473,025	sf		

Total - Village Amenity Packages**\$37,060,000****05 Guest Amenity Packages in the lodge**

Hinds: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Eagle Mountain: 17 Guest Lodges	1	ea	\$2,550,000.00	\$2,550,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 25 Guest Lodges	1	ea	\$3,750,000.00	\$3,750,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Gene: 28 Guest Lodges	1	ea	\$4,200,000.00	\$4,200,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

Total - Guest Amenity Packages**\$11,100,000**

DETAIL ELEMENTS - SCENARIO 4 - TWO DESERT VILLAGES & DE-COMMISSION GENE VILLAGE			
Element	Quantity	Unit	Unit Cost Total
06 Infrastructure Cost			
Eagle Mountain			
New underground utilities	1,200,000	sf	\$15.00 \$18,000,000
New water treatment system including installation	1	ea	\$6,850,000.00 \$6,850,000
New septic system	1,200,000	sf	\$6.00 \$7,200,000
Earthwork, hardscape, landscape and misc. specialties	1,200,000	sf	\$35.00 \$42,000,000
Total - Infrastructure Cost			\$74,050,000

Scenario 5 - One Western Village

SUMMARY - SCENARIO 5 - ONE WESTERN VILLAGE	
Element	Total
01 Permanent Housing	\$88,400,000
02 Temporary / On-Call / Guest Lodges	\$40,280,000
03 Kitchen / Dining Facilities	\$18,720,000
04 Village Amenity Packages	\$25,157,000
05 Guest Amenity Packages	\$8,850,000
06 Infrastructure Cost	\$107,650,000
TOTAL ESTIMATED CONSTRUCTION COST	\$289,057,000

DETAIL ELEMENTS - SCENARIO 5 - ONE WESTERN VILLAGE				
Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
Eagle Mountain 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	68	ea	\$1,300,000.00	\$88,400,000
Total - Permanent Housing				\$88,400,000
02 Temporary / On-Call / Guest Lodges				
Hinds Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	27	ea	\$530,000.00	\$14,310,000
Gene Guest lodges @ 350SF each unit, single-story	28	ea	\$530,000.00	\$14,840,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$40,280,000
03 Kitchen / Dining Facilities				
Eagle Mountain Commercial grade of kitchen and dining service, large	8,000	sf	\$1,170.00	\$9,360,000
Gene Commercial grade of kitchen and dining service, large	8,000	sf	\$1,170.00	\$9,360,000
Total - Kitchen / Dining Facilities				\$18,720,000
04 Village Amenity Packages				
Eagle Mountain - Area: 780,000 SF	1	ea	\$25,157,000.00	\$25,157,000
Climate controlled indoor fitness complex	10,000	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	209,550	sf		
Total - Village Amenity Packages				\$25,157,000

DETAIL ELEMENTS - SCENARIO 5 - ONE WESTERN VILLAGE

Element	Quantity	Unit	Unit Cost	Total
05 Guest Amenity Packages in the lodge				
Hinds: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 27 Guest Lodges	1	ea	\$4,050,000.00	\$4,050,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Gene: 28 Guest Lodges	1	ea	\$4,200,000.00	\$4,200,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Total - Guest Amenity Packages				\$8,850,000
06 Infrastructure Cost				
Eagle Mountain				
New underground utilities	1,800,000	sf	\$15.00	\$27,000,000
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	1,800,000	sf	\$6.00	\$10,800,000
Earthwork, hardscape, landscape and misc. specialties	1,800,000	sf	\$35.00	\$63,000,000
Total - Infrastructure Cost				\$107,650,000

Scenario 5B - One Village at Gene

SUMMARY - SCENARIO 5B - ONE VILLAGE AT GENE	
Element	Total
01 Permanent Housing	\$89,700,000
02 Temporary / On-Call / Guest Lodges	\$49,820,000
03 Kitchen / Dining Facilities	\$11,550,000
04 Village Amenity Packages	\$25,157,000
05 Guest Amenity Packages	\$14,100,000
06 Infrastructure Cost	\$107,650,000
TOTAL ESTIMATED CONSTRUCTION COST	\$297,977,000

DETAIL ELEMENTS - SCENARIO 5B - ONE VILLAGE AT GENE

Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
Gene 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	69	ea	\$1,300,000.00	\$89,700,000
Total - Permanent Housing				\$89,700,000
02 Temporary / On-Call / Guest Lodges				
Hinds Guest lodges @ 350SF each unit, single-story	8	ea	\$530,000.00	\$4,240,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	25	ea	\$530,000.00	\$13,250,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	33	ea	\$530,000.00	\$17,490,000
Gene Guest lodges @ 350SF each unit, single-story	26	ea	\$530,000.00	\$13,780,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$49,820,000
03 Kitchen / Dining Facilities				
Eagle Mountain Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Gene Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Total - Kitchen / Dining Facilities				\$11,550,000
04 Village Amenity Packages				
Gene - Area: 960,000 SF	1	ea	\$25,157,000.00	\$25,157,000
Climate controlled indoor fitness complex	10,000	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	378,275	sf		
Total - Village Amenity Packages				\$25,157,000

DETAIL ELEMENTS - SCENARIO 5B - ONE VILLAGE AT GENE

Element	Quantity	Unit	Unit Cost	Total
05 Guest Amenity Packages in the lodge				
Hinds: 8 Guest Lodges	1	ea	\$1,200,000.00	\$1,200,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Eagle Mountain: 25 Guest Lodges	1	ea	\$3,750,000.00	\$3,750,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 33 Guest Lodges	1	ea	\$4,950,000.00	\$4,950,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Gene: 26 Guest Lodges	1	ea	\$3,900,000.00	\$3,900,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

Total - Guest Amenity Packages

\$14,100,000

06 Infrastructure Cost

Gene				
New underground utilities	1,800,000	sf	\$15.00	\$27,000,000
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	1,800,000	sf	\$6.00	\$10,800,000
Earthwork, hardscape, landscape and misc. specialties	1,800,000	sf	\$35.00	\$63,000,000

Total - Infrastructure Cost

\$107,650,000

Scenario 6 - One New Western Village

SUMMARY - SCENARIO 6 - ONE NEW WESTERN VILLAGE	
Element	Total
01 Permanent Housing	\$88,400,000
02 Temporary / On-Call / Guest Lodges	\$41,340,000
03 Kitchen / Dining Facilities	\$18,480,000
04 Village Amenity Packages	\$25,157,000
05 Guest Amenity Packages	\$11,400,000
06 Infrastructure Cost	\$144,150,000
TOTAL ESTIMATED CONSTRUCTION COST	\$328,927,000

DETAIL ELEMENTS - SCENARIO 6 - ONE NEW WESTERN VILLAGE

Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
New West Village 3bed/2bath incl. 2 car garage, 1,350SF each unit, single-story	68	ea	\$1,300,000.00	\$88,400,000
Total - Permanent Housing				\$88,400,000
02 Temporary / On-Call / Guest Lodges				
Hinds Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	27	ea	\$530,000.00	\$14,310,000
Gene Guest lodges @ 350SF each unit, single-story	28	ea	\$530,000.00	\$14,840,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
New West Village Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$41,340,000
03 Kitchen / Dining Facilities				
New West Village Commercial grade of kitchen and dining service, large	8,000	sf	\$1,155.00	\$9,240,000
Gene Commercial grade of kitchen and dining service, large	8,000	sf	\$1,155.00	\$9,240,000
Total - Kitchen / Dining Facilities				\$18,480,000
04 Village Amenity Packages				
New West Village - Area: 1,056,000 SF	1	ea	\$25,157,000.00	\$25,157,000
Climate controlled indoor fitness complex	10,000	sf		
Outdoor shade structure in common area	1	ea		
Playground	2,500	sf		
Shade trees and landscaping	487,675	sf		
Total - Village Amenity Packages				\$25,157,000

DETAIL ELEMENTS - SCENARIO 6 - ONE NEW WESTERN VILLAGE

Element	Quantity	Unit	Unit Cost	Total
05 Guest Amenity Packages in the lodge				
Hinds: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Eagle Mountain: 17 Guest Lodges	1	ea	\$2,550,000.00	\$2,550,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Iron Mountain: 27 Guest Lodges	1	ea	\$4,050,000.00	\$4,050,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Gene: 28 Guest Lodges	1	ea	\$4,200,000.00	\$4,200,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		
Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

Total - Guest Amenity Packages

\$11,400,000

06 Infrastructure Cost

New West Village				
New underground utilities	1,800,000	sf	\$30.00	\$54,000,000
New stormwater management, incl. UG detention	1,800,000	sf	\$5.00	\$9,000,000
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	1,800,000	sf	\$6.00	\$10,800,000
Environmental mitigation	1	ls	\$500,000.00	\$500,000
Earthwork, hardscape, landscape and misc specialties	1,800,000	sf	\$35.00	\$63,000,000

Total - Infrastructure Cost

\$144,150,000

Scenario 7 - No Villages

SUMMARY - SCENARIO 7 - NO VILLAGES	
Element	Total
01 Permanent Housing	
02 Temporary / On-Call / Guest Lodges	\$37,100,000
03 Kitchen / Dining Facilities	\$23,100,000
04 Village Amenity Packages	\$72,180,000
05 Guest Amenity Packages	\$300,000
06 Infrastructure Cost	\$121,464,000
TOTAL ESTIMATED CONSTRUCTION COST	\$254,144,000

DETAIL ELEMENTS - SCENARIO 7 - NO VILLAGES				
Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
No scope / work anticipated				
Total - Permanent Housing				
02 Temporary / On-Call / Guest Lodges				
Eagle Mountain Guest lodges @ 350SF each unit, single-story	17	ea	\$530,000.00	\$9,010,000
Iron Mountain Guest lodges @ 350SF each unit, single-story	25	ea	\$530,000.00	\$13,250,000
Gene Guest lodges @ 350SF each unit, single-story	26	ea	\$530,000.00	\$13,780,000
Intake Guest lodges @ 350SF each unit, single-story	2	ea	\$530,000.00	\$1,060,000
Total - Temporary / On-Call / Guest Lodges				\$37,100,000
03 Kitchen / Dining Facilities				
Hinds Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Eagle Mountain Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Iron Mountain Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Gene Commercial grade of kitchen and dining service, large	5,000	sf	\$1,155.00	\$5,775,000
Total - Kitchen / Dining Facilities				\$23,100,000
04 Village Amenity Packages				
Hinds - Area: 370,000 SF	1	ea	\$12,250,000.00	\$12,250,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	351,400	sf		

DETAIL ELEMENTS - SCENARIO 7 - NO VILLAGES

Element	Quantity	Unit	Unit Cost	Total
Eagle Mountain - Area: 780,000 SF	1	ea	\$16,470,000.00	\$16,470,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	755,450	sf		
Iron Mountain - Area: 770,000 SF	1	ea	\$20,590,000.00	\$20,590,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	742,650	sf		
Gene - Area: 960,000 SF	1	ea	\$22,870,000.00	\$22,870,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	932,300	sf		

Total - Village Amenity Packages

\$72,180,000

05 Guest Amenity Packages in the lodge

Intake: 2 Guest Lodges	1	ea	\$300,000.00	\$300,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

Total - Guest Amenity Packages

\$300,000

06 Infrastructure Cost

Hinds				
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	88,000	sf	\$6.00	\$528,000
Earthwork, hardscape, landscape and misc. specialties, improvements	370,000	sf	\$15.00	\$5,550,000
Underground utility improvements	370,000	sf	\$10.00	\$3,700,000
Eagle Mountain				
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	221,000	sf	\$6.00	\$1,326,000
Earthwork, hardscape, landscape and misc. specialties, improvements	780,000	sf	\$15.00	\$11,700,000
Underground utility improvements	780,000	sf	\$10.00	\$7,800,000
Iron Mountain				
New water treatment system including installation	1	ea	\$6,865,000.00	\$6,865,000
New septic system	309,000	sf	\$6.00	\$1,854,000
Earthwork, hardscape, landscape and misc. specialties, improvements	770,000	sf	\$15.00	\$11,550,000

Project # 23-01134.00
12/28/23

DETAIL ELEMENTS - SCENARIO 7 - NO VILLAGES			
Element	Quantity	Unit	Unit Cost Total
Underground utility improvements	770,000	sf	\$10.00 \$7,700,000
Gene			
New water treatment system including installation	1	ea	\$6,865,000.00 \$6,865,000
New septic system	290,000	sf	\$6.00 \$1,740,000
Earthwork, hardscape, landscape and misc. specialties, improvements	960,000	sf	\$15.00 \$14,400,000
Underground utility improvements	960,000	sf	\$10.00 \$9,600,000
Intake			
New water treatment system including installation	1	ea	\$6,850,000.00 \$6,850,000
New septic system	81,000	sf	\$6.00 \$486,000
Earthwork, hardscape, landscape and misc. specialties, improvements	370,000	sf	\$15.00 \$5,550,000
Underground utility improvements	370,000	sf	\$10.00 \$3,700,000
Total - Infrastructure Cost			\$121,464,000

Scenario 7B - No Villages

SUMMARY - SCENARIO 7B - NO VILLAGES	
Element	Total
01 Permanent Housing	
02 Temporary / On-Call / Guest Lodges	\$111,300,000
03 Kitchen / Dining Facilities	\$23,400,000
04 Village Amenity Packages	\$72,180,000
05 Guest Amenity Packages	\$600,000
06 Infrastructure Cost	\$122,514,000
TOTAL ESTIMATED CONSTRUCTION COST	\$329,994,000

Project # 23-01134.00
12/28/23

DETAIL ELEMENTS - SCENARIO 7B - NO VILLAGES				
Element	Quantity	Unit	Unit Cost	Total
01 Permanent Housing				
No scope / work anticipated				
Total - Permanent Housing				
02 Temporary / On-Call / Guest Lodges				
Hinds				
Guest lodges @ 750SF each unit, single-story	20	ea	\$1,060,000.00	\$21,200,000
Eagle Mountain				
Guest lodges @ 750SF each unit, single-story	33	ea	\$1,060,000.00	\$34,980,000
Iron Mountain				
Guest lodges @ 750SF each unit, single-story	38	ea	\$1,060,000.00	\$40,280,000
Gene				
Guest lodges @ 750SF each unit, single-story	10	ea	\$1,060,000.00	\$10,600,000
Intake				
Guest lodges @ 750SF each unit, single-story	4	ea	\$1,060,000.00	\$4,240,000
Total - Temporary / On-Call / Guest Lodges				\$111,300,000
03 Kitchen / Dining Facilities				
Hinds				
Commercial grade of kitchen and dining service, large	5,000	sf	\$1,170.00	\$5,850,000
Eagle Mountain				
Commercial grade of kitchen and dining service, large	5,000	sf	\$1,170.00	\$5,850,000
Iron Mountain				
Commercial grade of kitchen and dining service, large	5,000	sf	\$1,170.00	\$5,850,000
Gene				
Commercial grade of kitchen and dining service, large	5,000	sf	\$1,170.00	\$5,850,000
Total - Kitchen / Dining Facilities				\$23,400,000
04 Village Amenity Packages				
Hinds - Area: 370,000 SF	1	ea	\$12,250,000.00	\$12,250,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		

DETAIL ELEMENTS - SCENARIO 7B - NO VILLAGES

Element	Quantity	Unit	Unit Cost	Total
Shade trees and landscaping	336,400	sf		
Eagle Mountain - Area: 780,000 SF	1	ea	\$16,470,000.00	\$16,470,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	736,650	sf		
Iron Mountain - Area: 770,000 SF	1	ea	\$20,590,000.00	\$20,590,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	722,900	sf		
Gene - Area: 960,000 SF	1	ea	\$22,870,000.00	\$22,870,000
Club house (incl. fitness center and game room)	2,000	sf		
Pool	5,000	sf		
Basketball / Tennis court	6,600	sf		
Shade trees and landscaping	933,900	sf		

Total - Village Amenity Packages

\$72,180,000

05 Guest Amenity Packages in the lodge

Intake: 4 Guest Lodges	1	ea	\$600,000.00	\$600,000
Gym with weights and cardio room	1,500	sf		
Common dining area	500	sf		
Entertainment room / lounge	1,000	sf		
Meeting room	125	sf		

Total - Guest Amenity Packages

\$600,000

06 Infrastructure Cost

Hinds				
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	188,000	sf	\$6.00	\$1,128,000
Earthwork, hardscape, landscape and misc. specialties, improvements	370,000	sf	\$15.00	\$5,550,000
Underground utility improvements	370,000	sf	\$10.00	\$3,700,000
Eagle Mountain				
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	301,000	sf	\$6.00	\$1,806,000
Earthwork, hardscape, landscape and misc. specialties, improvements	780,000	sf	\$15.00	\$11,700,000
Underground utility improvements	780,000	sf	\$10.00	\$7,800,000
Iron Mountain				
New water treatment system including installation	1	ea	\$6,865,000.00	\$6,865,000

San Diego, CA

Project # 23-01134.00

Rough Order of Magnitude (ROM) SOPC

12/28/23

DETAIL ELEMENTS - SCENARIO 7B - NO VILLAGES				
Element	Quantity	Unit	Unit Cost	Total
New septic system	374,000	sf	\$6.00	\$2,244,000
Earthwork, hardscape, landscape and misc. specialties, improvements	770,000	sf	\$15.00	\$11,550,000
Underground utility improvements	770,000	sf	\$10.00	\$7,700,000
Gene				
New water treatment system including installation	1	ea	\$6,865,000.00	\$6,865,000
New septic system	210,000	sf	\$6.00	\$1,260,000
Earthwork, hardscape, landscape and misc. specialties, improvements	960,000	sf	\$15.00	\$14,400,000
Underground utility improvements	960,000	sf	\$10.00	\$9,600,000
Intake				
New water treatment system including installation	1	ea	\$6,850,000.00	\$6,850,000
New septic system	91,000	sf	\$6.00	\$546,000
Earthwork, hardscape, landscape and misc. specialties, improvements	370,000	sf	\$15.00	\$5,550,000
Underground utility improvements	370,000	sf	\$10.00	\$3,700,000
Total - Infrastructure Cost			\$122,514,000	

MWD Community Planning Study

Rough Order of Magnitude (ROM) SOPC - Revision 1

February 29, 2024

CUMMING
GROUP

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INTRODUCTION	
Basis of Estimate	<p>This Rough Order of Magnitude Statement of Probable Cost is based on the MWD product typologies exhibit provided by RNT Architects on February 13, 2024 including:</p> <ul style="list-style-type: none">- Housing and Amenity cost models prepared by RNT, received on November 1, 2023- Discussions with the design team
Estimate Format	<p>A component cost classification format has been used for the preparation of this estimate. It classifies costs by building system / element.</p>
Construction Schedule	<p>A construction schedule to the above strategies is to be developed.</p>
Method of Procurement	<p>The estimate is based on the owner employing a Construction Manager who will prepare subcontractor bid packages and oversee the project</p>
Bid Conditions	<p>This estimate is based on competitive bid situations (minimum of 4 bidders) for all items of subcontracted work.</p>
Basis For Quantities	<p>Wherever possible, this estimate has been based upon the actual measurement of different items of work. For the remaining items, parametric measurements were used in conjunction with other projects of a similar nature.</p>
Basis for Unit Costs	<p>Unit costs as contained herein are based on current bid prices in Blythe, CA. Sub overheads and profit are included in each line item unit cost. Their overhead and profit covers each sub's cost for labor burden, materials, and equipment, sales taxes, field overhead, home office overhead, and profit. The general contractor's overhead is shown separately on the master summary.</p>
Sources for Pricing	<p>This estimate was prepared by a team of qualified cost consultants experienced in estimating construction costs at all stages of design. These consultants have used pricing data from Cumming's database for construction, updated to reflect current conditions in Blythe, CA.</p>
Key Exclusions	<p>The following items have been excluded from our estimate:</p> <ul style="list-style-type: none">- Professional fees, inspections and testing- Plan check fees and building permit fees- Escalation- Land costs- Construction contingency costs- Accommodation and transport for construction crew to complete the job- Off-hours work- Work to the existing infrastructure- Move management / relocation costs- Owner supplied equipment and furniture- Hazardous materials remediation or removal

INTRODUCTION

Items Affecting Cost Estimate	<p>Items which may change the estimated construction cost include, but are not limited to:</p> <ul style="list-style-type: none">- Modifications to the scope of work included in this estimate.- Unforeseen sub-surface conditions.- Restrictive technical specifications or excessive contract conditions.- Any specified item of material or product that cannot be obtained from 3 sources.- Any other non-competitive bid situations.- Bids delayed beyond the projected schedule.
Statement of Probable Cost	<p>Cumming has no control over the cost of labor and materials, the general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This estimate is made on the basis of the experience, qualifications, and best judgement of a professional consultant familiar with the construction industry. Cumming, however, cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent cost estimates.</p> <p>Cumming's staff of professional cost consultants has prepared this estimate in accordance with generally accepted principles and practices. This staff is available to discuss its contents with any interested party.</p> <p>Pricing reflects probable construction costs obtainable in the project locality on the target dates specified and is a determination of fair market value for the construction of this project. The estimate is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all sub and general contractors with a range of 3 - 4 bidders for all items of work. Experience and research indicates that a fewer number of bidders may result in higher bids. Conversely, an increased number of bidders may result in more competitive bid day responses.</p>
Recommendations	<p>Cumming recommends that the Owner and the Architect carefully review this entire document to ensure it reflects their design intent. Requests for modifications of any apparent errors or omissions to this document must be made to Cumming within ten days of receipt of this estimate. Otherwise, it will be assumed that its contents have been reviewed and accepted. If the project is over budget or there are unresolved budget issues, alternate systems / schemes should be evaluated before proceeding into further design phases.</p> <p>It is recommended that there are preparations of further cost estimates throughout design by Cumming to determine overall cost changes since the preparation of this preliminary estimate. These future estimates will have detailed breakdowns indicating materials by type, kind, and size, priced by their respective units of measure.</p>

SUMMARY			
Element	Area	Cost / SF	Total
Single Family Home	1,600	\$936.41	\$1,498,250
Linear 1B/1B Condo	750	\$704.87	\$528,650
Pinwheel 1B/1B Condo	750	\$643.27	\$482,450
Casita 1B/1B	750	\$844.20	\$633,150
RV Pad	2,000	\$108.20	\$216,400
Carport	800	\$825.00	\$80,000
Guest Amenity	2,000	\$825.00	\$1,650,000
Guest Room	350	\$715.00	\$250,250
Village Club House	2,500	\$830.00	\$2,075,000
Kitchen/Dining	4,000	\$1,100.00	\$4,400,000
Multi-Purpose Fitness Complex	10,000	\$850.00	\$8,500,000
Outdoor Fenced Sport Court	5,600	\$83.07	\$465,200
Pool with 200 SF Shade Structure	6,000	\$300.00	\$1,800,000

Village Product Typology Study

DETAIL ELEMENTS - VILLAGE PRODUCT TYPOLOGY STUDY

Element	Quantity	Unit	Unit Cost	Total
01 - Single Family Home	1,600	sf		
Base Building				
3bed/2bath incl. 2 car garage, 1,600SF each unit, single-story	1,600	sf	\$865.00	\$1,384,000
Exterior Improvements				
Covered patio	600	sf	\$80.00	\$48,000
Concrete driveway	600	sf	\$15.00	\$9,000
Concrete walkway	100	sf	\$15.00	\$1,500
Chain-link fence with privacy slats	250	lf	\$115.00	\$28,750
Utilities				
Wet Utilities				
Domestic water line, incl. trenching and backfill	50	lf	\$100.00	\$5,000
Sanitary sewer line, incl. trenching and backfill	50	lf	\$125.00	\$6,250
Storm drain line, incl. trenching and backfill	50	lf	\$135.00	\$6,750
Dry Utilities				
Electrical service and distribution	50	lf	\$180.00	\$9,000
Total - Single Family Home	1,600	sf	\$936.41	\$1,498,250
02 - Linear 1B/1B Condo	750	sf		
Base Building				
Linear 1bed/1bath condo, 750SF each unit, single-story	750	sf	\$625.00	\$468,750
Exterior Improvements				
Carport	200	sf	\$100.00	\$20,000
Covered patio	250	sf	\$80.00	\$20,000
Concrete walkway	250	sf	\$15.00	\$3,750
Chain-link fence with privacy slats	70	lf	\$115.00	\$8,050
Utilities				
Wet Utilities				
Domestic water line, incl. trenching and backfill	15	lf	\$100.00	\$1,500
Sanitary sewer line, incl. trenching and backfill	15	lf	\$125.00	\$1,875
Storm drain line, incl. trenching and backfill	15	lf	\$135.00	\$2,025
Dry Utilities				
Electrical service and distribution	15	lf	\$180.00	\$2,700
Total - Linear 1B/1B Condo	750	sf	\$704.87	\$528,650

DETAIL ELEMENTS - VILLAGE PRODUCT TYPOLOGY STUDY

Element	Quantity	Unit	Unit Cost	Total
03 - Pinwheel 1B/1B Condo	750	sf		
Base Building				
Pinwheel 1bed/1bath condo, 750SF each unit, single-story	750	sf	\$565.00	\$423,750
Exterior Improvements				
Carport	200	sf	\$100.00	\$20,000
Covered patio	250	sf	\$80.00	\$20,000
Concrete walkway	400	sf	\$15.00	\$6,000
Chain-link fence with privacy slats	40	lf	\$115.00	\$4,600
Utilities				
Wet Utilities				
Domestic water line, incl. trenching and backfill	15	lf	\$100.00	\$1,500
Sanitary sewer line, incl. trenching and backfill	15	lf	\$125.00	\$1,875
Storm drain line, incl. trenching and backfill	15	lf	\$135.00	\$2,025
Dry Utilities				
Electrical service and distribution	15	lf	\$180.00	\$2,700
Total - Pinwheel 1B/1B Condo	750	sf	\$643.27	\$482,450
04 - Casita 1B/1B	750	sf		
Base Building				
1bed/1bath condo, 750SF, single-story	750	sf	\$715.00	\$536,250
Exterior Improvements				
Carport	550	sf	\$100.00	\$55,000
Concrete walkway	250	sf	\$15.00	\$3,750
Chain-link fence with privacy slats	50	lf	\$115.00	\$5,750
Utilities				
Wet Utilities				
Domestic water line, incl. trenching and backfill	60	lf	\$100.00	\$6,000
Sanitary sewer line, incl. trenching and backfill	60	lf	\$125.00	\$7,500
Storm drain line, incl. trenching and backfill	60	lf	\$135.00	\$8,100
Dry Utilities				
Electrical service and distribution	60	lf	\$180.00	\$10,800
Total - Casita 1B/1B	750	sf	\$844.20	\$633,150

DETAIL ELEMENTS - VILLAGE PRODUCT TYPOLOGY STUDY				
Element	Quantity	Unit	Unit Cost	Total
05 - RV Pad	2,000	sf		
RV pad with full hookups	2,000	sf	\$20.00	\$40,000
Shade structure for RV and/or passenger vehicle, 16' tall	1,300	sf	\$100.00	\$130,000
Concrete driveway	550	sf	\$15.00	\$8,250
Chain-link fence with privacy slats	50	lf	\$115.00	\$5,750
Utilities				
Wet Utilities				
Domestic water line, incl. trenching and backfill	60	lf	\$100.00	\$6,000
Sanitary sewer line, incl. trenching and backfill	60	lf	\$125.00	\$7,500
Storm drain line, incl. trenching and backfill	60	lf	\$135.00	\$8,100
Dry Utilities				
Electrical service and distribution	60	lf	\$180.00	\$10,800
Total - RV Pad	2,000	sf	\$108.20	\$216,400
06 - Carport	800	sf		
Steel carport, 20' x 40', for 4 cars with asphalt paving	800	sf	\$100.00	\$80,000
Total - Carport	800	sf	\$100.00	\$80,000
07 - Guest Amenity	2,000	sf		
Guest amenities including kitchenette, laundry, linen, janitorial, utility, office, restrooms, small fitness room and a meeting room, single story	2,000	sf	\$825.00	\$1,650,000
Total - Guest Amenity	2,000	sf	\$825.00	\$1,650,000
08 - Guest Room	350	sf		
Guest room with 50SF covered patio including bathroom, closet and bedroom, excluding kitchenette, single story	350	sf	\$715.00	\$250,250
Total - Guest Room	350	sf	\$715.00	\$250,250
09 - Village Club House	2,500	sf		
Village club house including common room, fitness, janitor, mechanical and restrooms, single story	2,500	sf	\$830.00	\$2,075,000
Total - Village Club House	2,500	sf	\$830.00	\$2,075,000

DETAIL ELEMENTS - VILLAGE PRODUCT TYPOLOGY STUDY				
Element	Quantity	Unit	Unit Cost	Total
10 - Kitchen/Dining	4,000	sf		
Kitchen including dining, food prep, storage, freezer, server, chef's office, janitor and restrooms, single story	4,000	sf	\$1,100.00	\$4,400,000
Total - Kitchen/Dining	4,000	sf	\$1,100.00	\$4,400,000
11 - Multi-Purpose Fitness Complex	10,000	sf		
Multi-purpose fitness complex including multi use court, fitness room, community meeting rooms, lockers, restrooms, storage etc., single story	10,000	sf	\$850.00	\$8,500,000
Total - Multi-Purpose Fitness Complex	10,000	sf	\$850.00	\$8,500,000
12 - Outdoor Fenced Sport Court	5,600	sf		
Outdoor sports court (basketball / tennis / volleyball)	5,600	sf	\$50.00	\$280,000
Chain-link fence & gates, 12' H	312	lf	\$225.00	\$70,200
Shade structure	200	sf	\$125.00	\$25,000
Pole lighting	6	ea	\$15,000.00	\$90,000
Total - Outdoor Fenced Sport Court	5,600	sf	\$83.07	\$465,200
13 - Pool with 200 SF Shade Structure	6,000	sf		
Pool with 200SF shade structure	6,000	sf	\$300.00	\$1,800,000
Total - Pool with 20 SF Shade Structure	6,000	sf	\$300.00	\$1,800,000

MWD Village Improvements
RNT Architects

	4/30/2024				
	PHASE 1	PHASE 2	PHASE 3	PHASE 4	
Julian Hinds					
Site Prep	253,932	0	0	0	
Site Improvements	2,183,154	0	0	0	
Mechanical Utilities	70,860	0	0	0	
Electrical Utilities	44,400	0	0	0	
Survey	50,000	0	0	0	
Julian Hinds Village Total	2,602,346	0	0	0	
Eagle Mountain					
Site Prep	404,046	151,100	270,350	151,100	
Site Improvements	4,459,219	280,620	802,080	260,460	
Mechanical Utilities	270,930	69,000	258,000	69,000	
Electrical Utilities	333,340	45,840	106,000	45,840	
Survey	181,411	6,000	20,000	6,000	
Eagle Mountain Village Total	5,648,946	552,560	1,456,430	532,400	
Iron Mountain					
Site Prep	1,427,821	163,900	291,150	163,900	
Site Improvements	5,071,542	246,160	801,800	123,480	
Mechanical Utilities	238,730	60,300	229,200	30,150	
Electrical Utilities	229,780	38,400	87,400	19,200	
Survey	266,509	6,000	20,000	3,000	
Iron Mountain Village Total	7,234,382	514,760	1,429,550	339,730	
Gene					
Site Prep	1,383,701	204,225	295,050	167,800	
Site Improvements	2,417,704	435,525	801,800	241,960	
Mechanical Utilities	180,730	88,450	60,300	60,300	
Electrical Utilities	50,160	50,600	87,400	38,400	
Survey	50,000	8,000	20,000	6,000	
Gene Village Total	4,082,295	786,800	1,264,550	514,460	
Intake (incl Gene/Intake vacation rentals)					
Site Prep	145,450	0	0	0	
Site Improvements	208,570	0	0	0	
Mechanical Utilities	34,450	0	0	0	
Electrical Utilities	23,700	0	0	0	
Survey	5,000	0	0	0	
Intake Village Total	417,170	0	0	0	
Total (all villages)	19,985,139	1,854,120	4,150,530	1,386,590	
Escalation 4/22 - 4/24	1.0882	1.0882	1.0882	1.0882	
Grand total	21,747,279	2,017,602	4,516,493	1,508,849	
					TOTAL SITEWORK (2024 dollars)
					29,790,223



Engineering, Operations, & Technology Committee

Value Engineering Program Update

Item 6a

July 8, 2024

Item 6a

Value Engineering Program Update

Subject

Value Engineering Program Update

Purpose

Provide update on Metropolitan's Value Engineering Program

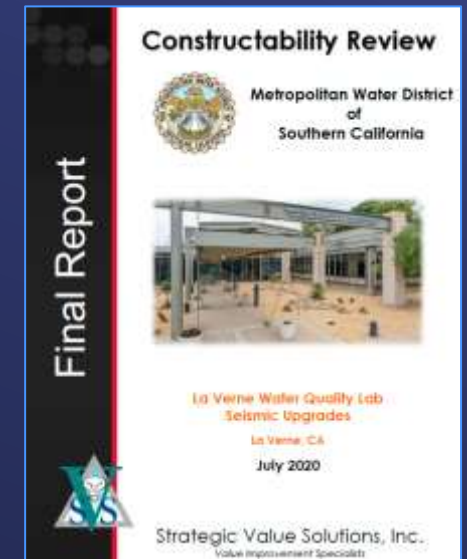
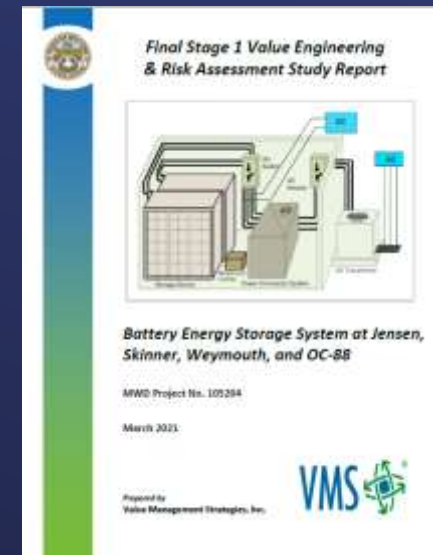
Next Steps

- Continue implementing Value Engineering Program
- Authorize on-call agreements for value engineering services in August 2024

Value Engineering Program Update

Presentation Outline

- Program Objectives
- Program Implementation
- Program Results
- Project Examples
- Next Steps



Value Engineering Program Objectives

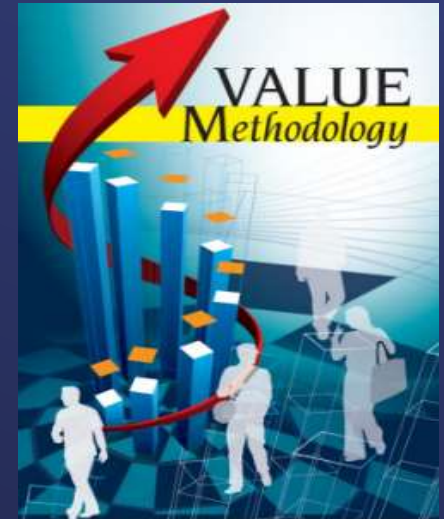
Metropolitan's Value Engineering Program

- 1994: Value Engineering (VE) program initiated
- Objectives
 - Improve the overall value of CIP projects
 - Enhance project performance, optimize use of funding for CIP projects
 - Demonstrate responsible use of public funds
- Types of Workshops
 - Value Engineering
 - Constructability Review (CR)
 - Risk Assessment
 - Specialized technical review
 - Partnering with stakeholders

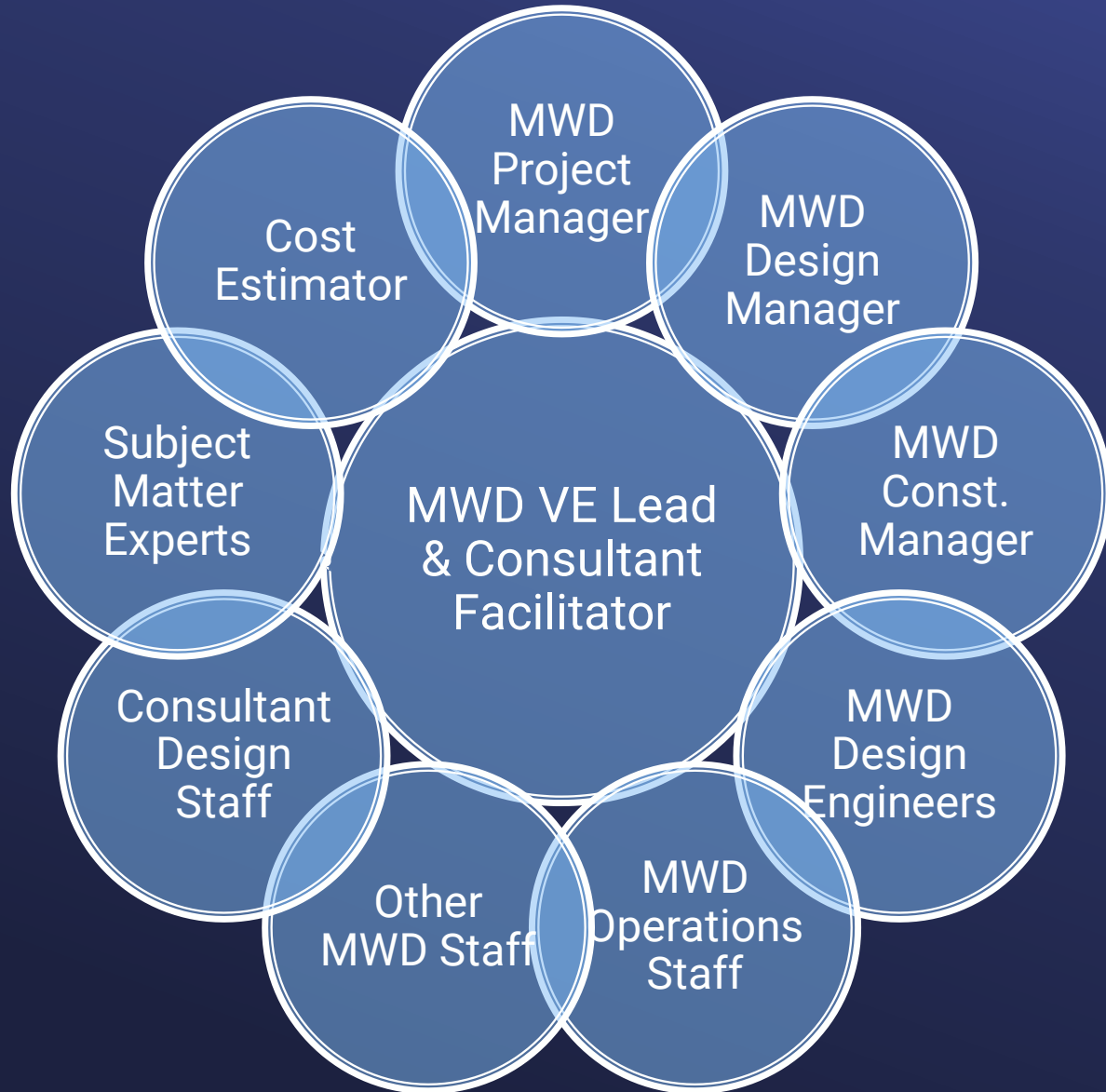
Value Engineering Program Workshop Process

Value Methodology

- Value Methodology initially developed in 1940's
- Purpose is to improve value by examining functions relative to costs
- Focus - Achieve required functions at the best possible capital and life cycle cost
 - Capital cost saving - not the primary objectives
 - Capital cost may be increased for other critical benefits



VE Team Composition



Diemer Filter & Chemical
Systems Rehab CR Workshop

On-Call Consultant Agreements

- Certified Value Specialists
- Independent Cost Estimators
- Subject Matter Experts

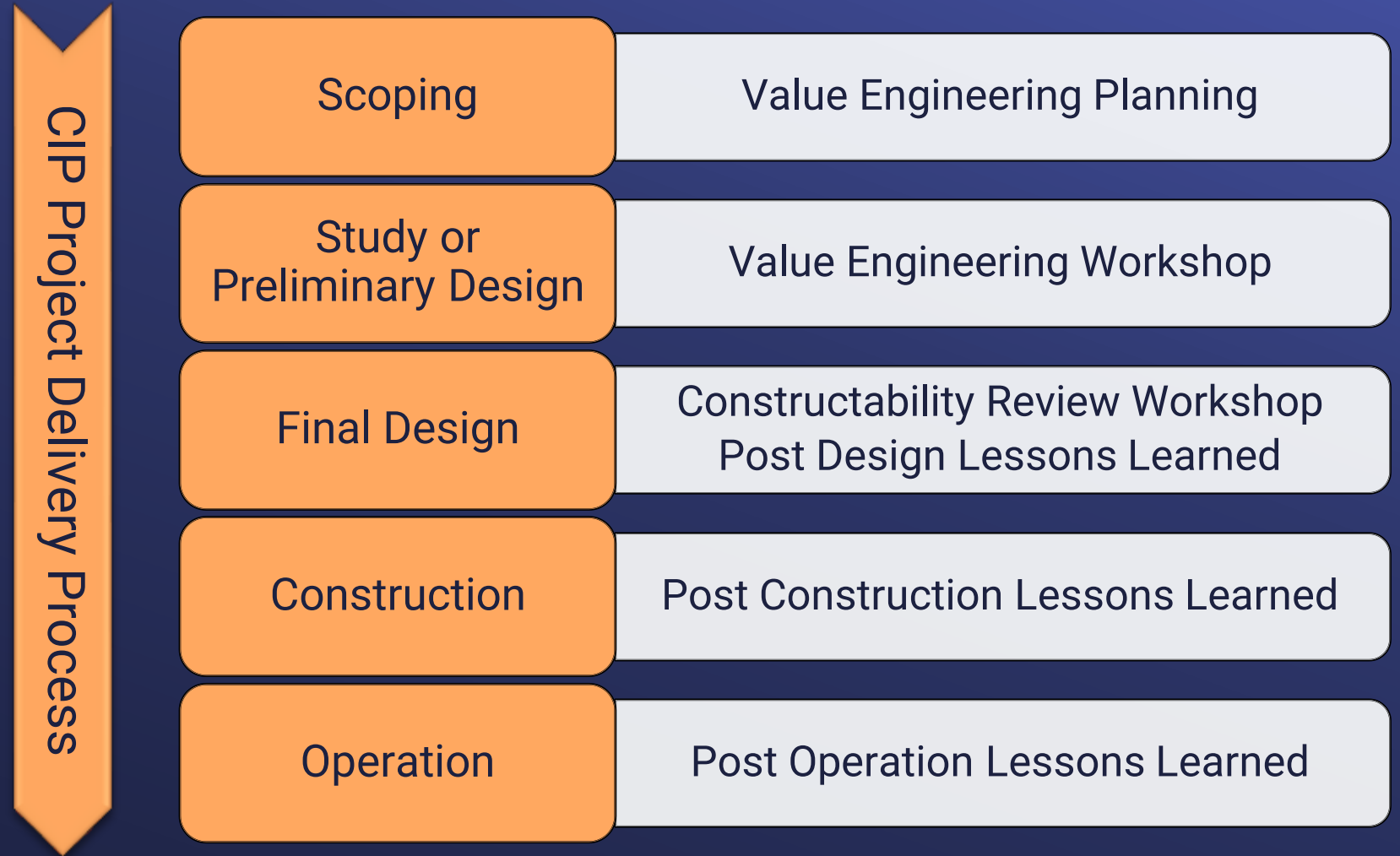
Value Engineering Program Project Selection

Project Selection

- Construction Cost Threshold
 - Projects in preliminary design with estimated construction cost > \$5M
 - Ensure that project will benefit from VE review
- Other projects may benefit from VE or CR
 - Complex projects involving many stakeholders
 - Work involving a shutdown & coordination with other member agencies
 - Projects involving underground work

Value Engineering & Lessons Learned

Value Engineering Program Implementation



Value
Engineering
Program
Results

VE Workshop Results – 1995 - 2024



Total estimated construction cost of projects studied

\$ 4.3 billion



Savings - accepted VE recommendations

\$ 215 million (approx. 5%)

Value Engineering Program CR Study Example

Copper Basin & Gene Wash Discharge Valve Rehab.

- CR Workshop conducted at Gene Pumping Plant in April 2016
- 20 participants
- 15 ideas generated, focused on construction risk
 - Construction access
 - Rockfall protection
 - Discharge isolation device



Review Team



Copper Basin Dam

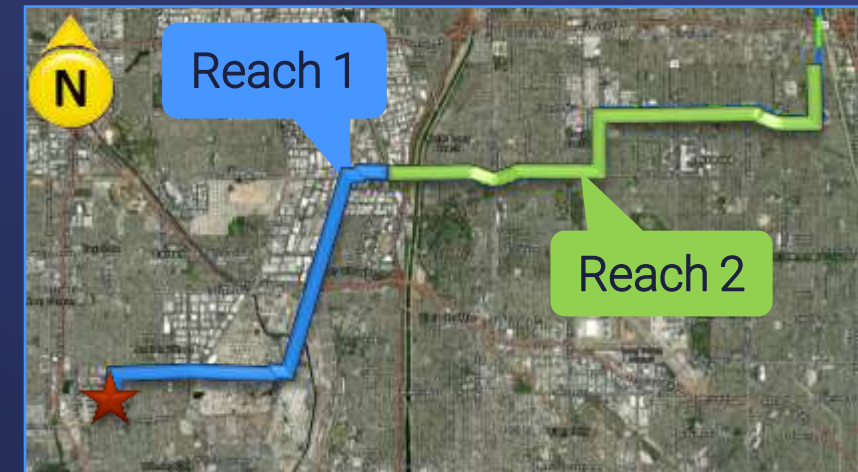
Value Engineering Program VE Study Example

Pure Water Conveyance Reaches 1 & 2

- VE Workshop conducted in May 2024
- 26 participants
- 91 ideas generated:
 - Flexibility for more tunneling
 - Curved tunnel segments
 - Vertical shaft design
 - Shop-applied pipe lining



Pure Water Conveyance
Reach 1 Utility Investigation



Pure Water Conveyance
Reaches 1 & 2 Alignment

Value Engineering Program

Next Steps

- Continue implementing Value Engineering Program
- Authorize on-call agreements for value engineering services in August 2024





Engineering, Operations, & Technology Committee

Update on Metropolitan Headquarters Construction

Item 6b

July 8, 2024

Item 6b

Update on Headquarters Building Construction

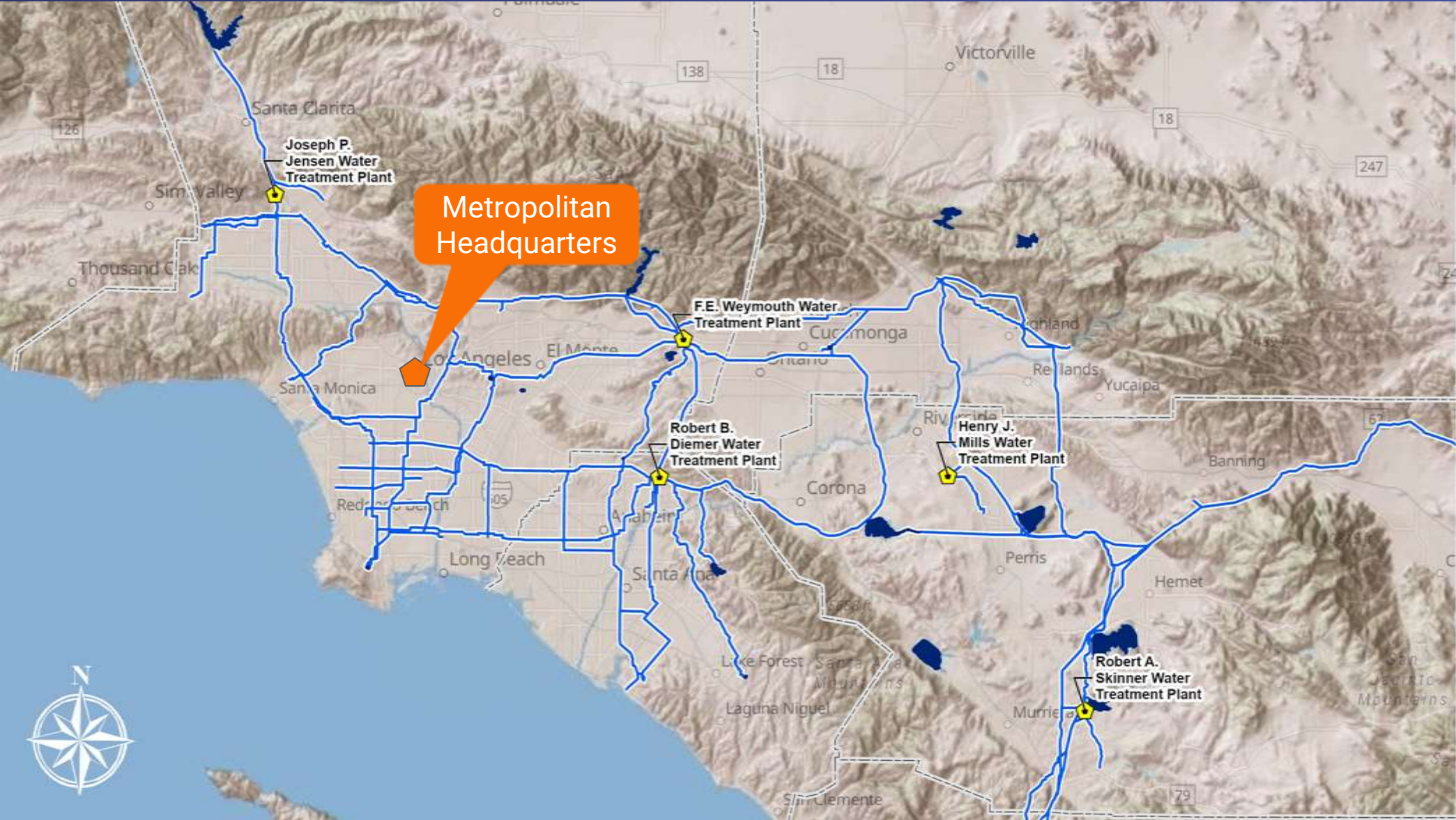
Subject

Update on Headquarters Building Construction

Purpose

Show current and upcoming improvements at
Metropolitan's Headquarters Building

Location Map



Headquarters Building Construction Background



Completed Projects

- Seismic Upgrades
 - Install Physical Security Windows/Doors
 - Walk-In Refrigeration System
- Upgrades in Board/Committee Rooms
- UVC Air Disinfection
- Physical Security Improvements, Stage 2
- Fire Sprinkler Replacement in Level P1
- Video Editing Room
- Courtyard Improvements

Seismic Upgrades

Completed
Projects
Seismic
Upgrades
Completed: 2023



Seismic Improvements

Exterior
Scaffolding



Interior Beam with Fiber Reinforced Polymer (FRP)



FRP wrapping
of Concrete
Beam

Initial Building Improvements

Completed
Projects
Initial Building
Improvements
Completed: 2023



Cafeteria Upgrades



Dining Area Upgrades

Technology Upgrades in Board & Committee Rooms

Completed
Projects
Upgrades in
Board &
Committee
Rooms
Completed: 2021



Boardroom Lighting Installation



Boardroom



Rotunda



Committee Room

Physical Security Upgrades

Completed
Projects
Physical
Security
Upgrades
Stage 1 & 2
Completed: 2022



Physical Security Stage 1



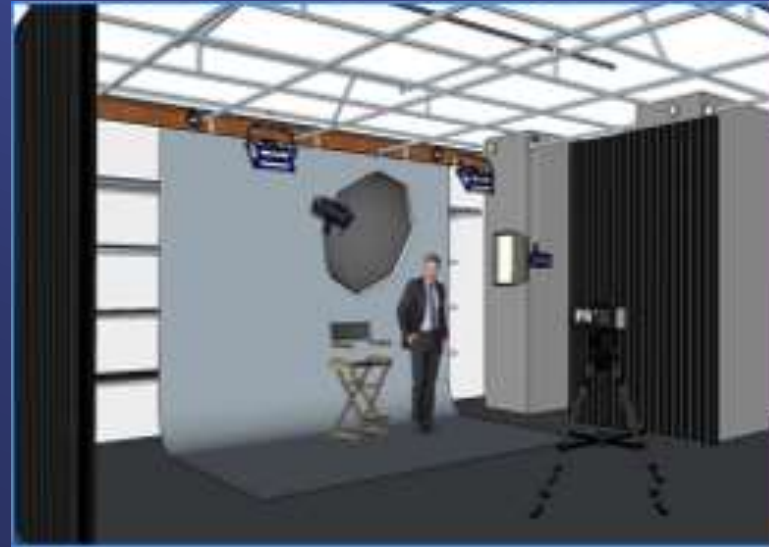
Physical Security Stage 2

Completed Projects

UVC Air
Disinfection
(Completed: 2022)



Video Editing
Room
(Completed: 2024)



Fire Sprinkler
Level P1
Replacement
(Completed: 2024)



Courtyard
Improvements
(Completed: 2024)



Headquarters Building Construction Background



Projects in Construction

Substantially Complete

- Fire Alarm & Smoke Control System Upgrades

Complete Soon

- Physical Security Improvements, Stage 3

Fire Alarm & Smoke Control System Upgrades

Fire Alarm & Smoke Control System Upgrades

Planned
Completion
August 2024



Supply Fan Testing



Configuring Smoke Control Zones



Testing New Fire Alarm System

Remaining Work: Witness Testing by Fire Department

Physical Security Improvements, Stage 3

Physical Security Improvements Stage 3

Planned Completion August 2024



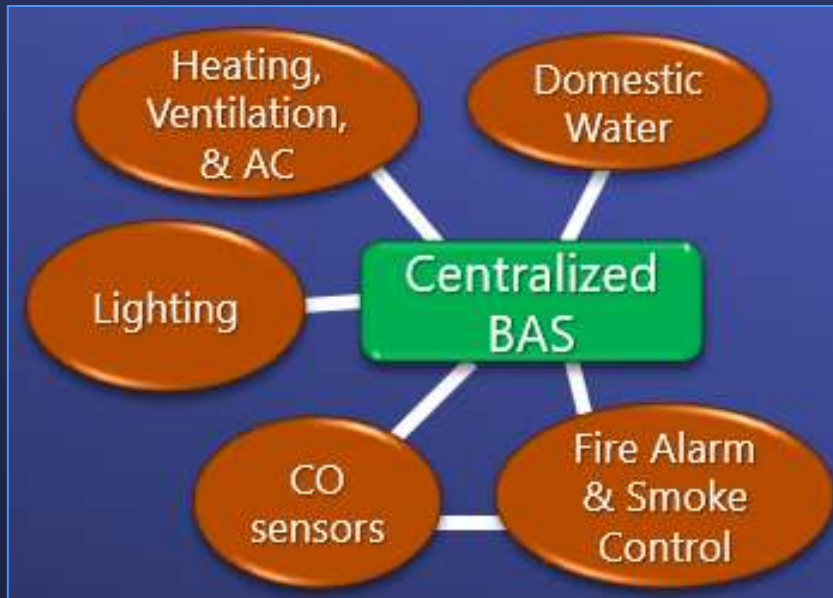
Installation of Bollards - 99% Complete



Installation of Fencing - 98% Complete

Future Board Actions

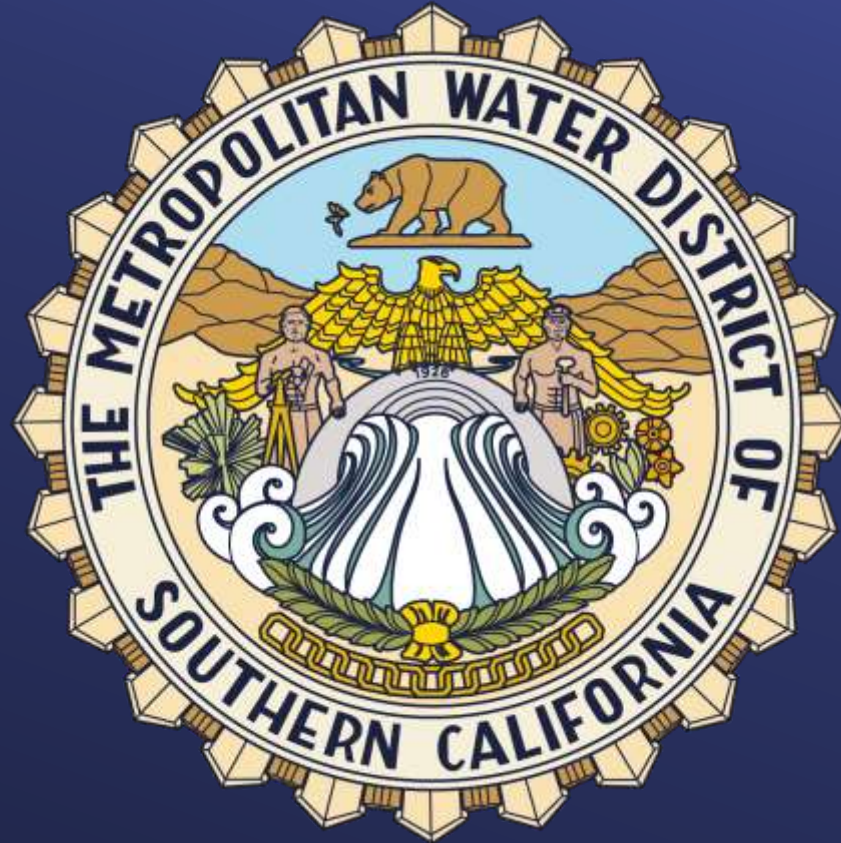
- HVAC & Chiller Plant Upgrades
- Building Automation System (BAS) Upgrades
- Lighting/Control System Upgrades
- Zero Emission Vehicle Infrastructure



BAS Upgrades



ZEV Infrastructure





Engineering, Operations & Technology
Committee

Introduction to AI

Item 6c
July 8, 2024

Item 6c

Introduction to AI

Subject

Introduction to AI

Purpose

This item provides an overview of the different types of Artificial Intelligence (AI) and the steps IT is taking to prepare for the adoption of AI tools.

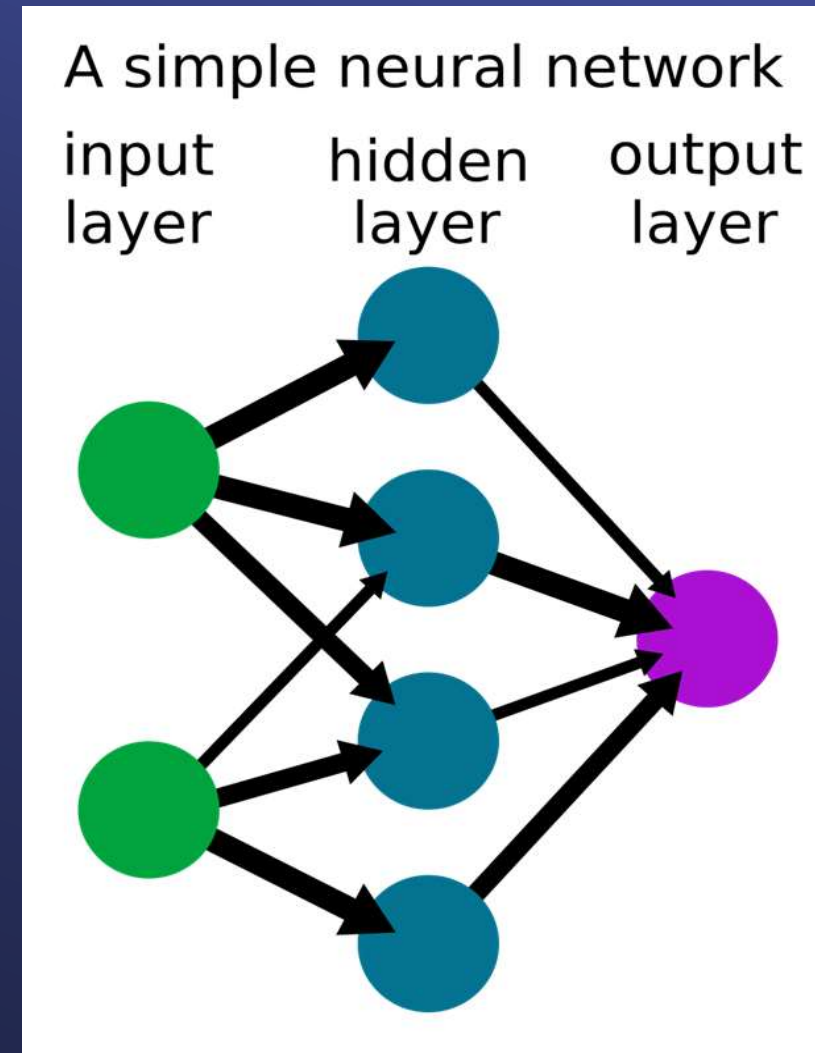
Agenda

In this presentation

- How AI Works
- Recent history of AI
- Governance and Risk
- Capabilities, and Opportunities at Metropolitan

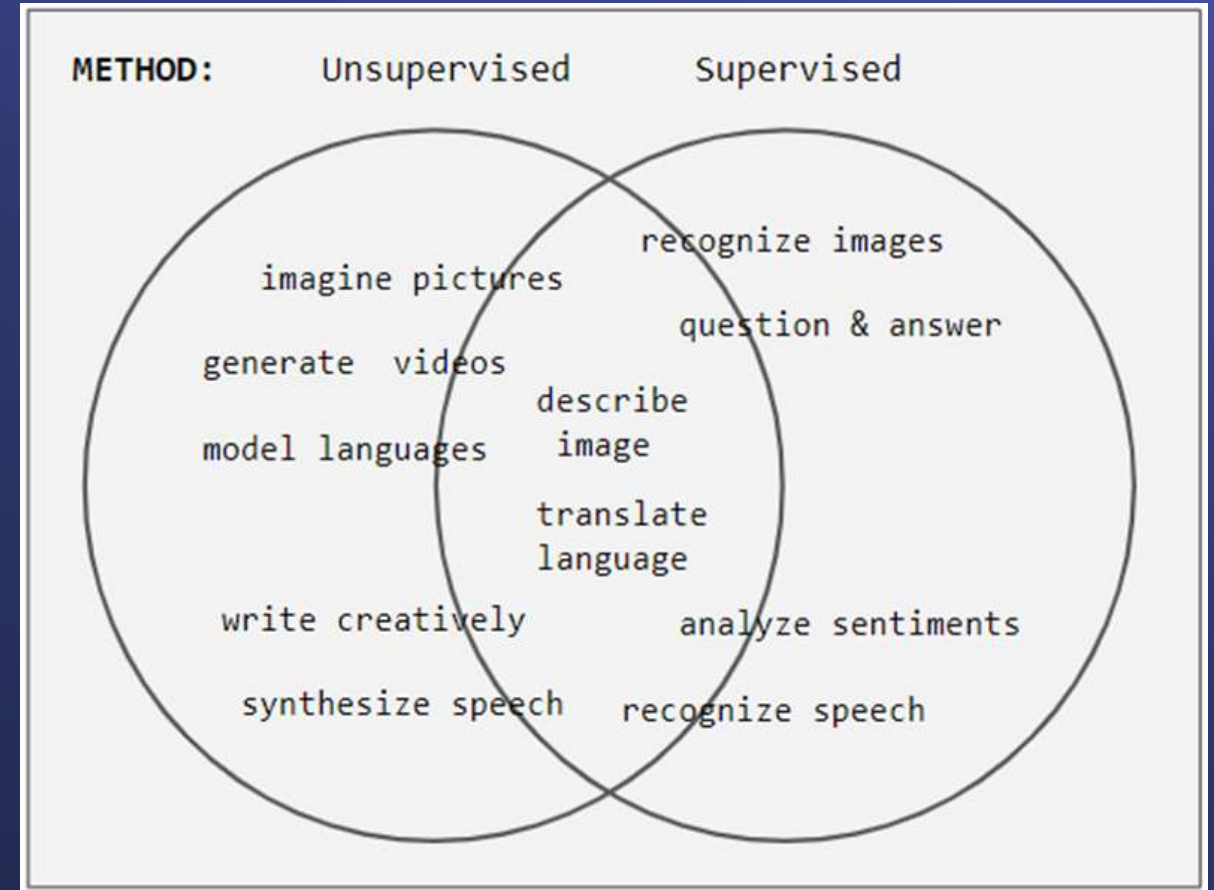
How AI Works

- Neural Network model inspired by the structure of animal brains
 - Artificial neurons are connected by “edges” which model a brain’s synapses
- Neuron receives signals from the connected neurons, and produces an output based on its activation function
- Neurons are aggregated into layers which each perform different transformations



How AI Works

- There are many methods for training artificial neural networks:
 - Supervised learning (spelling bee)
 - Reinforcement learning (rats with a cheese button)
 - Semi-supervised learning (example problems at beginning of an exam)
 - Unsupervised learning (finding patterns)



Recent History

- The term “Machine Learning” was coined in 1959 by Arthur Samuel of IBM
- Advances in the 90’s brought us data-driven Machine Learning
- Advances in the 2000’s and 2010’s brought us Deep Learning, which is capable of unsupervised learning
 - The term “deep” refers to the number of layers of nodes
 - “Unsupervised learning” means the AI can determine, without being told by a human, which attributes are most important to consider for an accurate outcome

Recent History

- Popular commercial applications of Machine Learning or Predictive AI in the past few decades include...
 - Siri, Roombas, Ring, and Fraud Detection



2022 GovX Project Experience Winner: MWD!



Recent History

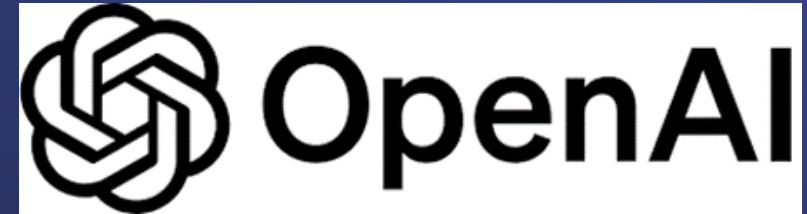
In 2014, the development of the generative adversarial network at the University of Montreal enabled deep neural networks to capture an aesthetic by using an opposing “generator” and “discriminator” to determine its own successes. This led to modern AI art generators.



Source: Bing image creator
Prompt: “an oil painting of the Hoover dam”

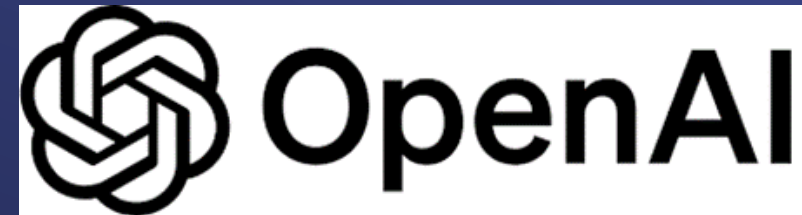
Recent History

- In November of 2022, OpenAI's ChatGPT was released for public testing, which was the first broad exposure to a Large Language Model (LLM).



A Word on ChatGPT and LLM Limitations

- It's designed to interface with humans.
 - Limits its usefulness in things like generating database queries without fine-tuning.
- Non-deterministic nature makes it feel more human but means results will not be consistent.
 - Consistency is crucial for integration with applications – computers can't understand English.



Governance and Risk

- Metropolitan published our GenAI Guidelines in March 2024.
 - Include a disclaimer when sharing AI-generated content.
 - Do not use sensitive data as an input to any AI tool.
 - Fact check all outputs.
 - Enterprise AI tools must be vetted by IT.
 - We are accountable for what AI creates at our direction.
 - Do not appropriate content for use in AI tools without permission, such as artwork.
 - Managers should understand the guidelines and assist staff accordingly.



Governance and Risk

- Data classification is required to safely deploy AI.
- The number one concern identified by a Gartner survey of over 600 technology leaders when asked about AI was about privacy of data.
 - Many AI tools “scrape” your enterprise data.
 - Improperly classified data can be unintentionally exposed by AI.
 - With the advent of “Action Models”, improper permissions and classifications may lead to AI taking actions that harm the enterprise.



Governance and Risk

- Fine tuned models.
 - Enterprise LLM solutions are typically priced by input/output volume.
 - Fine tuning provides control over the nature of responses the LLM provides.
 - Allows you to add unseen parameters to a user's input to steer the LLM generation toward a specific purpose.

```
1 {"messages": [{"role": "system", "content": "Marv is a factual chatbot that is also sarcastic."}]  
2 {"messages": [{"role": "system", "content": "Marv is a factual chatbot that is also sarcastic."}]  
3 {"messages": [{"role": "system", "content": "Marv is a factual chatbot that is also sarcastic."}]
```

What's Been Done to Date

- Many users throughout Metropolitan have evaluated ChatGPT and other GenAI models such as DALL-E for image creation.
- Metropolitan IT is working with Microsoft to perform an "AI Readiness" check based on our current infrastructure and data security posture.
- Machine learning has already been used successfully at Metropolitan for analytical work, cybersecurity, and performance monitoring tools.

Next Steps

- Implement new data classification tools through the Enterprise Content Management project.
- Continue testing of GenAI tools for code generation, database querying, and automating repeatable processes.
- Refining our standards around AI to ensure responsible and ethical use of the technology.
- Microsoft Office Copilot testing and deployment (draft documents, perform analysis, create presentations).
- Model transition from prompt engineering to leading questions.
- GenAI integration with other emerging technology domains, such as augmented reality and 3D printing.





Engineering, Operations & Technology Committee

Ensuring Compliance With Water Quality Regulations

Item 6d

July 8, 2024

Regulatory Compliance

Item 6d

Subject

Compliance with drinking water regulations

Purpose

Describe the regulations for monitoring drinking water and the actions, equipment, and people needed to ensure 100% compliance with those regulations

Next Steps

Adapt as necessary to changing environmental and regulatory landscapes to ensure continued compliance



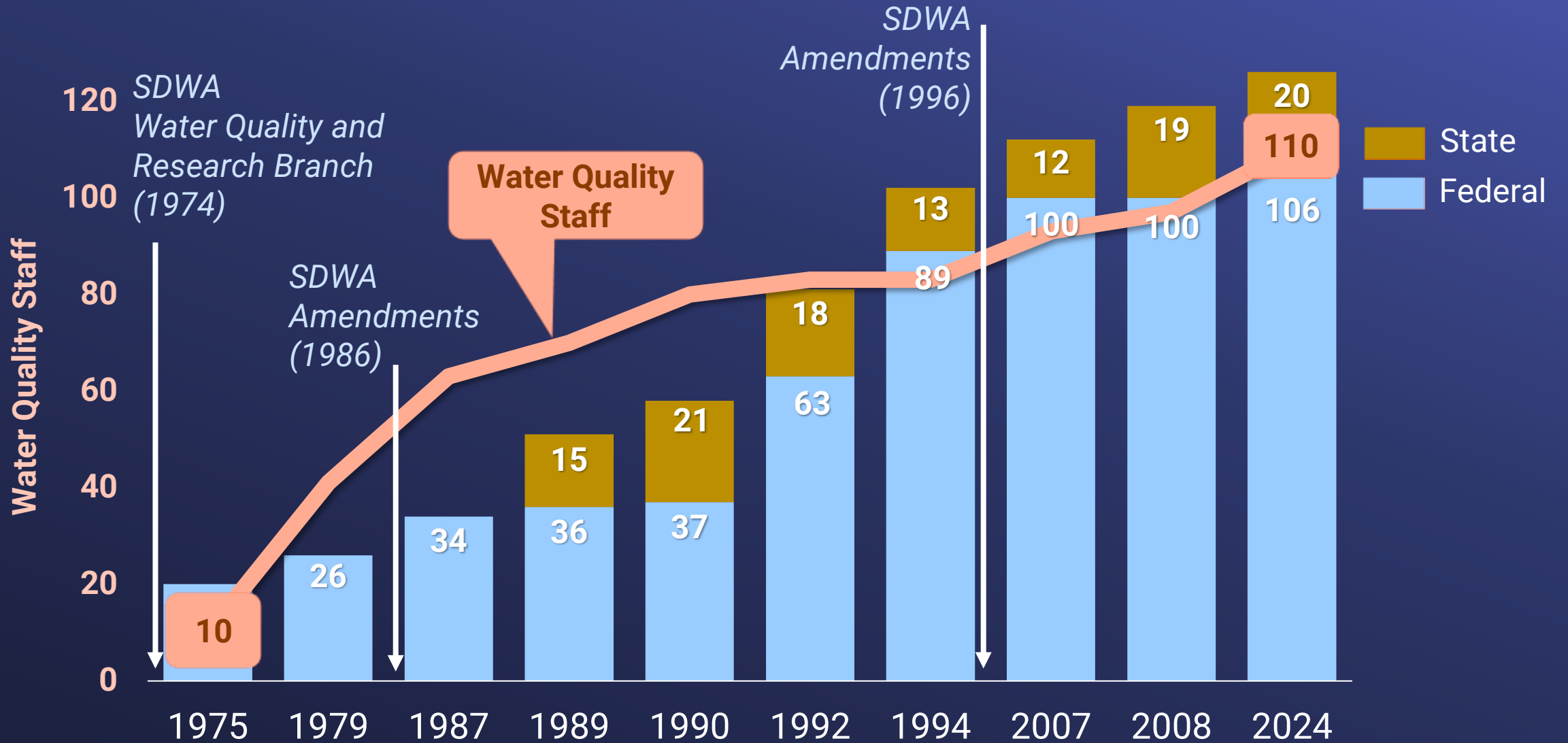
Water Quality Regulations





Federal and State Regulations

- Safe Drinking Water Act – 1974, 1986, 1996
 - Surface Water Treatment Rules
 - Interim Enhanced Surface Water Treatment Rule
 - Long Term 1 and 2 Enhanced Surface Water Treatment Rules
 - Stage 1 and 2 Disinfectants and Disinfection Byproducts Rules
 - Revised Total Coliform Rule
 - Consumer Confidence Report Rule
- Six-Year Review, Contaminant Candidate List
- Title 17 and Title 22 California Code of Regulations

Number of Regulated Drinking Water Constituents





Regulated Constituents



**Comprehensive Surface Water Treatment Rules
Quick Reference Guide: Systems Using Conventional or Direct Filtration**

Overview of the Rules	
Title	Surface Water Treatment Rule (SWTR) - 40 CFR 141.70-141.75 Interim Enhanced Surface Water Treatment Rule (IESWTR) - 40 CFR 141.170-141.175 Filter Backwash Recycling Rule (FBRR) - 40 CFR 141.76 Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) - 40 CFR 141.500-141.571
Purpose	Improve public health protection through the control of microbial contaminants, particularly viruses, <i>Giardia</i> , and <i>Cryptosporidium</i> .




Comprehensive Disinfectants and Disinfection Byproducts Rules (Stage 1 and Stage 2): Quick Reference Guide

Overview of the Rules	
Titles*	<ul style="list-style-type: none">▶ Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR) 63 FR 69390, December 16, 1998, Vol. 63, No. 241▶ Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR) 71 FR 388, January 4, 2006, Vol. 71, No. 2



**Revised Total Coliform Rule:
A Quick Reference Guide**

Overview of the Rule	
Title*	Revised Total Coliform Rule (RTCR) 78 FR 10269, February 13, 2013, Vol. 78, No. 30
Purpose	Increase public health protection through the reduction of potential pathways of entry for fecal contamination into distribution systems.



California Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

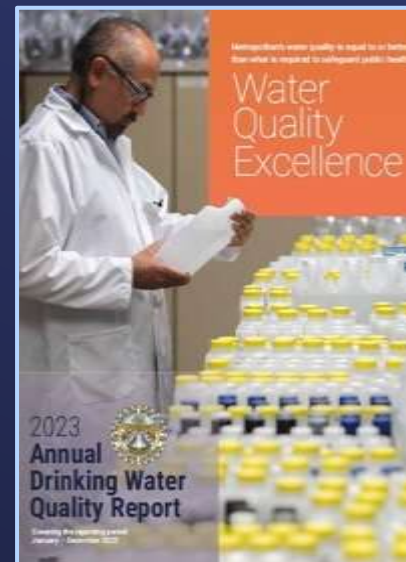
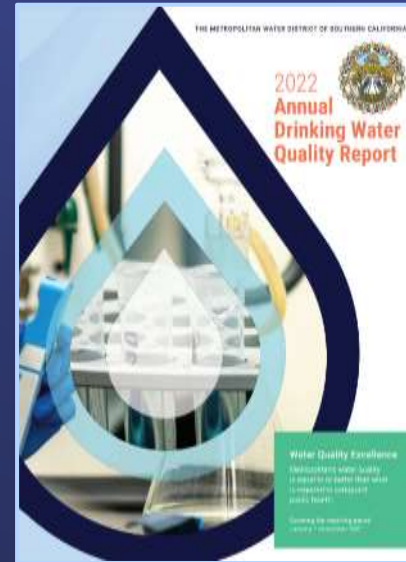
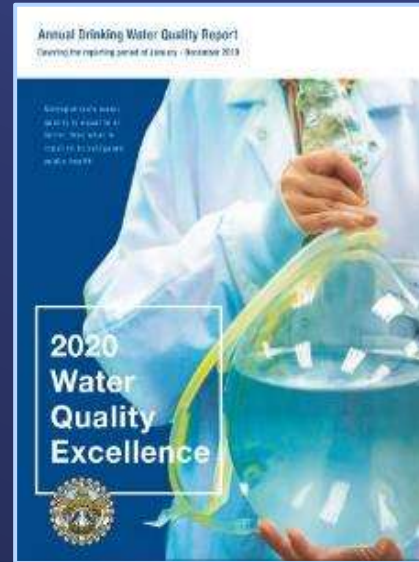
California Safe Drinking Water Laws
Selected Provisions of the Health & Safety Code and Water Code
(As amended, including Statutes 2023)

- Microorganisms
 - Coliforms, *Cryptosporidium*, *Giardia*, Viruses
- Disinfectants
- Disinfection Byproducts
 - Trihalomethanes, Haloacetic acids, Bromate
- Inorganic Chemicals
 - Metals, Minerals, Nitrate
- Volatile Organic Compounds
 - Benzene, Styrene, Vinyl chloride
- Synthetic Organic Compounds
 - 1,2,3-TCP, Dioxin, Glyphosate
- Radionuclides
 - Uranium, Radium, Gross Alpha & Beta

100% Compliance With Drinking Water Regulations

Water Quality's Mission

To safeguard the public's drinking water



- About 70,000 samples per year
- More than 400 constituents monitored
- Over 250,000 test results per year

Metropolitan's water quality meets or surpasses the standards required to safeguard public health

A Day in the Life of a Water Quality Sample



Monitoring plans



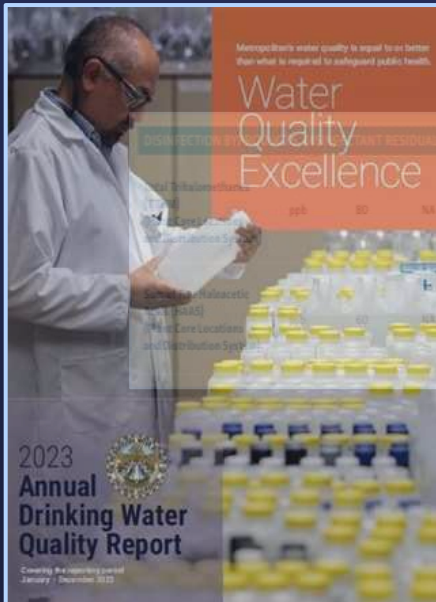
Sample collection



Sample receipt at lab

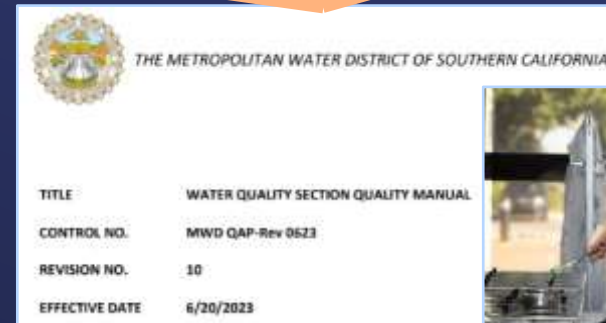


Analysis



Reporting

Range					
16 - 30	12 - 21	12 - 36	14 - 30	14 - 31	
Distribution Systemwide: 12 - 36					
24	17	25	23	27	
Distribution Systemwide: 28					
Range					
2.2 - 8.9	2.0 - 5.0	1.9 - 9.0	3.3 - 11	ND - 9.0	
Distribution Systemwide: ND - 23					
Highest LRAA	5.5	3.4	9.0	7.4	6.0
Distribution Systemwide: 9.0					



Quality assurance
and
Results review

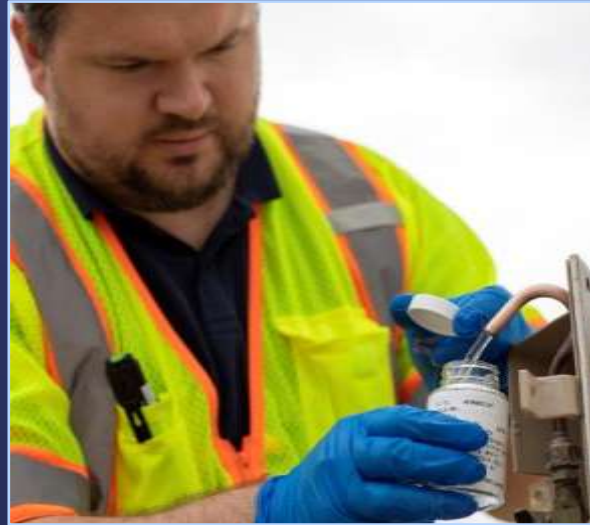


Collecting Daily Samples Across Our Vast Service Area

Compliance Monitoring



Maintenance on a source water monitoring platform



- 150,000 miles per year
- 70,000 samples in distribution system and at treatment plants
- Additional source water monitoring
- Over 100 sampling locations

Hundreds of Samples Received Every Week at Water Quality Laboratory

- Samples logged and checked on receipt
- Chain of custody, collection details
- Sample integrity, temperature, routing for required analyses
- Laboratory Information Management System

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
Water Quality Laboratory

Collection List - WQL

Scheduled Date: 5/14/2024
Not Collected On Scheduled Date: ☐
SDGN: 2024-02193
Route: WQ-27

Thermometer SN: 280154787

Site Location: LA-21
2024-02193-01-1 (T/COLLECT)(18) ✓

Comp	Allyout ID	Analysis Requested	TCN Smpl	# of Ally	Time Cell	DT °C	TCN mg/L	FCN mg/L	pH	FAC Field	Depth	Rec'd Status
			1241	18.4	2.21	N/A	3.45	3249				

Details: Member agency Sampling ☐

Notes: _____ ARRIVAL (Date/Time) _____

Order: Ambient = Room Temp C = Compliance NC = Not Collected NA = Not Applicable *FAC = Field analysis completion time, not to exceed 15 minutes from time of collection
OOS = Out of Service NF = No Flow IA = Inaccessible NJ = Not Detected CT = Corrected Time

EMP #	SIGNATURE	Date	Time	Temperature Upon Receipt (°C)	Total Aliquots: 1
Collected By	[Signature]	05/14/24	NA	Thermometer (SN): CF DT CT	Micro-Aliquots: 1
Relinquished By	[Signature]	05/14/24	1513	+16.7 ± 0.6 ± 7.0 ± 7.0	Receipt Status
Received By					<input type="checkbox"/> Scan <input checked="" type="checkbox"/> Manual
Relinquished By					<input type="checkbox"/> Not Rec'd <input checked="" type="checkbox"/> Previously Rec'd
WQL Received By	[Signature]	5/14/24	1515		



Logging samples upon arrival at the Water Quality Laboratory

Daily Monitoring of Bacteriological Water Quality



- Revised Total Coliform Rule
- Coliforms and *E. coli*
 - Evaluates treatment efficacy
 - Determines integrity of the distribution system
 - Indicates the possible presence of fecal contamination
- 74 compliance locations throughout distribution system
- Monitored 3-4 days per week
- Average monthly samples – 700

Coliform analysis using fluorescence technology and agar plates

Warning to boil drinking water in southwest UK after at least 22 cases of illness confirmed – May 2024

Testing for Pathogenic Protozoa in Drinking Water

- *Cryptosporidium* – resistant to chlorine
- *Giardia* – common cause of waterborne disease
- Potential surface water contaminants
- Monthly monitoring at treatment plant influents and effluents



Cryptosporidium and *Giardia* observed under fluorescence and light microscopy

Testing for Disinfection Byproducts (DBPs)

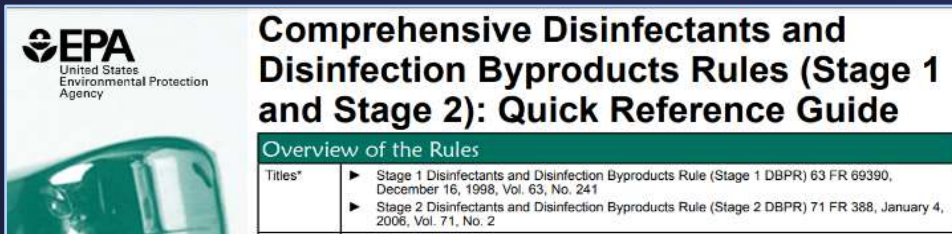
- 50 routine monitoring locations
- Weekly monitoring
- Chlorination DBPs
 - Trihalomethanes
 - Haloacetic acids
- Ozonation DBPs
 - Bromate
- DBP precursors
 - TOC and Bromide



Checking water samples



Reviewing sample results



Monitoring Over 100 Chemical Constituents

- Synthetic organic compounds
- Volatile organic compounds
- Metals and minerals
- Radiological materials



GENERAL MINERAL AND PHYSICAL ANALYSIS OF METROPOLITAN'S WATER SUPPLIES													
TABLE D													
April 2023													
CONSTITUENTS	UNITS	SOURCE WATERS							TREATMENT PLANT EFFLUENTS				
		LAKE HAVASU	SAN JACINTO TUNNEL	LAKE MATTHEWS	CASTAIC LAKE	SILVER WOOD LAKE	LAKE PERRIS	DIAMOND VALLEY LAKE	LAKE SKINNER	WEY-MOUTH	DIEMER	JENSEN	SKINNER MILLS
SILICA	mg/L	7.0	6.7	7.8	17.1	12.2	3.4	5.6	7.3	12.0	11.6	17.0	7.4
CALCIUM	mg/L	77	76	71	38	22	29	26	73	20	25	30	72
MAGNESIUM	mg/L	27	28	27	10	8	14	13	27	8	10	10	27
SODIUM	mg/L	100	101	95	57	38	63	54	98	39	47	68	103
POTASSIUM	mg/L	5.1	5.1	4.7	2.6	2.3	3.6	3.7	5.0	2.6	2.6	2.4	4.8
ALKALINITY, CARBONATE AS CO ₃	mg/L	0	1	0	0	0	0	0	2	0	1	0	0
ALKALINITY, BICARBONATE AS HCO ₃	mg/L	163	157	160	110	83	129	105	154	79	78	104	152
SULFATE	mg/L	233	237	219	87	44	45	49	229	51	70	112	236
CHLORIDE	mg/L	107	108	102	55	41	85	73	106	34	42	58	110
NITRATE	mg/L	2.0	1.7	0.9	4.6	3.2	0.4	0.5	1.1	3.5	3.3	4.6	1.2
FLUORIDE	mg/L	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.3	0.6	0.7	0.8	0.7
TOTAL DISSOLVED SOLIDS (TDS)	mg/L	640	643	608	327	212	308	277	626	210	252	364	638
TOTAL HARDNESS AS CaCO ₃	mg/L	311	307	290	136	89	129	118	296	81	99	138	291
TOTAL ALKALINITY AS CaCO ₃	mg/L	134	131	131	90	68	106	86	130	65	66	85	125
FREE CARBON DIOXIDE	mg/L	1.6	1.1	2.1	2.4	1.7	1.4	1.6	1.1	0.4	0.4	1.0	1.7
pH		8.22	8.38	8.11	7.89	7.91	8.18	8.04	8.38	8.55	8.51	8.24	8.17
SPECIFIC CONDUCTANCE	µS/cm	1050	1040	995	546	366	573	512	1020	357	424	604	1040
COLOR	CU	3	3	3	10	15	5	2	5	1	1	1	1
TURBIDITY	NTU	0.64	0.53	0.46	8.8	9.2	1.7	0.28	0.46	0.06	0.05	0.04	0.05
TEMPERATURE	°C	15	16	16	11	11	12	14	12	16	16	15	18
BROMIDE	mg/L	0.09	0.06	0.08	0.20	0.12	0.27	0.23	0.87	—	—	—	—
TOTAL ORGANIC CARBON	mg/L	2.90	2.95	2.76	2.80	4.70	4.82	2.60	3.08	—	—	—	—
SATURATION INDEX	—	—	—	—	—	—	—	—	—	0.21	0.25	0.15	0.52
STATE PROJECT WATER	%	0	0	0	100	100	100	100	6	100	94	100	7



Satellite Laboratories at Treatment Plants

Plant Operators and Chemists Ensure 24/7 Compliance

- Collect and analyze water samples to support treatment process and regulatory compliance monitoring
 - Samples every 2 hours
 - About 300 samples per day at each plant



Complying with New Stringent Laboratory Accreditation Standards

- Laboratory certification required under California drinking water regulations
- Annual data integrity and ethics training
- Annual Water Quality management review
- Laboratory procedures
 - Demonstration of capability
 - Standard operating procedures
 - Traceability of reagents and solutions
 - Equipment calibration and performance
 - Control tests and blank samples



Checking method performance and quality control samples

Regulatory Compliance Reporting and Engagement

- Monthly/quarterly/annual compliance reporting
 - SWRCB, Division of Drinking Water
 - County Environmental Offices
 - Large system and desert pumping plant domestic water systems
- Regulatory engagement
 - Provide input on regulatory development
 - Quarterly meetings with SWRCB's Division of Drinking Water

Metropolitan Water District of Southern California
Monthly Raw Water Coliform Report
Reporting Period: May 2024

DIEMER			JENSEN			MILLS		
Sample Date	Total Coliforms (MPN/100ml)	E. coli (MPN/100ml)	Sample Date	Total Coliforms (MPN/100ml)	E. coli (MPN/100ml)	Sample Date	Total Coliforms (MPN/100ml)	E. coli (MPN/100ml)
5/6/2024	214.3	<1	5/6/2024	86.0	1.0	5/6/2024	142.1	4.1
5/13/2024	3.1	<1	5/13/2024	42.2	<1	5/13/2024	24.6	<1
5/20/2024	1.0	<1	5/20/2024	13.1	<1	5/20/2024	30.5	1.0
5/28/2024	3.1	<1	5/28/2024	920.8	<1	5/28/2024	9.7	<1

Metropolitan Water District of Southern California
Monthly Distribution System Report
Metropolitan Water District of Southern California Reporting Period: May 2024

Distribution System Disinfectant Residuals (at Coliform Sample Site)

Calculation of "V", the percentage of distribution samples with a detectable disinfectant residual:

A) $\frac{702}{\text{Section 64664(c)(2)(A)}}$ The number of samples where the disinfectant residual was measured.

PATHOGEN MONITORING MONTHLY REPORT

Sample Sites	Sample Date	CRYPTOSPORIDIUM*	GIARDIA*
Treatment Plant Influent			
Diemer Plant Influent	05/06/2024	ND	ND
Jensen Plant Influent	05/14/2024	ND	ND
Mills Plant Influent	05/13/2024	ND	ND
Skinner Plant Influent	05/20/2024	ND	ND
Weymouth Plant Influent	05/07/2024	ND	ND

Monthly Compliance Reports

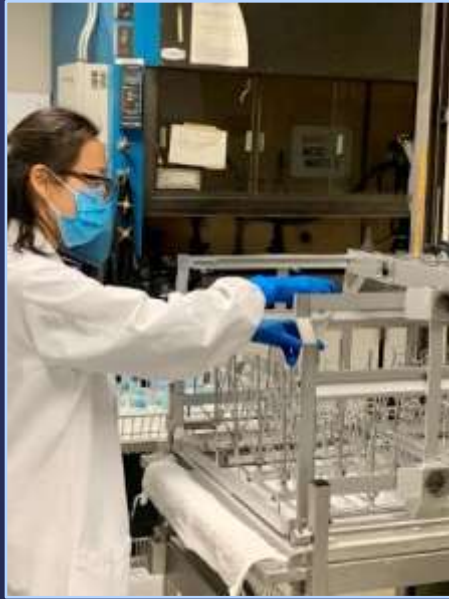
Annual Drinking Water Quality Report



B	C	D	F	G	H					I
					Treatment Plant Effluents and Distribution System					
Parameter	Units	State and Federal MCL	PHG	Range Average	Diemer Plant	Jensen Plant	Mills Plant	Skinner Plant	Weymouth Plant	Major Sources in Drinking Water
Percent State Water Project	%	NA	NA	Range Average	0 - 100 64	100	100	6 - 100 54	0 - 100 68	NA
PRIMARY STANDARDS - Mandatory Health-Related Standards										
CLARITY										
Combined Filter Effluent (CFE) Turbidity ^a	NTU %	TT	NA	Highest % ≤ 0.3	0.05 100	0.06 100	0.06 100	0.07 100	0.04 100	Soil runoff
MICROBIOLOGICAL ^b										
Total Coliform Bacteria ^c	% Positive Monthly Samples	5.0	MCLG = 0	Range Average	Distribution Systemwide: 0.0 - 0.2 Distribution Systemwide: 0.0					Naturally present in the environment
Heterotrophic Plate Count (HPC) Bacteria ^d	CFU/mL	TT	NA	Range Median	ND - 1 ND	ND - 64 ND	ND - 1 ND	ND - 1 ND	ND - 1 ND	Naturally present in the environment
ORGANIC CHEMICALS										
Toluene	ppb	150	150	Range Average	ND	ND	ND	ND	0.6	Discharge from petroleum and chemical refineries
INORGANIC CHEMICALS										
Aluminum ^e	ppb	1,000	600	Range Highest RAA	ND - 65 124	ND - 290 58	ND - 94 ND	ND - 94 51	ND - 110 122	Residue from water treatment process; runoff and leaching from natural deposits
Fluoride ^f	ppm	2.0	1	Range	0.1 - 0.9	0.4 - 0.8	0.1 - 0.9	0.3 - 0.8	0.6 - 0.9	Runoff and leaching from natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
				Average	Distribution Systemwide: 0.1 - 0.9 Distribution Systemwide: 0.7					
Nitrate (as Nitrogen)	ppm	10	10	Range Average	0.5	0.5	0.6	ND	0.5	Runoff and leaching from fertilizer use; septic tank and sewage; runoff and leaching from natural deposits
RADIONUCLIDES ^g										
Gross Alpha Particle Activity	pCi/L	15	MCLG = 0	Range Average	ND	ND - 3 ND	ND	ND - 4 ND	ND	Runoff/leaching from natural deposits
Gross Beta Particle Activity	pCi/L	50	MCLG = 0	Range Average	ND	ND	ND	ND - 5 ND	ND	Decay of natural and man-made deposits
Uranium	pCi/L	20	0.43	Range Average	ND	ND - 1 ND	ND	ND - 3 ND	ND	Runoff/leaching from natural deposits
DISINFECTION BYPRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BYPRODUCT PRECURSORS ^h										
Total Trihalomethanes (TTHM) (Plant Core Locations and Distribution System)	ppb	80	NA	Range	16 - 30	12 - 21	12 - 36	14 - 30	14 - 31	Byproduct of drinking water chlorination
				Highest LRAA	24	17	25	23	27	
					Distribution Systemwide: 28					
Sum of Five Haloacetic Acids (HAAS) (Plant Core Locations and Distribution System)	ppb	60	NA	Range	2.2 - 8.9	2.0 - 5.0	1.9 - 9.0	2.3 - 11	ND - 9.0	Byproduct of drinking water chlorination
				Highest LRAA	5.5	3.4	9.0	7.4	6.0	
					Distribution Systemwide: 9.0					

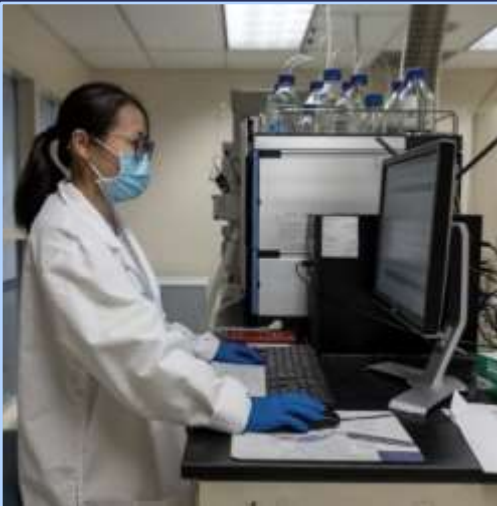


Behind the Scenes of 100% Compliance





Microplastics analysis



Cyanotoxin data analysis

Water Quality Challenges and Opportunities

- New regulated monitoring
 - PFAS, microplastics
- New contaminants, emerging DBPs
- Impacts of climate volatility
 - Turbidity, cyanotoxins
- Maintaining water quality in the distribution system
 - Variable demand and low flow
 - Nitrification
- New sources and treatment processes
 - Water reuse

Continued Compliance with Drinking Water Regulations

- Implement methods, upgrade equipment, and conduct research to prepare for new monitoring requirements
- Ensure new programs are compliance-ready
- Finalize design of upgraded Water Quality Laboratory
- Water industry engagement
 - Participate in technical advisory committees and workgroups
 - Provide input and feedback on regulatory development
 - Continue coordination with Member Agencies on water quality and regulatory compliance issues



Artist conceptual rendering of upgraded WQ Lab lobby



Member Agency workshop





Engineering Services Group

• **ESG Monthly Activities Report for June 2024**

Summary

This monthly report provides a summary of Engineering Services Group activities for June 2024 in the following key areas:

- Colorado River Aqueduct (CRA) Program
- Dams & Reservoirs Program
- Distribution System Program
- Information Technology and Control Systems Program
- Additional Facilities and Systems Program
- Prestressed Concrete Cylinder Pipe (PCCP) Program
- Water Treatment Plants Program
- Pure Water Southern California
- Drought Mitigation – State Water Project Dependent Areas
- Value Engineering Program
- Community Outreach
- Mentoring Programs

Purpose

Informational

Attachments

Attachment 1: Detailed Report - Engineering Services Group's Monthly Activities for June 2024

Engineering Services

Key Activities Report for June 2024

Engineering Services manages and executes projects within the Capital Investment Plan (CIP) to maintain infrastructure resiliency, ensure regulatory compliance, enhance sustainability, and provide flexibility in system operations to address uncertain water supply conditions. In addition, Engineering Services provides technical services to enhance reliable system operation and real property planning, valuation, acquisition, and disposition services to protect Metropolitan's assets. Engineering Services empowers our staff and partners with our business partners and the communities we serve to accomplish Metropolitan's mission.

Recent activities on CIP programs and other key engineering functions are described below.



Protect public health, the regional economy and
Metropolitan's assets

Colorado River Aqueduct (CRA) Program

The CRA program is composed of CIP projects to replace or refurbish facilities and components of the CRA system to reliably convey water from the Colorado River to Southern California.

- **CRA Storage Buildings**—This project furnishes and installs storage buildings at Hinds, Eagle Mountain, and Iron Mountain pump plants. The contractor has mobilized at all three pumping plants, and concrete placement for the building footings and slabs is underway at all three plants. Construction is 33 percent complete and is scheduled to be complete in April 2026.
- **Copper Basin Discharge**—This project installs a new 54-inch fixed cone valve and actuator at the base of the dam, refurbishes a slide gate and the existing valve house, and upgrades all associated electrical systems and access ladders at the Copper Basin Reservoir. This project will also include the replacement of the access ladders at the Gene Wash Dam. Final design is complete, and the acquisition of environmental permits necessary to advertise the project is in progress.
- **Eagle Mountain Utilities**—This project will replace the existing potable water, non-potable water, and sewer lines at the Eagle Mountain Pump Plant housing village. Final design is 90 percent complete and is scheduled to be complete in October 2024.
- **Hinds Discharge Valve Platform**—This project will replace corroded steel members, such as ladders and floor grates at all nine discharge valve pits at the Hinds Pumping Plant. Preliminary design is 90 percent complete and is scheduled to be complete in October 2024.



CRA Storage Buildings—Placing Concrete for Storage Building Slab at Eagle Mountain Pump Plant

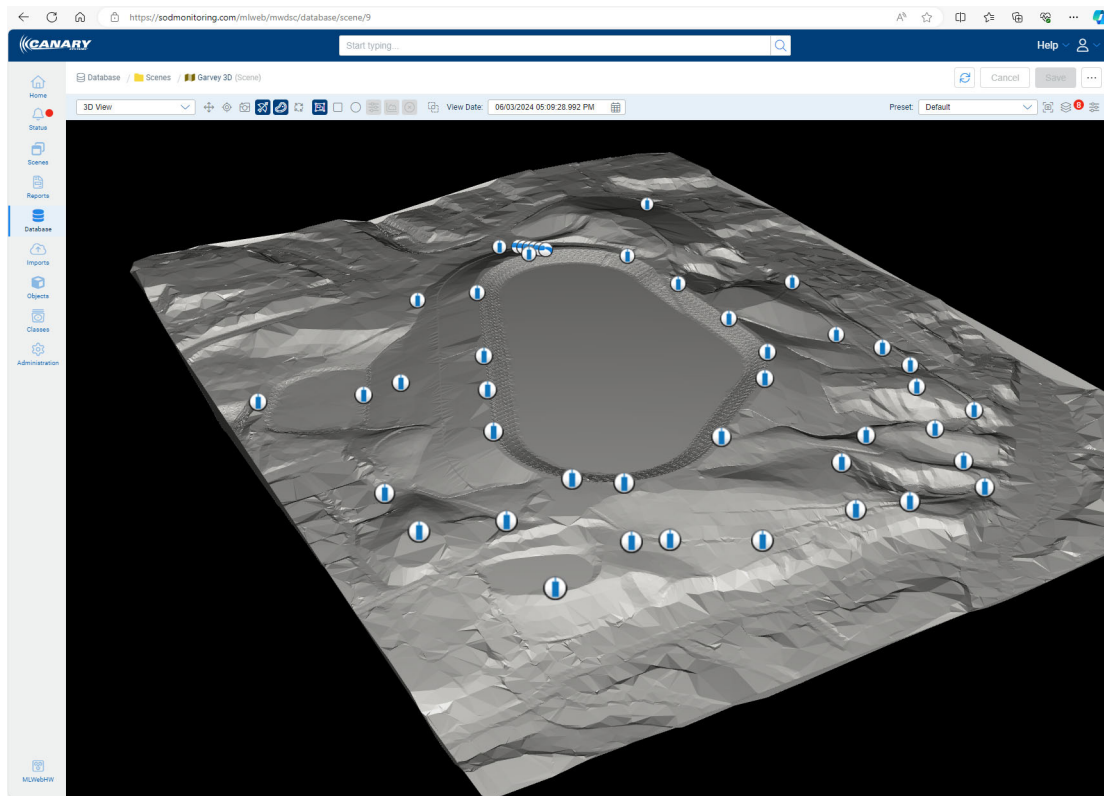
Dams & Reservoirs Program

The Dams & Reservoirs Program is composed of CIP projects to upgrade or refurbish Metropolitan’s dams, reservoirs, and appurtenant facilities to reliably meet water storage needs and regulatory compliance.

- **Garvey Reservoir Dam Monitoring System Upgrade Project**—This project was completed in June. New instrumentation was installed in 39 groundwater monitoring wells and three underdrain structures. A weather station and a seismic accelerograph were installed on the crest of the north embankment. The upgrade project also included a new automated data acquisition system and dashboard to allow for efficient monitoring of the performance of the reservoir liner and embankments.
- **City of Monterey Park**—Garvey Reservoir is located in the City of Monterey Park. In anticipation of upcoming projects at the reservoir site, Metropolitan staff provided a tour of the facilities to councilpersons from the City, along with city support staff.



New Automated Data Acquisition Equipment



Garvey Reservoir—New Monitoring System Dashboard



Bashar Sudah, Mai Hattar, Sam Mouawad and Lizeth Martinez with Monterey Park City Councilmembers and city staff at Garvey Reservoir

Distribution System Program

The Distribution System Program is composed of CIP projects to replace, upgrade, or refurbish existing facilities within Metropolitan's distribution system, including pressure control structures, hydroelectric power plants, and pipelines, to reliably meet water demands.

- **Foothill Hydroelectric Plant and Control Building Seismic Upgrade**—This project strengthens the Foothill Hydroelectric Plant and Control Building to withstand a major earthquake and retain its functionality as an essential facility. The contractor completed the structural strengthening of the roof and continued installation of shoring soldier piles around the building. Construction is approximately 65 percent complete and is scheduled to be complete in December 2024.
- **La Verne Shop Improvements**—This project will complete the La Verne Shops building improvements and install Metropolitan-furnished shop equipment. The contractor continued installing electrical conduits for branch circuits, began installing reinforcing steel for the new blast booth foundation, continued installing maintenance holes for the new electrical ductbank, began installing concrete formwork for the blast booth pit walls, and began installing new underground natural gas lines. Construction is approximately 91 percent complete and is scheduled to be complete in August 2024.
- **Service Connection OC-88 Chiller Replacement**—This project replaces deteriorated cooling equipment including three chillers and two chilled water pumps that provide cooling for the pump station's pump motors and air conditioning system. The contractor has installed and commissioned the first new chiller and has begun demolition of the existing second chiller. Construction is approximately 70 percent complete and is scheduled to be complete in November 2024.
- **Rialto Pipeline Rehabilitation**—This project replaces a 35-foot long, 121.5-inch diameter section of welded steel pipe on the Rialto Pipeline in the city of Upland, where the mortar lining has failed. This project also replaces the deteriorating pipe spool and isolation valve at the CB-11 service connection. Final design is complete, and a board award of a construction contract is scheduled for July 2024.

- **Perris Valley Pipeline**—This project will complete construction of the Perris Valley Pipeline and provide service connections to Eastern and Western Municipal Water Districts. This project installs 3,000 linear feet of tunnel that crosses the Interstate 215 freeway. The contractor has excavated all four shafts and completed construction of two of the three tunnel reaches. Construction of the last tunnel reach, which crosses I-215 and the railroad tracks, is scheduled to commence in early July 2024. Overall construction is 60 percent complete and is scheduled to be complete in early 2025.



Perris Valley Pipeline—Hole-through TBM at second shaft

Information Technology and Control Systems Program

The Information Technology and Control Systems Program is composed of projects to replace, upgrade, or provide new facilities, software applications, or technology that will enhance cyber security, reliability, flexibility, and capability of information, communication, and control systems.

- **SCADA System Upgrades**—This project will upgrade Metropolitan’s entire control system in incremental stages, spanning the Colorado River Aqueduct, the five water treatment plants, and the conveyance and distribution system. The first stage of this project replaces the control system at the Mills plant, starting with a pilot effort on one of the plant’s remote terminal units to demonstrate the proposed technology and the consultant’s approach to the plant and the overall project. Staff continued evaluating the results of the recently installed pilot equipment. The pilot phase is approximately 99 percent complete and is scheduled to be complete in July 2024. The system upgrades at the Mills plant are scheduled to be complete in October 2026.
- **Gene Communications Upgrade**—This project will construct a new fiber optic cable line from Parker Dam to Gene Pumping Plant. The new line is predominantly located within Metropolitan fee property on new power poles with a small underground portion of the alignment within the Bureau of Reclamation’s property. The contractor has forwarded contract submittals to support the upcoming construction work. Construction is approximately 7 percent complete and is scheduled to be complete in October 2024.

Additional Facilities and Systems Program

The Additional Facilities and Systems Program is composed of CIP projects to refurbish, replace, upgrade, or provide new facilities and systems that support Metropolitan’s business and district-wide operations.

- **Headquarters Physical Security Upgrades**—This project implements comprehensive security upgrades for the Metropolitan Headquarters Building. These upgrades are consistent with federally recommended best practices for government buildings. The work has been prioritized and staged to minimize rework and impacts on day-to-day operations within the building. Stage 1 work is complete and provides enhanced security related to perimeter windows and doors. Stage 2 work is complete and provides security system upgrades inside the building with a focus on the main entry rotunda area, boardroom, executive dining lounge, and security control room. Construction of Stage 3 improvements is underway and will provide security system upgrades around the perimeter of the building. The contractor continued installation of the ornamental fence around the courtyard and concrete placement for the fixed bollards. Construction is 85 percent complete and is scheduled to be complete in August 2024.
- **Headquarters Building Fire Alarm and Smoke Control System Upgrades**—This project upgrades the Metropolitan Headquarters Building fire life safety systems, which includes replacement of the fire detection and alarm system and HVAC system improvements for smoke control. The fire alarm and smoke control systems in Metropolitan’s Headquarters Building provide detection, notification, and control of building functions so that occupants and visitors can safely exit in the event of a fire. The contractor continued final testing and sign-off of the fire alarm and smoke control systems by the LAFD and Los Angeles Department of Building and Safety. Construction is 99 percent complete and will be deemed complete upon final certification by these agencies.

Prestressed Concrete Cylinder Pipe (PCCP) Program

The PCCP Program is composed of CIP projects to refurbish or upgrade Metropolitan's PCCP feeders to maintain water deliveries without unplanned shutdowns.

- **Allen-McColloch Pipeline Urgent PCCP Rehabilitation**—This project will perform urgent relining of approximately three miles of distressed PCCP segments of the Allen-McColloch Pipeline (AMP) that were discovered during an inspection in 2023. Relining of the AMP is being performed in stages to minimize impacts to member agencies by installing a bulkhead and returning the northern portion of the pipeline to service while the southern portion remains under construction. Stage 1 includes carbon fiber reinforced polymer (CFRP) lining of four segments and steel relining of approximately 4,500 feet of pipeline. Construction of the CFRP and 2,100 feet of steel liner within the northern portion of the AMP was successfully completed in April 2024. The remaining 2,300 feet of steel liner installation in the southern portion is underway and will be completed by October 2024. The Stage 1 excavation of the site is complete, and steel pipe delivery is in progress. Stage 1 is approximately 50 percent complete. Stage 2 work consists of 12,600 feet of steel liner installation and appurtenant work. The Board awarded the Stage 2 contract in May 2024, and construction is planned to be complete by December 2024.
- **Second Lower Feeder Valves**—This procurement contract provides 13 conical plug valves for the Second Lower Feeder PCCP rehabilitation. Metropolitan's Board awarded a procurement contract for the valves in December 2018. Ten valves have been delivered as of January 2024. The eleventh and twelfth valves are scheduled to be shipped in the Fall of 2024. Fabrication of the final valve will be completed in late 2024 and delivery is projected for early 2025.
- **Second Lower Feeder Reach 3B**—This project installs steel lining and three conical plug valves (described above) along a 3.7-mile-long portion of the Second Lower Feeder that traverses the cities of Lomita, Los Angeles, and Torrance. The contractor is currently preparing for a shutdown in winter 2024. Construction is 49 percent complete and is scheduled to be complete in September 2025.
- **Sepulveda Feeder Rehab Reach 1**—This project rehabilitates PCCP segments of the Sepulveda Feeder. Reach 1 of the Sepulveda Feeder spans 4.7 miles through several cities including the cities of Hawthorne, Inglewood, and Los Angeles. Final design is approximately 75 percent complete and is scheduled to be complete in June 2025.



Allen-McColloch Pipeline Urgent Relining—New pipe liner installation

Water Treatment Plants Program

The Water Treatment Plants Program is composed of CIP projects to replace or refurbish facilities and components at Metropolitan's five water treatment plants and the chlorine unloading facility to continue to reliably meet treated water demands.

- **Weymouth Basins 5–8 and Filter Building No. 2 Rehabilitation**—This project rehabilitates major mechanical and structural components of Basins 5–8 and Filter Building No. 2 at the Weymouth plant, including the flocculation/sedimentation equipment, sludge pumps, baffle boards and walls, launders, inlet gates, and outlet drop gates. Rehabilitation work also includes seismic upgrades of basin walls and inlet channel, hazardous material abatement, and replacement of filter valves and actuators in Filter Building No. 2. The contractor completed all rehabilitation work in Basins 7 and 8, and continued construction activities in Basins 5 and 6 and Filter Building No. 2. Overall construction for this contract is approximately 65 percent complete and is scheduled to be complete in July 2025.
- **Weymouth Administration Building Upgrades**—This project upgrades the Weymouth Administration Building to withstand a significant earthquake. The planned upgrades include structural strengthening consistent with current seismic standards for essential facilities as well as accessibility and fire/life safety improvements, architectural modifications near the areas of structural upgrades, and improvements associated with the preservation of historic architectural features. Final design is approximately 50 percent complete and is scheduled to be complete in April 2025.

- **Mills Electrical Upgrades**—This project upgrades the electrical system with dual-power feeds to key process equipment to comply with current codes and industry practice, improve plant reliability, and enhance worker safety. Stage 1 construction is complete. Stage 2 improvements will add a second incoming 12 kV service from Riverside Public Utilities, reconfigure the existing 4160-volt switchgear, and replace the standby generator switchgear and the emergency generator programmable logic controller. The contractor completed installation of the fiber optic cable and electrical conduit installation and began bench testing of the switchgear doors inside the ORP Switchgear Building. Construction is approximately 65 percent complete and is scheduled to be complete in August 2025.
- **Jensen Ozone PSUs Replacement**—This project rehabilitates the ozone generation system at the Jensen plant by replacing four existing ozone power supply units (PSUs) and four sets of generator dielectrics. The project also makes required modifications to the associated electrical, control, and cooling water systems. Replacement of the PSUs had been staged to ensure continuous use of ozone during construction. The contractor has completed the replacement of all PSUs and the ozone generator dielectrics. Performance testing is underway. Construction is currently 99 percent and is scheduled to be complete in July 2024.



Weymouth Basins 5-8 and Filter Building No. 2 Rehabilitation—Weymouth Basin 5 Bridge Demolition



Adapt to changing climate and water resources

Pure Water Southern California

The Pure Water Southern California (PWSC) Program is a large regional recycled water project that will provide a new local source of safe and reliable drinking water for Southern California. PWSC currently focuses in four areas: demonstration testing, environmental planning, technical studies, and preliminary design of initial pipeline reaches. PWSC will produce 150 million gallons per day (mgd) of purified water from the Advanced Water Purification Facility (AWPF) in Carson, for indirect potable reuse (IPR) and direct potable reuse (DPR) applications, with the initial deliveries by 2030 and completion by 2035.

- **Demonstration Testing:** Demonstration testing began in 2019 with N-only tertiary membrane bioreactor (tMBR) testing completed in 2021 and secondary MBR (sMBR) testing completed in 2023. Modifications for tMBR optimization testing have been completed. The system is online and currently operating in the nitrification/denitrification mode.
- **Environmental Planning:** The Environmental Planning Phase began in 2020 with the goal of preparing an Environmental Impact Report (EIR) for approval in 2025. Various technical studies have been prepared to support the effort. The draft EIR is currently scheduled for publication in late 2024 or early 2025, with board certification of the document in the third quarter of 2025. Staff continues to review individual draft technical sections and prepare the remaining technical studies.
- **Program Management:** PWSC program management efforts lead the planning for the Program, including project controls, scheduling, budget development, risk management, coordination with Program partners and stakeholders, grants and funding, and preparation of various plans and studies.
 - Metropolitan hosted a grant award ceremony at the Napolitano Innovation Center (NIC) in Carson on May 28, 2024, for recipients of the U.S. Bureau of Reclamation (USBR) Large-Scale Water Recycling grant (LSWR), where the USBR announced they intend to grant Metropolitan \$99,199,096 to advance the PWSC planning and design efforts. To receive funding, Metropolitan is required to contribute 75 percent in matching funds, or approximately \$300 million, a portion of which would be met with contributing funds from program partners including the Los Angeles County Sanitation Districts (LACSD). Staff plans to provide an update to the Board in August and return to the Board in September to amend the agreement with LACSD and request authorization to adopt a resolution to receive and match the USBR grant funding.
 - A second grant application to the LSWR program was prepared and submitted to the USBR in May for up to \$26 million dollars, or the difference between the initial grant request of \$125 million and the amount awarded.
 - Staff from Metropolitan's and LACSD's Pure Water Southern California team participated in a well-attended panel session at this week's AWWA Annual Conference and Exposition in Anaheim. The focus of the panel was the risks and challenges with implementing a large

recycled water program. Bruce Chalmers gave an overview of the Program, Derek Zondervan from LACSD highlighted LACSD's work on nitrogen management processes, Gloria Lai-Bluml described the treatment and conveyance facilities, Heather Collins gave a strong argument for implementing DPR, and Rupam Soni provided background on Metropolitan's extensive public outreach efforts. Kim Wilson moderated the panel and handled questions from the audience.

- The next PWSC/Regional Conveyance Subcommittee meeting will be in June 2024 and will include a Program update, grant status, and an agreement discussion.
- Project management efforts include continuing development of program governance and applicable program management information systems. Technical studies are being prepared for support of a direct potable reuse white paper, treated water augmentation at the Diemer Water Treatment Plant, how to address PFAS compounds in the EIR, and development of program phasing options.
- **Advanced Water Purification Facility:** The AWPf will purify wastewater from LACSD's A.K Warren Water Resource Facility (Warren Facility) using membrane bioreactors (MBRs), reverse osmosis (RO), and ultraviolet/advanced oxidation (UV/AOP).
 - A draft conceptual facilities plan has been prepared to document key assumptions of AWPf components. The final draft plan is currently being prepared.
 - The progressive design build alternative delivery methodology will be employed to design and construct the treatment plant facilities.
 - A proposed Request for Qualifications (RFQ) from qualified firms to design and construct the AWPf is scheduled for the third quarter of 2024. Authorization of this procurement is planned for late 2024, pending acceptance of federal grant funds.
 - Metropolitan has finalized the Method of Services (MOS) study agreements with Southern California Edison (SCE) for SCE to evaluate SCE infrastructure needed to meet AWPf power requirements. The MOS investigation is anticipated to be complete later this year.
- **Direct Potable Reuse (DPR):** The California Division of Drinking Water (DDW) published the final DPR regulations in December 2023. Metropolitan has completed bench-scale testing to screen the potential DPR treatment processes that could be used for the program. Planning of pilot-scale testing is in progress. A technical workshop was held with the Independent Scientific Advisory Panel (ISAP) on March 5 and 6, 2024, to discuss bench-scale testing data and proposed DPR treatment train. A DPR white paper has been developed to establish Metropolitan's DPR implementation approach via the PWSC Program. Potential opportunities for treated water augmentation (TWA) are also investigated, and a technical memorandum is being prepared.

- **Conveyance Pipeline System:** The program's backbone conveyance system consists of over 40 miles of pipeline and two pump stations. Metropolitan's Board authorized consulting agreements for preliminary design of the first two pipeline reaches in March 2023, and both projects are on schedule to complete preliminary design by end of the year. A value engineering workshop was conducted for the design of the first two pipeline reaches during the week of May 20, 2024, with an independent panel of subject matter experts in the areas of pipeline and tunneling design and/or construction, geotechnical engineering, construction cost estimating, and traffic control. The results of the study will be reviewed by the project team to ensure that each design is providing the most value to Metropolitan.
 - **Reach 1**—This reach is approximately 6 miles long and runs through the city of Carson. Current work includes utility field investigation and geotechnical work, as well as the completion of the draft preliminary design report and associate engineering drawings. Preliminary design is 75 percent complete and is scheduled to be complete by Fall 2024.
 - **Reach 2**—This reach is approximately 8 miles long and runs through the cities of Long Beach and Lakewood. Current work includes utility field investigation and geotechnical work, as well as coordination with Caltrans and other permitting entities for the major tunnel crossing of the I-710 and Los Angeles River. Preliminary design is 30 percent complete and is scheduled to be complete by late 2024.



Bureau of Reclamation Grant Funding Event—
Bureau of Reclamation Commissioner Camille Touton (center)



Pure Water Southern California AWWA ACE 2024 Conference Presentation Pane—
Kimberly Wilson, Rupam Soni, Gloria Lai-Bluml, Heather Collins, Bruce Chalmers, and Derek Zondervan
(LACSD) (left to right)

Drought Mitigation – State Water Project Dependent Areas

The Drought Mitigation—State Water Project (SWP) Dependent Areas Program is composed of CIP projects to replace, refurbish, upgrade, or construct new facilities, which are identified to mitigate the vulnerability experienced by specific member agencies that are affected during shortages of State Water Project supplies.

- **Furnishing Butterfly Valves for the Wadsworth Bypass Pipeline, Inland Feeder-Rialto Intertie, and Badlands Tunnel Surge Tanks**—This project furnishes three 84-inch diameter butterfly valves to improve the water supply reliability of the Rialto Pipeline. The fabrication of the three valves is complete, and they were shipped from the port of Osaka, Japan.
- **Sepulveda Feeder Pumping Stations, Stage 1**—This project installs new pump stations at the existing Venice and Sepulveda Canyon pressure control facilities, providing the ability to reverse flow in the Sepulveda Feeder and deliver 30 cubic feet per second from the Central Pool to portions of the Jensen plant-exclusive area. This project utilizes a progressive design-build (PDB) project delivery method. The Board awarded a Phase 1 PDB agreement in September 2023. The contractor and Metropolitan are coordinating with both Southern California Edison and the Los Angeles Department of Water and Power on upgrades to the incoming power service at both locations. Phase 1, which includes site investigation, design to the 70 percent level, environmental planning, and preparation of long-lead-item procurement documents, is scheduled to be complete in September 2024. Design work continues with the preliminary Basis of Design Report (BODR) being reviewed in June followed by the 30 percent design package review in July. A July board action is planned to amend the agreement for procurement of the transformers. A fall board action is planned for procurement of the remaining long-lead equipment.



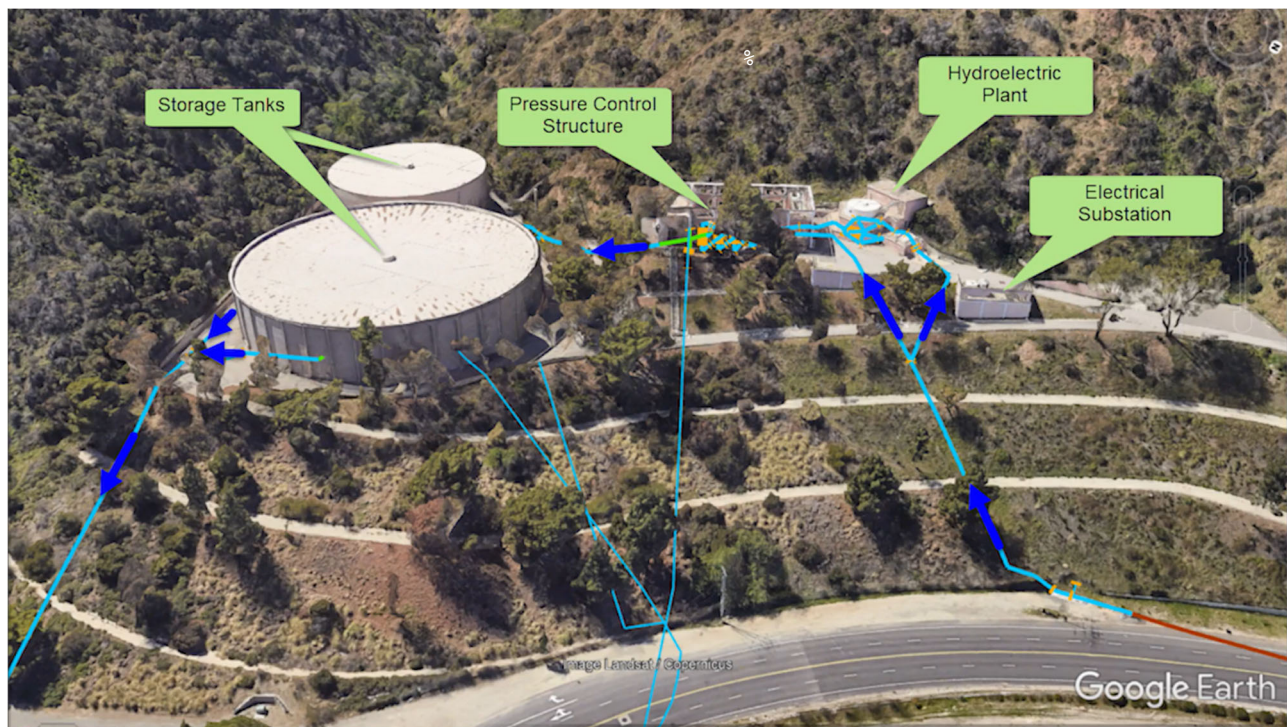
Sustain Metropolitan's mission with a strengthened business model

Value Engineering Program

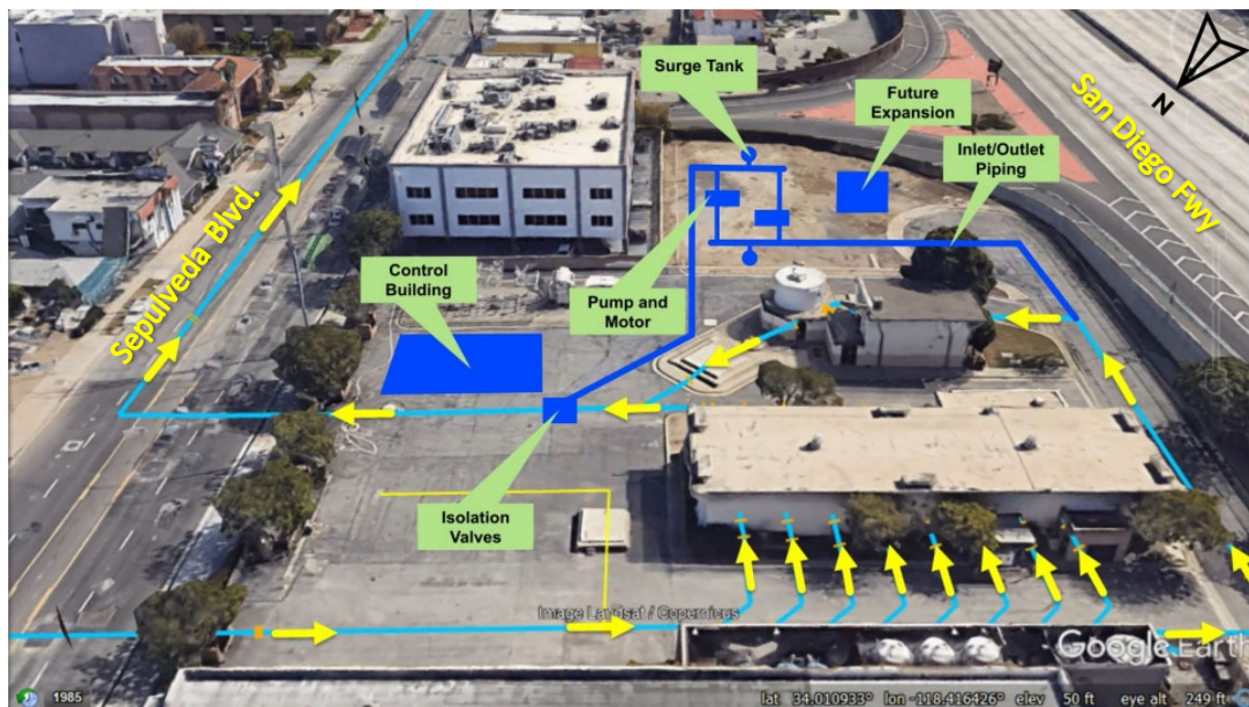
Engineering Services conducts a Value Engineering (VE) program to review capital projects and identify opportunities and alternatives to enhance project performance, optimize the use of funding for CIP projects, and demonstrate responsible use of public funds. The objective of the VE program is to improve the overall value of CIP projects by applying an industry-accepted assessment methodology to examine a project's function, design, equipment, material selections, and contracting approach. This comprehensive assessment is conducted at multiple stages in a project's life cycle.

Sepulveda Feeder Pump Stations—Value Engineering Workshop

A VE workshop for this project was completed in mid-June. The primary goal of the workshop was to develop a consensus on the selected design for the construction of pump stations at the Sepulveda Canyon and Venice Pressure Control Facilities. Once completed, this project will allow Metropolitan to deliver CRA supplies to the west service area during low SWP allocation periods. The four-day virtual workshop brought together Metropolitan staff and stakeholders, Metropolitan's progressive design build team, Value Engineering professionals, and consultant subject matter experts. The workshop focused on system hydraulics, project risks related to high-cost and long-lead items, O&M impacts, and options to expand pump station capacity in the future.



Sepulveda Canyon Pressure Control Structure Facility



Venice Pressure Control Structure Facility



Michael Thomas, Engineering Unit Manager, Presenting at IE Construction Network Event



Partner with interested parties and the communities we serve

Community Outreach

Engineering staff presented Metropolitan's upcoming contract opportunities and an update on Metropolitan's CIP at an Inland Empire construction networking event in Pomona, which was attended by contractors and design professionals. Eastern Municipal, Inland Empire Utilities Agency, and Western Water also presented their upcoming opportunities.

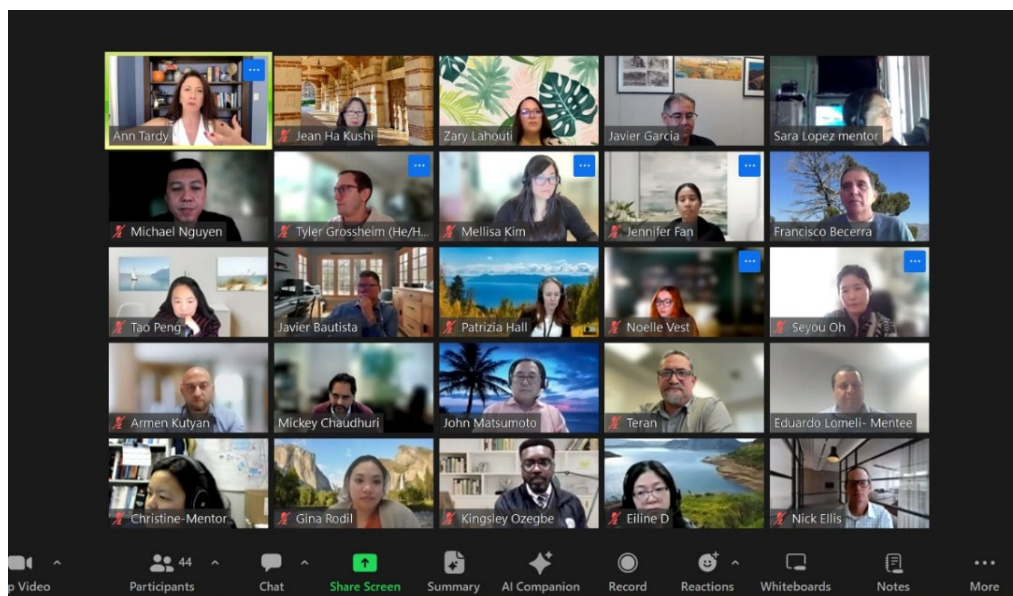


Empower the workforce and promote diversity, equity, and inclusion

Mentoring Programs

Engineering Services Mentoring Program—Flash Mentoring Event

The Engineering Services Mentoring Program held its 12th annual flash mentoring event in May. A cross-section of six Metropolitan Group and Section Managers—Francisco Becerra, John Bednarski, Mickey Chaudhuri, Liz Crosson, Mai Hattar, and Silvia Perez—participated in virtual speed mentoring sessions. There were approximately 50 participants consisting of mentees and mentors. The next mentoring module focuses on motivation and will include individual motivational assessments.



Engineering's Virtual Flash Mentoring Event

Engineering Management Mentoring Program

With nine individuals promoted to team manager this past year, Engineering launched a spinoff of its core mentoring program to focus on new engineering managers. The Engineering Management Mentoring Program seeks to provide increased support for these highly motivated leaders by helping these new managers navigate their new roles, optimally use resources to implement their goals, navigate the balance between leading people and performing technical work, and effectively lead and manage to achieve Engineering's and Metropolitan's mission. The mentees and mentors were matched to provide the new managers with an additional resource. A kickoff meeting and a subsequent module on HR transactions and the evaluation process were held. The next modules will include the Engineering Services Group's expectations, culture, and approaches to facilitating effective technical decision-making.



Engineering Management Mentoring Program Kickoff Meeting



Information Technology Group

• Information Technology Board Report June Update

Summary

This report provides a summary of activities related to the Information Technology Group for June 2024

Purpose

Informational

Attachments

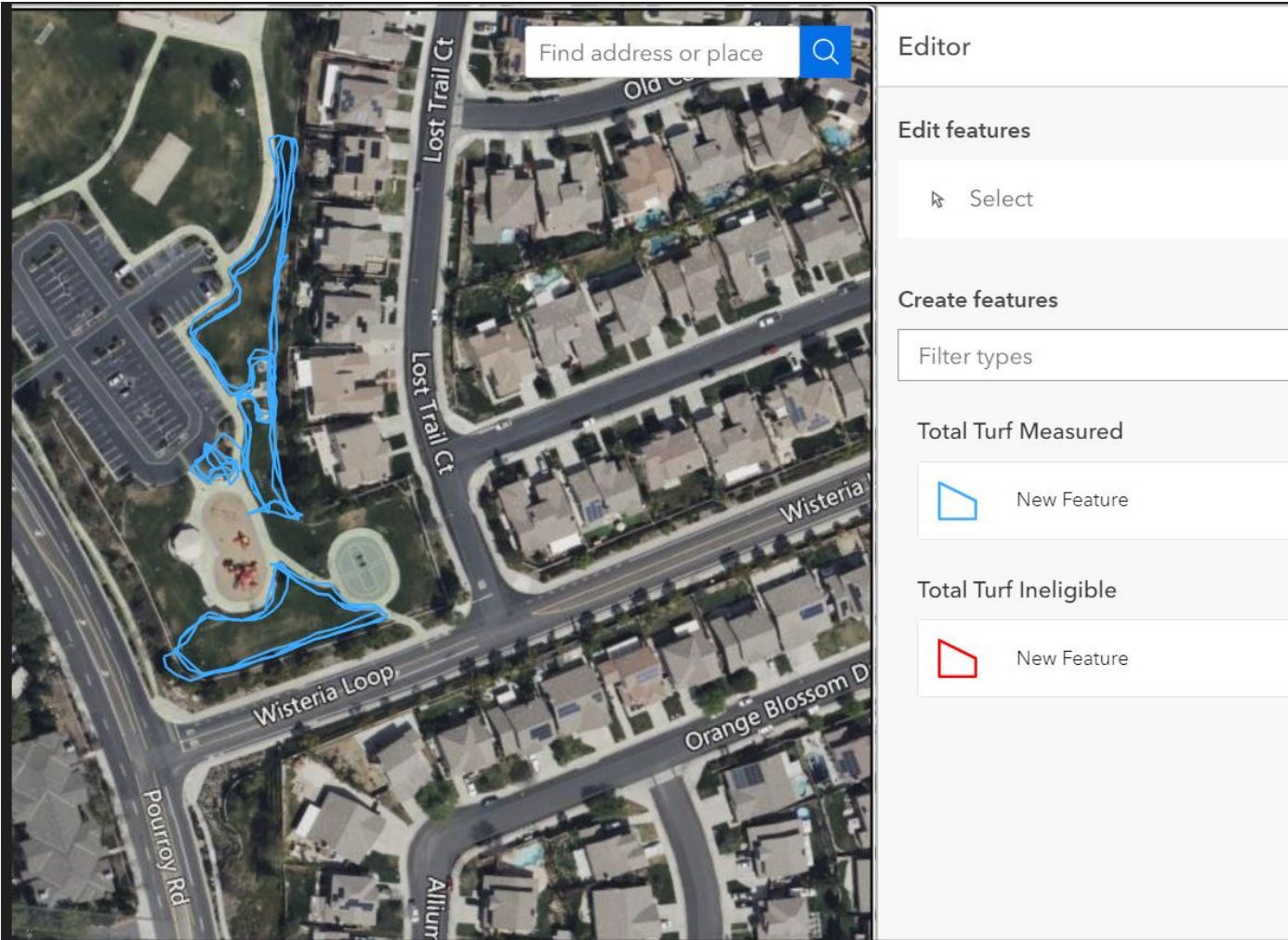
Attachment 1: Example of MWD's turf evaluation application.

Detailed Report

To boost water conservation efforts, Metropolitan has invested several hundred million dollars in the Turf Replacement Program. As part of the governance of this program, Metropolitan staff is performing spot checks of sites that have claimed a rebate for turf removal.

The ArcGIS application is built on top of the Information Technology group's enterprise Geographic Information System (GIS) platform. This platform allows GIS and the Water Resource Management staff to use mobile devices to easily collect spatial and tabular data on the various locations that have claimed this rebate to verify the efficacy of the program.

As a complete end-to-end solution, the mobile collection app feeds data into a desktop web mapping ArcGIS Experience application to visualize the surveys that have been taken to verify the turf rebates. The data is stored in a production enterprise geodatabase in PostgreSQL and will be used for regression analysis to determine changes in land use trends as we continually progress toward a more water-conscious Southern California.



Attachment 1: ArcGIS Field Maps allow users to draw a polygon around the study area to capture the eligible and ineligible turf. Additionally, users can stream as they walk the perimeter of the field, allowing the application to calculate the area.



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Board Report

Water System Operations Group

• Operations Monthly Activities for June 2024

Summary

This monthly report for the Water System Operations Group provides a summary of activities for June 2024 in the following key areas:

- Enhance Workforce Safety
- Ensure Accurate Billing and Support Revenue Generation
- Provide Reliable Water Deliveries and Manage Storage
- Develop New Supplies and Optimize System Flexibility
- Manage Power Resources and Energy Use in a Sustainable Manner
- Protect Source Waters and Ensure Water Quality Compliance
- Optimize Water Treatment and Distribution
- Protect Infrastructure and Optimize Maintenance
- Optimize Asset and Maintenance Management
- Prepare for Future Legislation and Regulations
- Advance Education and Outreach Initiatives
- Engage with Member Agencies and Other Stakeholders on Technical Matters

Purpose

Informational by the Water System Operations Group on a summary of key activities for the month of June 2024

Attachments

Attachment 1: Detailed Report – Water System Operations Group’s Monthly Activities for June 2024

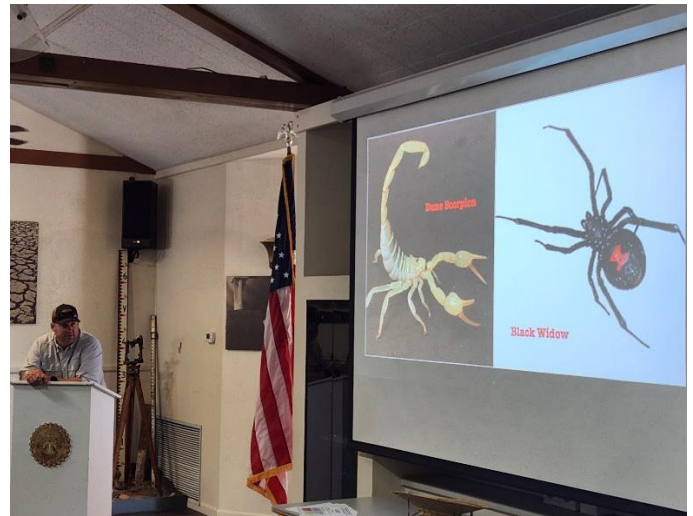
Operations

Water System Operations

Core Business Objectives

Enhance Workforce Safety

The Desert section held an all-hands employee safety event at the Gene Camp facility. This event featured speakers and presentations from the Safety Committee, SRT, Security, Environmental, Employee Relations, and Desert management. Demonstrations of new tools and warehouse items were available for review, and the teams were able to spend time collaborating across disciplines in a relaxed, safety-focused environment.



Staff participated in the June Safety Month Event at Gene Camp

Ensure Accurate Billing and Support Revenue Generation

Operations staff is working with Finance, Information Technology, and a consultant team to develop the WINS 2.0 application that will eventually replace the current application for invoicing member agencies' monthly water transactions. Staff has been testing the Automatic Meter Reading and Meter Maintenance modules and has been working with the project group to review various components. This month, workshops began for the new Water Programs module. The Water Programs module, along with the application's Rules Engine, will allow for an efficient setup and invoicing of water delivered under Metropolitan's various water programs.

Provide Reliable Water Deliveries and Manage Storage

Metropolitan member agency water deliveries were 101,600 acre-feet (AF) for June with an average of 3,400 AF per day, which was about 300 AF per day higher than in May. Metropolitan continued delivering water to the Cyclic and Conjunctive Use Programs. Treated water deliveries were 6,300 AF higher than in May for a total of 58,500 AF, or 58 percent of total deliveries for the month. The Colorado River Aqueduct (CRA) pumped a total of 96,000 AF in June. State Water Project (SWP) imports averaged 2,000 AF per day, totaling about 60,000 AF for the month. The target SWP blend is 25 percent for Weymouth, Diemer, and Skinner plants.

Metropolitan expects to have sufficient SWP and Colorado River supplies to meet demands in 2024. Water continues to be managed according to Water Surplus and Drought Management (WSDM) principles and operational objectives with an emphasis to position SWP supplies to meet future demands in the SWP-dependent area. Metropolitan has resumed deliveries to Desert Water Agency and Coachella Valley Water District because of the improved supply conditions. Metropolitan is continuing to minimize the use of Table A supplies this year to improve SWP carryover for next year.

Develop New Supplies and Optimize System Flexibility

During June, staff continued baseline monitoring for tertiary membrane bioreactor (MBR) nitrification-denitrification testing at the Pure Water Southern California Napolitano Innovation Center (NIC) demonstration plant and maintained stable MBR and reverse osmosis (RO) process performance at target operating conditions. The carbon dosing system was optimized to achieve MBR filtrate nitrate targets. Comprehensive monitoring at multiple process locations was completed to characterize performance of the treatment train. Metropolitan's SCADA personnel enhanced the plant's control system to enable automatic flow variation, aiming for a more precise simulation of full-scale operations while initiating stress tests on the bioreactors.



Electrical panel maintenance (left) and preparing ultrafilters for microbial sampling of the MBRs (right) at the NIC demonstration facility

Manage Power Resources and Energy Use in a Sustainable Manner

Energy markets in June trended upward because of the onset of summer weather but still reflect relatively plentiful natural gas supplies. Natural gas prices remained in the \$2–5 per Metric Million British Thermal Unit (MMBtu) range. Renewable generation remained strong; however, increasing load caused overall electric power prices to increase, resulting in fewer hours with negative electricity prices. Careful scheduling of CRA load and Metropolitan’s USBR generation allocations at Hoover and Parker did allow for several weeks in June with a net refund from the California ISO for CRA energy.

The California ISO hosted its annual summer readiness meeting on May 23, 2024. The CAISO reported that the system has added significant bulk energy storage (BES) capacity since the previous year, and they do not anticipate a significant risk of electric system disruptions for the upcoming summer operating season. Metropolitan resumed reporting weekly to the CAISO on the amount and duration of short-term load reduction available by reducing pumping at Gene and Intake pumping plants.

The CRA resumed full operation following the March shutdown, averaging about 7 pumps. Overall CRA pumping costs are trending below budget. The CRA energy cost budget for fiscal year 2023/24 is \$82.6 million; the current cost forecast for the year is significantly lower at \$41.7 million, because of reduced pumping earlier in the year and lower prices than forecast throughout the year. As we begin the next fiscal year, monthly costs are forecast to increase as energy prices increase for the summer.

Protect Source Waters and Ensure Water Quality Compliance

Metropolitan complied with all water quality regulations and primary drinking water standards during May 2024.

During the week of June 10, an external auditor assessed operations at the Water Quality Laboratory for compliance with drinking water laboratory accreditation requirements, ahead of a formal regulatory audit later in the year. The assessment showed that the laboratory conforms to required standards and is well-prepared for the regulatory audit. The auditor also provided mandatory annual Ethics and Data Integrity training for Water Quality staff.

Optimize Water Treatment and Distribution

The SWP target blend entering the Weymouth and Diemer plants was 25 percent during June. The SWP target blend entering Lake Skinner was 25 percent, while the blend leaving Lake Skinner was close to 20 percent. Flow-weighted running annual averages for total dissolved solids from April 2023 through March 2024 for Metropolitan's treatment plants capable of receiving a blend of supplies from the SWP and the CRA were 358, 445, and 466 mg/L for the Weymouth, Diemer, and Skinner plants, respectively.

Staff recently completed building a prototype sodium hypochlorite injection skid that can be deployed in multiple areas when chlorine boosting is needed to combat nitrification within the distribution system. This is a project that was done quickly to be able to be deployed this summer to assist in preventing potential nitrification events, if needed. The effort took coordination between Water Quality, Engineering, and C&D to design and construct. The need for such a system presented itself during last year's significant nitrification event.



Sodium hypochlorite injection skid prototype to manage nitrification in the distribution system

Staff recently installed a new 250 cfs flow orifice plate at the USG-03 service connection, located within the San Gabriel Mountains in Azusa Canyon. The USG-03 service connection branches from the 186-inch diameter Glendora Tunnel that receives raw water from the San Dimas PCS and the Rialto Pipeline downstream of East Branch of the SWP. For this service connection, flows are adjusted using manually installed orifice plates ranging from 25 cfs to 400 cfs. The newly installed 1-inch-thick stainless-steel orifice plate is approximately 54-inches in diameter and will control flow at about 250 cfs, in between the next closest orifice plates that control flow to about 200 cfs or 300 cfs. This new plate improves the ability to match downstream spreading basin capacity to maximize groundwater storage and help protect an SWP-Dependent Area from future droughts.



250 cfs flow orifice plate



Staff installing orifice plate at USG-03 service connection

Operations staff worked with Engineering to complete initial functional testing of two ozone generators at the Jensen plant. This work is part of refurbishment of the ozone generator system and power supply units and will provide Jensen with reliable ozone generation for the next 20 years. The generators will now undergo extended duration testing over the next month to further verify system operations.



Contractor installing new dielectrics for the ozone generators at the Jensen plant

Weymouth electricians replaced two Adjustable Speed Drive (ASD) controllers on the plant's return pumps in Filter Building No. 2. The ASDs were installed in the early 2000s and have recently been experiencing operational failures. The pumps are a critical part of the plant process to recycle the process water and return it to the ozone contactors. Electricians installed the ASDs and connected the wiring. Working with mechanical and control system staff, the work was completed in less than four hours, which allowed the plant to continue operation without any impacts to water quality or capacity.



Terminating cables and programming the new ASDs to control pumps at the Weymouth plant

Protect Infrastructure and Optimize Maintenance

The Desert section requires a specialized workforce to cover a large and geographically remote area of operations. One of these specialized crews is the Powerline Maintenance Team. This team performs high-voltage electrical work on a regular basis to maintain the Desert's legacy electrical transmission and distribution systems. Overhead electrical systems were repaired at Gene pumping plant as they can become damaged by regularly occurring high winds. Staff is trained and well equipped to make these critical repairs in the field.



Staff performing repairs to an overhead electrical bank at Gene Camp

The Desert Aqueduct Maintenance Team completed excavation and grading for a new crane pad at Gene pumping plant. This project was important to gain better access for crane work at the Copper Basin outlet structure. The new pad will allow cranes to be parked closer to the work zone and require less reach for heavy lifts while repairing gates, motors, and other components.



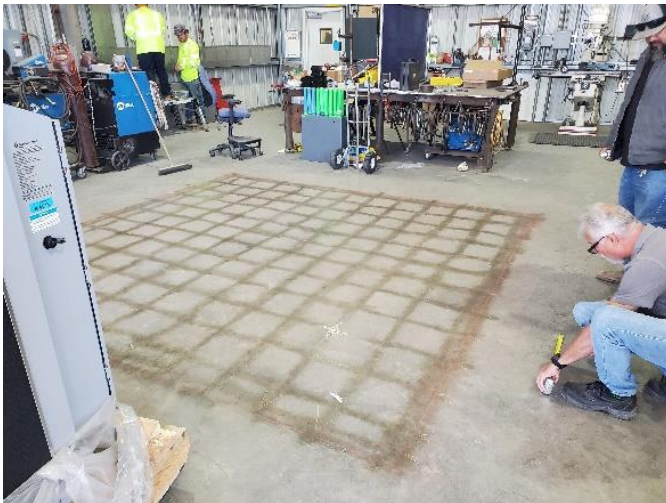
New crane pad for better access to perform maintenance

At the Gene pumping plant, disassembly and repair of the Unit 1 Discharge Valve continues. Before disassembly, an isolator fitting was installed to secure Unit 1 from the delivery line. Staff removed and stored the oil for the actuating mechanism and teardown. Assessment and refurbishment efforts are now in progress.

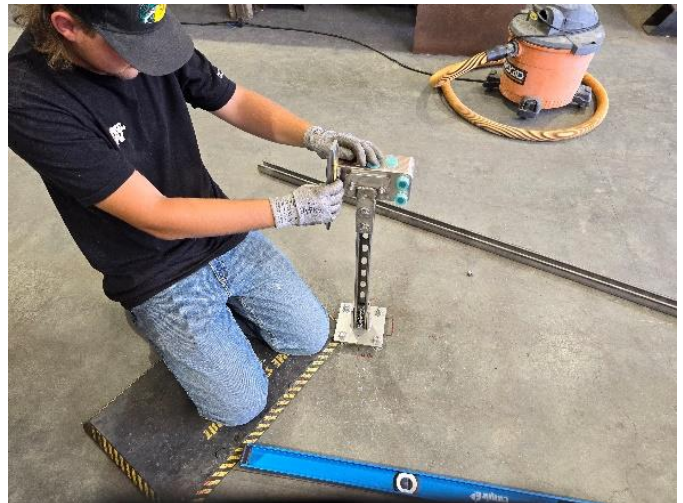


Discharge Valve repair at Gene pumping plant

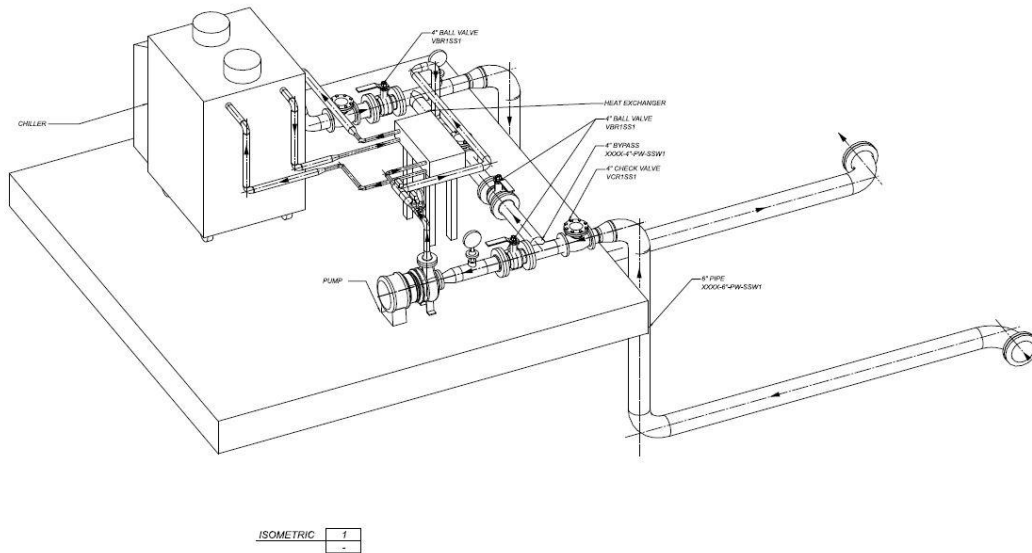
Staff began construction of the Eagle Mountain Village Domestic Water Loop Chiller System. The piping, controls, and components are being pre-assembled at the Lake Mathews facility to improve the efficiency of the system's installation. The system is designed to lower the temperature of the water main loop, which provides potable water to the residences at the facility.



Pad and rebar layout at Lake Mathews shop



Staff assembling chiller components



Chiller Loop Design

The Detention Peak communications site is a vital connection point to ensure reliable communications between the Desert facilities in the east and the Operations Control Center in the west. Redundant systems allow for backup in the event of a unit malfunctioning. One rectifier system recently failed, placing the Detention Peak communication site at a single point of failure. Staff successfully replaced the faulty rectifier system with a new unit, allowing the communication site to maintain the necessary redundancy.



Staff installing the new rectifier system at the Detention Peak communications site

Staff repaired a leaking 2-inch natural gas leak at the Weymouth plant. Staff reported a possible gas leak near the Ozone building. Staff completed the investigation and discovered that a steel riser had excessive corrosion, causing a small natural gas leak.



Staff excavating a gas line using Hydro-Excavation to prevent damage to utilities at the Weymouth plant

The La Verne Shops received a request to refurbish another 42-inch sleeve valve for the Auld Valley Pressure Control Structure. One sleeve valve was recently refurbished by the Shops and placed back in operation. A second sleeve was removed and sent to the Shops for assessment. This sleeve valve was recently disassembled and is being cleaned to assess its current condition before refurbishment.



Auld Valley PCS sleeve valve received at La Verne Shops for refurbishment



As received actuator (left) and disassembly of actuator (right) at the La Verne Shops for refurbishment

Staff recently cleaned and inspected the sedimentation basin and influent channel at the Diemer plant. The influent channel has been in service for several years, resulting in heavy algae growth and accumulation of solids at the bottom of the channel. Staff took this portion of the plant out of service, drained, cleaned, and performed preventative maintenance on the equipment.



Staff washing down the sedimentation basin and influent channel at the Diemer plant

Optimize Asset and Maintenance Management

Metropolitan staff across different groups and consultants collaborated to conduct a Constructability Review for several Diemer capital projects, including the Diemer Filter Rehabilitation Project and the Diemer Chemical Tank Farm Upgrade Project. This study was conducted over two weeks. Topics of discussion included lessons learned from the Weymouth Filter Rehabilitation Project, project risk mitigation, construction sequencing, construction schedule, and filter media selection.



Staff across multiple groups collaborated to conduct a Constructability Review for Diemer capital projects

Staff continues to implement best asset management approaches to develop a long-term 25-year renewal forecast that incorporates a transition of Metropolitan's fleet vehicles from internal combustion to zero emission. Options are being evaluated based on a careful balance between protecting Metropolitan's reliability, complying with regulations, and balancing costs. This is a collaborative effort with Finance staff to understand the benefits and impacts of various funding sources. Operations staff has been working collaboratively with Engineering to develop a long-term optimization model for the Capital Investment Plan. The model uses readily available software applications and considers stakeholder inputs, such as sponsor priority, risk, and other factors, to optimize capital spending and the sequencing of projects.

Prepare for Future Legislation and Regulations

On May 24, EPA published the final revisions to the Consumer Confidence Report (CCR) regulation. The regulation requires public water systems serving over 10,000 people to deliver CCRs twice a year, encourage modern electronic delivery options, clarify information regarding lead in drinking water, and provide translation for customers with limited English proficiency. The biennial requirement is only for community water systems that exceed a maximum contaminant level, health advisory, notification level, or response/action level, or have new Unregulated Contaminant Monitoring Rule (UCMR) results. As a wholesaler, Metropolitan is not required to do a CCR but will be required to provide water quality data to our member agencies twice per year. Staff worked with AMWA, AWWA, and CMUA on comments. Compliance with the new CCR content and delivery requirements begins April 1, 2025.

On June 11, Cal/OSHA released the final text for the Indoor Heat Illness Prevention Standard. The rule applies when indoor workplaces temperatures meet or exceed 82°F while employees are present. The rule requires industry to develop written indoor heat illness prevention procedures, assess areas affected by excessive heat, and determine appropriate control measures (e.g., provide cooling, breaks, monitoring for signs of heat illness, and training). Staff is combining the existing Outdoor Heat Illness Prevention Standard with new requirements from the Indoor Heat Illness Prevention Standard into one Metropolitan Heat Illness Prevention Program. Cal/OSHA is scheduled to adopt the rule on June 20, 2024, with an effective date starting in July 2024.

Advance Education and Outreach Initiatives

Tours of the Water Quality Laboratory were provided on June 6 and June 28 for Metropolitan Directors and guests from their respective agencies and represented communities. These tours provide a broad summary of Water Quality's daily activities, regulatory monitoring requirements, and applied research to address emerging water quality challenges.

Engage with Member Agencies and Other Stakeholders on Technical Matters

On June 27, Metropolitan hosted a hybrid half-day workshop on nitrification and chloramine disinfection for Member Agency Water Quality Managers. The workshop provided a basic understanding of the causes, consequences, and control of distribution system nitrification. Key presentations by Metropolitan staff and an external industry expert included the microbiology of nitrification, a review of the 2023 nitrification event in Metropolitan's system, and a discussion on the various factors to consider in response to nitrification.



Engineering, Operations, & Technology Committee

Management Announcements and Highlights

Item 7a

July 8, 2024

Engineering Services

Pure Water Southern California Panel at ACE(24)



Left to Right: Kim Wilson, Rupam Soni, Gloria Lai-Bluml, Heather Collins (AWWA Board President-Elect), Bruce Chalmers, and Derek Zondervan (LACSD)

Garvey Reservoir Rehabilitation Projects Outreach to City of Monterey Park



Site tours with city council members & city staff



Presentation by Sam Mouawad to
Monterey Park City Council

2024 Engineering Services Group – College Intern Program



Left to Right: Chris Garcia, Erick Estrada Perez, Amornwat Kitsiri, Matthew Sanchez, Jad Darwish, Giovanni Reynoso, Summer Minter, Avianah Butler, Alyssa Lee, and Theodore Nguyen

- Opportunity for Junior/Senior engineering students to gain experience in design or construction management
 - Approx. 284 students since inception
- Majors of this year's interns include:
 - Chemical Engineering
 - Civil Engineering
 - Electrical Engineering
 - Environmental Engineering
 - Mechanical Engineering

Water System Operations

Managing State Water Project Supplies

Current Operational Conditions



Deliveries to USG-03

- 2024 SWP Allocation at 40%
- CRA at 7-pump flow
- Deliveries to DWCV at ~740 cfs
- Deliveries to CUP and Cyclic ongoing
- SWP blend targets are 25% at Weymouth, Diemer, and Skinner
- June 2024 deliveries of 102 TAF were 3 TAF lower than June 2023

Managing State Water Project Supplies

July 2024
Operations

*Manage SWP supplies to
meet storage goals*

Maintain 25% SWP blends

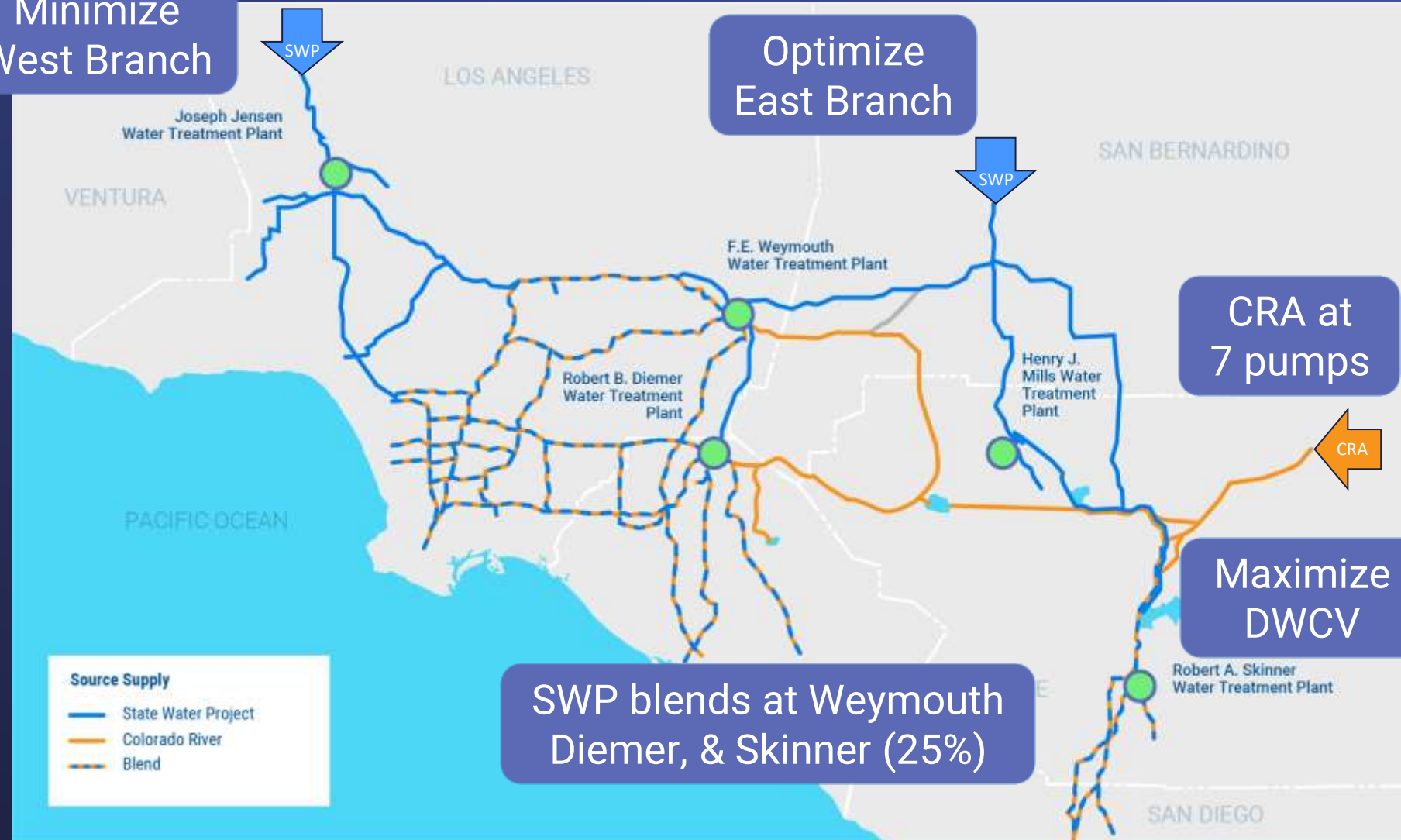
Minimize
West Branch

Optimize
East Branch

CRA at
7 pumps

Maximize
DWCV

SWP blends at Weymouth
Diemer, & Skinner (25%)



Member Agency Water Quality Managers Nitrification Workshop

June 27, 2024



- Information on causes, consequences, and control of nitrification in distribution systems
- Presentations by Water Quality staff and an industry expert, including response to 2023 nitrification event
- In-person at Metropolitan's Water Quality Laboratory and virtual
- ~120 participants from over 50 agencies



Recognition for Water Treatment Plants and Distribution System Optimization

Partnership Programs

*25-Year Directors Awards
for Diemer, Jensen, and
Skinner*

*10-Year Directors Award
for Distribution System*

AWWA ACE, June 2024



*Demonstrated commitment to optimized performance of
water system operations beyond regulatory requirements*



Annual Water Quality Report

Metropolitan's water
quality is equal to or better
than what is required to
safeguard public health

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Celebrating

5

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

WATER QUALITY LAB

YEARS
1974 - 2024

WATER QUALITY EXCELLENCE
2024 ANNUAL DRINKING
WATER QUALITY REPORT

Covering the reporting period January - December 2023

METROPOLITAN'S WATER QUALITY IS EQUAL TO OR BETTER THAN WHAT IS REQUIRED TO SAFEGUARD PUBLIC HEALTH.

2023 Water Quality Table

	B	C	D	F	S	H	I			
Treatment Plant Effluents and Distribution Systems										
Parameter	Units	State MCS	PFC	Range Average	Domestic Plant	Jensen Plant	80th Plant	Skinner Plant	Westwood Plant	Major Sources to Drinking Water
Percent State Water Project	%	NA	NA	Range 0 - 100	100	100	0 - 67	0 - 100	Not Applicable	
PRIMARY STANDARDS - Mandatory Health-Related Standards										
CLARITY										
Combined Filter Effluent (CFE) Turbidity ¹	NTU	TT	NA	Highest 0.08	0.07	0.07	0.07	0.07	0.04	Soil runoff
	%			% ± 0.3	100	100	100	100	100	
MICROBIOLOGICAL ²										
Total Coliform Bacteria ³	% Positive Monthly Samples	TT	MCLD = 0	Range Average	Distribution Systemwide: 0 - 0.3			Distribution Systemwide: 0.07		Naturally present in the environment
INORGANIC CHEMICALS										
Aluminum ⁴	ppb	1,000	660	Range Highest SAA	ND - 73 105	ND - 83 ND	ND - 88 60	ND - 110 113	ND - 71 115	Residue from water treatment process; runoff and leaching from natural deposits
Barium	ppb	1,000	2,000	Range Average	ND ND	ND ND	ND 116	ND	ND	Oil and metal refineries; discharge; natural deposits erosion

Metropolitan's service area is expansive. It spans parts of six counties and 5,200 square miles. Our closest routine sample location is less than a mile from the La Verne Water Quality Laboratory, with the furthest 250 miles away. Sample collectors travel more than 150,000 miles each year by car and plane to bring samples in for analysis. Staff rely on nearly 500 different types of analytical equipment and use about 150 methods to evaluate samples. In a given year, about 250,000 water quality test results are generated.

Water Quality Co-Op Education



Safiya Hassan

Training Tomorrow's Workforce

- Cal Poly Foundation paid internship program started in early 1980s
 - Sophomore/junior/senior students in science and engineering from accredited universities
 - Bridging gap between theoretical study and professional world
- Over 300 students since inception
 - Over 30 became full-time employees, several as managers
- Opportunity for Metropolitan staff to develop leadership and management skills



*John Huang and
Pegah Tajvidi*



*Ryan Heumann and
Nathan Chen*

Safety and Security Awareness

Celebrating National Safety Month

*Safety awareness
events held at
multiple facilities
during June*



Gene



Weymouth



Soto St



Skinner



Jensen



June 27, 2024

Weymouth Plant Domestic Water Line Failure



Damaged PVC piping
July 8, 2024

Responding to Emergencies

- Domestic water line (6-inch PVC) piping failure at 9:30 PM
 - Root cause being investigated
- Flooded basement of Administration Building impacted electrical equipment, resulting in temporary loss of all site communications
- Excellent response by staff to quickly respond, restore SCADA, isolate damage, dewater, and repair facilities
 - Weymouth ICP activated
 - Station power, communication systems, and domestic water service restored over weekend
- No injuries; no impacts to water quality or treated water deliveries



Domestic Water Line Failure
Item # 7a Slide 14

Information Technology

2024 Information Technology Group – College Intern Program

Opportunity for college students and recent graduates to gain professional experience

Students from their respective universities represented in this year's intern cohort:

- Brenden Archer – Morehouse College, Atlanta, GA
- Christy Jose – University of California, Santa Cruz
- Jad Aljersh – CSU Northridge, Los Angeles, CA

Majors of this year's interns include:

- Software Engineering
- Network and Digital Technology
- Geographic Information Science

