ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

January 3, 2025
(2023-005.07)

Ms. Mitzi Kim Rios
Los Angeles County Public Works
900 South Fremont Avenue, 9th Floor
Alhambra, California 91803

Re: Devil's Gate Reservoir Restoration Project – Phase 3 Restoration Qualitative Monitoring Conducted on December 11, 2024

1.0 INTRODUCTION

The purpose of this letter report is to document the results of qualitative monitoring (horticultural) conducted for the Devil's Gate Reservoir Restoration Project (Project), located in the City of Pasadena, Los Angeles County, California. The qualitative monitoring was conducted in the planted and or seeded portions of the Phase 3 mitigation areas including DG-4 WOUS, DG-4 WOUS Connections, DG-4A, the Tire Wash, and the Side Slopes (including Flint Wash). Due to the timing of container plant and stake installation being late in the ideal planting season in DG-4 WOUS, DG-4 WOUS Connections, DG-4A, and the Tire Wash, these areas were not seeded during the initial seed application effort. In addition, only a portion of the Side Slopes was seeded during the initial seed application effort due to access issues in these areas from wet soils. The seeding in DG-4 WOUS, DG-4 WOUS Connections, DG-4A, the Tire Wash, Flint Wash, and the remainder of the Side Slopes was completed during a follow-up seeding effort, which was initiated in November of 2023. The monitoring is being conducted in accordance with the Final Habitat Restoration Plan (HRP) for the Project. Active sediment removal is occurring on an annual basis within the sediment removal areas for the Project and habitat restoration is being conducted onsite around the perimeter of the sediment removal areas.

ECORP is responsible for conducting qualitative monitoring and compliance review of restoration efforts in each of the mitigation areas. ECORP is also responsible for preparing monitoring reports, which typically include the following information:

- Overall health of container plants.
- Observations and recommendations related to container plant establishment.
- Germination of native plant species from seed application and natural recruitment.
- Level of germination of nonnative plant species.
- Soil condition.
- Other observations and recommendations as appropriate.

Qualitative monitoring was conducted by Carley Adams on December 11, 2024. Field data collected during the monitoring event is provided as Appendix A. This report documents the second quarterly qualitative monitoring visit for the Phase 3 mitigation areas.

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2.0 QUALITATIVE MONITORING IN THE PHASE 3 MITIGATION AREAS

2.1 Brief Summary of Plant Installation

During the Phase 3 plant installation effort that was completed on April 28, 2023, a total of 4,124 4-inch container plants and a total of 4,967 cuttings were installed in the DG-4 WOUS, DG-4 WOUS Connections, and DG-4A mitigation areas. In addition, a total of 81 1-gallon container plants were installed in the Tire Wash mitigation area. Container plants and stakes were not installed in the Side Slopes or Flint Wash mitigation areas; however, these areas were included in the weed removal effort and seeding effort. Table 1 lists container plant species and the numbers installed in each of the Phase 3 mitigation areas.

Table 1. Summary of Container and Stake Planting

Scientific Name	Common Name	DG-4 WOUS	DG-4 WOUS Connections	DG-4A	Tire Wash	Total
Artemisia douglasiana	Mugwort	192	21	537	0	750
Baccharis pilularis	Coyote bush	192	21	537	0	750
Baccharis salicifolia	Mulefat (stakes)	506	55	1,414	0	1,975
Populus fremontii	Fremont's cottonwood	192	21	537	0	750
Rosa californica	California rose	192	21	537	0	750
Rubus ursinus	California blackberry	192	21	537	0	750
Salix gooddingii	Black willow (stakes)	383	42	1,071	0	1,496
Salix lasiolepis	Arroyo willow (stakes)	383	42	1,071	0	1,496
Sambucus mexicana	Mexican elderberry	96	10	268	0	374
Acmispon glaber	Deerweed	0	0	0	9	9
Artemisia californica	California sagebrush	0	0	0	24	24
Encelia californica	California brittlebush	0	0	0	10	10
Eriogonum fasciculatum	California buckwheat	0	0	0	24	24
Isocoma menziesii	Menzie's goldenbush	0	0	0	5	5
Salvia mellifera	Black sage	0	0	0	9	9
	Total	**2,328**	**254**	**6,509**	**81**	**9,172**

All plants were installed according to the methods described in Section 4.11 of the HRP. Planting holes for all container plants were dug to a width twice the size of the root ball and to a depth slightly deeper than the depth of the root ball so that the root crown was 1 inch below grade following installation. Prior to installation, all plants were thoroughly watered in their containers and the soil in planting holes was

wetted with at least 1 gallon of water. Planting holes were backfilled with native soil and irrigation basins, approximately 2 feet in width, were formed around the base of each plant. Rocks greater than 2 inches in diameter were removed to the extent possible from the backfill soil. All container plants were irrigated with at least 1 gallon of water immediately following installation and basin creation.

2.2 Qualitative Monitoring Methods

Qualitative monitoring occurs monthly following the 120-day Plant Establishment Period for the remainder of Year 1 (8 months). Following Year 1, qualitative monitoring will occur quarterly during Years 2 and 3 and twice per year during Years 4 through 10. The purpose of the qualitative monitoring is to assess container plant health and vigor and monitor the success of the mitigation areas.

During the December 11, 2024 visit, all Phase 3 mitigation areas were walked, the health and vigor of container plants were documented, germination from seeding and natural recruitment was noted, and the irrigation lines were inspected for functionality. In addition, the level of nonnative and invasive weed cover was estimated for each of the Phase 3 mitigation areas.

2.3 Qualitative Monitoring Results

Overall, the Phase 3 mitigation areas appear to be performing well. Evidence of dieback from *Phytophthora cactorum*, including wilting, stunted growth, leaf spotting, and/or browning along leaf margins and tips, was not observed in any of the mitigation areas during the monitoring visit. Formal mortality counts were taken for the Phase 3 mitigation areas during the 2024 quantitative monitoring events. Some of the container plants within the Phase 3 mitigation areas were noted as lacking well defined basins and should have their basins properly constructed and/or repaired. Many of the willows (*Salix* spp.) and Fremont's cottonwoods (*Populus fremontii*) were showing signs of seasonal dieback and many of the annual species were observed to be dead for the season. The installation of plants in the Phase 3 mitigation area appears to have been completed successfully and the current issues identified during the monitoring visit are not expected to influence the continued growth of the plants in the mitigation areas.

2.3.1 DG-4 WOUS/DG-4 WOUS Connections

The overall health of the container plants in DG-4 WOUS and DG-4 WOUS Connections was noted as being good. Approximately less than 5 percent of the container plants and stakes in DG-4 WOUS and DG-4 WOUS Connections were noted as showing signs of stress and a negligible amount were noted as being dead or missing. This is slightly less than the percentage of plants that were showing stress during the previous monitoring visit. Stress may be occurring as a result of 1) transplant shock, 2) herbivory by rabbits or other wildlife, 3) competition from nonnative and invasive weeds, 4) misplaced emitters, or 5) recreational traffic through the mitigation areas. Photos 1 through 4 in Appendix B document the mitigation areas during the monitoring visit.

Native plant germination from seed application and natural recruitment was noted throughout the DG-4 WOUS and DG-4 WOUS Connections mitigation areas. The native species observed sprouting in the DG-4 WOUS and DG-4 WOUS Connections mitigation areas included mulefat (*Baccharis salicifolia*), Canada

horseweed (*Erigeron canadensis*), salt heliotrope (*Heliotropium curassavicum*), ladies' tobacco (*Pseudognaphalium californica*), and stinging nettle (*Urtica dioica*). Native cover was estimated to be approximately 70 to 75 percent during the monitoring visit.

Nonnative weed cover in DG-4 WOUS and DG-4 WOUS Connections was estimated at approximately 2 percent, which is approximately 3 percent lower than the percentage of weed cover that was observed during the previous monitoring visit. Nonnative species observed included black mustard (*Brassica nigra*) and poison hemlock (*Conium maculatum*). Most of the nonnative weeds observed in these mitigation areas were just starting to germinate and had not gone to flower or started to produce seed. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease.

2.3.2 DG-4A

The overall health of the container plants in DG-4A was noted as being good and this mitigation area is becoming well established. Approximately 5 percent of the container plants and stakes in DG-4A were noted as showing signs of stress which is approximately the same percentage of plants were showing signs of stress during the previous monitoring visit. This included the remaining container plants from the first installation and the container plants that were installed to replace the container plants and stakes planted in the middle section of DG-4A that appeared to be dead or in a condition unlikely to recover during previous monitoring visits. Stress may be occurring due to similar reasons described for DG-4 WOUS and DG-4 WOUS Connections. Photos 5 through 8 in Appendix B document the mitigation area during the monitoring visit.

Native plant germination from seed application and natural recruitment was noted throughout the DG-4A mitigation area. Native plants such as mugwort (*Artemisia douglasiana*), mulefat, Canada horseweed, and stinging nettle were observed sprouting in the mitigation area. Native cover was estimated to be approximately 60 to 65 percent during the monitoring visit.

Nonnative weed cover in the DG-4A mitigation area ranged from approximately 5 to 10 percent during the monitoring visit, depending on the section of DG-4A, which is approximately 5 percent lower than what was observed during the previous monitoring visit. Nonnative species observed included black mustard, poison hemlock, and perennial pepperweed (*Lepidium latifolium*). Most of the nonnative weeds observed in these mitigation areas were just starting to germinate and had not gone to flower or started to produce seed. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease; however, perennial pepperweed easily resprouts from rhizomatous roots that can be difficult to fully remove with hand tools.

2.3.3 Tire Wash

The overall health of the container plants in the Tire Wash mitigation area was noted as being good. Approximately less than 5 percent of the container plants were noted as showing varied levels of stress, which is slightly lower than the percentage of plants that were showing stress during the previous monitoring visit. This included the remaining container plants from the first installation and the replacement container plants that were installed to replace the container plants that were either missing

or appeared to be dead or in a condition unlikely to recover during previous monitoring visits. Most of the stress was observed on the recently installed container plants. Stress may be occurring due to similar reasons described for DG-4 WOUS and DG-4 WOUS Connections. In addition, some of the container plants are being smothered by deerweed (*Acmispon glaber*), which is proliferating in this area. The irrigation was found to be functioning properly for this mitigation area. Photo 9 in Appendix B documents the mitigation area during the monitoring visit.

Native plant germination from natural recruitment was noted throughout the Tire Wash mitigation area. Native plants such as deerweed, California sagebrush (*Artemisia californica*), telegraph weed (*Heterotheca grandiflora*), ladies' tobacco, and black sage (*Salvia mellifera*) were observed sprouting in the mitigation area. Native cover was estimated to be approximately 85 to 90 percent during the monitoring visit.

Nonnative weed cover in the Tire Wash mitigation area was estimated at approximately less than 1 percent, which is approximately the same percentage of nonnative cover that was observed during the previous monitoring visit. Nonnative species observed included black mustard and Spanish broom (*Spartium junceum*). Most of the nonnative weeds observed in this mitigation area were just starting to germinate and were not going to flower or producing seed. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease.

2.3.4 Side Slopes and Flint Wash

Container plants were not installed on the Side Slopes or in Flint Wash, but these areas were seeded with native plant species. Native plant growth was noted throughout the Side Slopes and Flint Wash, likely both from natural recruitment and from seeding. Portions of the Side Slopes that were previously noted as having significant erosion that occurred as a result of heavy rainfall during the 2023 wet season and following the tropical storm that occurred in late August 2023 were noted as having been repaired during previous monitoring visits and were included in the supplemental seeding effort initiated in November of 2023. During the monitoring visit, the hydroseeded portions of the Side Slopes where previous erosion had occurred showed minimal germination; however, the level of native cover was observed to be higher in these areas during the December monitoring visit than during previous monitoring visits and some areas appear to be stabilizing. The lower level of germination on these portions of the Side Slopes could be due to lack of soil nutrients, lack of organic matter, and/or incorrect compaction levels. Native plants such as mugwort, mulefat, Canada horseweed, telegraph weed, grape-soda lupine (*Lupinus excubitus*), and black willow (*Salix gooddingii*) were observed sprouting on the Side Slopes and in Flint Wash. Overall native cover was estimated to be approximately 45 to 50 percent during the monitoring visit; however, portions of the Side Slopes that have previously had erosion issues had a lower level of cover. Photos 10 through 12 in Appendix B document the Side Slopes during the monitoring visit.

Nonnative weed cover on the Side Slopes and Flint Wash was estimated at approximately 5 percent overall, which is approximately the same percentage of weed cover that was observed during the previous monitoring visit. It should be noted that a small portion of the Side Slopes on the west side of the reservoir near the southern extent has a high level of thatch that should be removed immediately. Nonnative species observed on the Side Slopes and Flint Wash included black mustard, poison hemlock, perennial pepperweed, and curly dock (*Rumex crispus*). Most of the nonnative weeds observed in this

mitigation area were just starting to germinate; however, some were starting to flower and will soon go to seed. These areas should be weeded prior to seed production. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease; however, perennial pepperweed easily resprouts from rhizomatous roots that can be difficult to fully remove with hand tools.

3.0 RECOMMENDATIONS

3.1 Nonnative Plant Control

Nonnative weed cover ranged from approximately less than 1 percent to 10 percent in the various mitigation areas. During the monitoring visit, some of the weed growth observed within the mitigation areas was mostly vegetative and was not flowering or seeding; however, species that were observed to be in flower should be removed prior to seed production. Regular maintenance and removal of nonnative weeds is of the highest priority for all of the mitigation areas and side slopes to reduce competition between native and nonnative plants. A focus should be placed on removing the weeds and nonnatives from the basins of each of the container plants and cuttings; however, nonnative weeds just outside of the planting areas can migrate into the planting areas via seed dispersal. Outside of the nesting bird season, a focus should also be made to remove nonnative weeds in areas where least Bell's vireos are likely to nest during the breeding season (i.e., in the vicinity of the least Bell's vireo nest that was active in 2020). Nonnative plants and weeds that have gone to seed should be bagged and removed from the mitigation area. Without the use of herbicides, control of the nonnatives will be extremely difficult so the frequency and level of effort will need to be increased to provide control until the native plants and seedlings have a chance to grow and outcompete the nonnatives. In particular, it is important to maintain long-term perennial pepperweed management to reduce competition and allow native plants to germinate. In addition, dodder should be removed from container plants in the mitigation areas. Although many species of dodder are native, this parasitic plant can be harmful to younger shrubs and trees that are not yet established and can even cause mortality.

3.2 Irrigation

The irrigation system was inspected for functionality and appeared to be properly installed. Irrigation was actively occurring during the monitoring visit. Some of the emitters were observed to be outside of the container plant basins, likely due to erosion, water flow, and/or public interference. Twice weekly watering events should be conducted for the container plants unless adequate rainfall occurs. After watering, the container plant basins should have at least 0.5 inch of saturation depth. Continual maintenance of the irrigation system should be conducted to ensure all plants are evenly watered and the tube emitters are placed at the base of the container plants. Watering of the areas that were only seeded is not recommended.

3.3 Herbivory

Only minor herbivory of container plants was observed in the Phase 3 mitigation areas. Minor herbivory generally will not kill the plants, but continued monitoring should be conducted during future visits to

determine if herbivory is worsening. As the plants become more established, they will be less susceptible to the effects of herbivory. It should be noted that cages were installed by Nature's Image around container plants that appeared to be most susceptible to herbivory following container plant installation; however, most of the container plants have become well enough established the cages have been removed.

3.4 Erosion

Portions of the Side Slopes that were previously noted as having significant erosion that occurred as a result of heavy rainfall during the 2023 wet season and following the tropical storm that occurred in late August 2023 were noted as having been repaired during previous monitoring visits and were included in the supplemental seeding effort which was completed in November of 2023. Some additional erosion was observed at the toe of the Side Slopes in these areas and has the potential to worsen. In addition, one area of severe erosion that was noted on the eastern Side Slopes at the southwestern extent of DG-2 WOUS during the previous monitoring visit was still present and had not been repaired. As more perennial plants become established on the Side Slopes, erosion should become less of an issue; however, action will need to be taken to repair the damage caused by the erosion and measures should be taken to reduce damage from erosion in the future. In addition, if the supplemental seeding effort does not produce germination on the previously eroded Side Slopes, adaptive management techniques will likely be warranted. During future monitoring events, erosion should continue to be monitored in all planted areas and if warranted, erosion Best Management Practices should be installed in appropriate areas. This may only require the installation of straw wattles at select sites to prevent existing rills from becoming larger.

If you have any questions about the information presented in this letter, please contact me at Cadams@ecorpconsulting.com or (714) 732-9266.

Sincerely,

Carley (Lancaster) Adams
Senior Biologist

LIST OF APPENDICES

Appendix A – Field Notes

Appendix B – Photo Documentation

APPENDIX A

Field Notes

Devil's Gate Phase 3 Qual
12/11/24
C. Adams

DG-4 Wous
- Native germ: ERICAN, BACSAL URTDIO, HELCUR, PSECAL ~70-75% cover
- Nonnative germ: CONMAC, BRANIG ~2-4% mostly veg
- willows & cottonwoods showing seasonal dieback
- Some small mammal damage to willows <5% stress
- most annuals dead for season

DG-4A
- Native germ: ERICAN ARTDOU, URTDIO, PSECAL BACSAL 60-65% cover
- Nonnative germ: CONMAC, BRANIG, LEPLAT ~5-10% cover
- ~5% of plants w/ minor stress → willows & POPFRE showing seasonal dieback

Scale: 1 square = _____

Rite in the Rain

Side Slopes

- Native germ: ARTBOW, BACSAL, SALGOG, DIPAUR, ERICAN, HETCRA, LUPEXC
- Nonnative germ. BRANIG, RUMCRI, CONMAC, LEPLAT ~ 5% →
S. end w/ thatch that needs to be removed ~ 25% cover in this area

Tire Wash

- Native growth: SALMEL, ARTCAL, PSECAL, ACHCRLA, HETCRA, BACSAL ~ 85-90% cover,
- Nonnative BRANIG < 1%, BRAJUN
- Site is thriving → ACHCRLA dom.
- less than 5% of plants showing signs of stress
- annuals mostly dead for season

Scale: 1 square = _____

APPENDIX B

Photo Documentation

Photo 1. Overview DG-4 WOUS & WOUS Connections

Photo 2. Overview DG-4 WOUS & WOUS Connections

Photo 3. Overview DG-4 WOUS & WOUS Connections

Photo 4. Overview DG-4 WOUS & WOUS Connections

Photo 5. Overview DG-4A

Photo 6. Overview DG-4A

Photo 7: Overview DG-4A

Photo 8: Overview DG-4A

Photo 9: Overview Tire Wash

Photo 10: Overview Side Slopes

Photo 11: Overview Side Slopes

Photo 12: Overview Side Slopes