

APPENDIX C

Lagoon Effects Technical Memorandum

Technical Memorandum

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Subject:	Doheny Ocean Desalination Project – Update of Lagoon Analysis	

1.0 INTRODUCTION

An analysis of potential impacts to the shallow aquifer and lagoon levels from the Doheny Ocean Desalination Project wellfield was conducted in 2017. The results of the impacts analysis, among other considerations, were provided in the Geoscience report entitled “Doheny Ocean Desalination Project, Model Update and Refinement from Onshore and Offshore Geophysical Data,” dated March 1, 2018 (the March 1, 2018, report is included as Appendix 10.10.1 to the Environmental Impact Report). The work consisted of analyzing three operational scenarios from slant wells pumping from both the sides of San Juan Creek at the shoreline of the Pacific Ocean. Figure 1 shows the location of the slant wells as proposed for the full-scale Doheny Ocean Desalination Project as of December 2017. Model Scenario 1 included 10 million gallons per day (MGD) of pumping from the three wells located at Pod D (see Figure 1). Recently, the Doheny State Beach campground (the site of Pod D and Pod E) has become available for a continuous period of 18 months while the State Parks attend to campground upgrades that have been in the planning stage for some time. The advantage of using the campground site for construction of the project slant well wellfield is a single mobilization for the project, rather than the three mobilizations previously planned, and being able to keep the wellfield pipe conveyance system on the same side of San Juan Creek. The purpose of the analysis summarized by this technical memorandum was to evaluate whether the use of slant wells located at Pod D and Pod E would have no greater impacts to the lagoon water levels than reported from the previous 2017 analysis. Decreased impacts were found.

2.0 CHANGES IN CONFIGURATION OF SLANT WELL WELLFIELD

Figure 1 shows the previous configuration of the slant well wellfield. Pod D consisted of three wells (wells D1, D2, and D3). Pod E, located further east, consisted of two slant wells (wells E1 and E2). The wells are planned to be 1,000 feet in length and drilled at an approximate angle of 10 degrees below the horizontal into the offshore groundwater aquifer, which is present within the offshore portion of the San Juan Creek paleochannel. Figure 2 shows the new configuration of the proposed slant well wellfield at Doheny State Beach¹. Pod D consists of two slant wells (D2 and D3) and Pod E has two slant wells (E1 and E2). The length and angles of the slant wells remain the same. The number of slant wells required to meet the 10 MGD pumping demand will be re-assessed after the construction and testing of each new well. The current design consists of two well pods at Doheny State Beach campground.

3.0 UPDATED MODEL PREDICTIVE SCENARIOS

Scenario 1 of the 2017 modeling analysis consisted of pumping a total of 10 MGD from the combined three slant wells located at Pod D. Figure 3 shows the locations of the three Pod D slant wells. Two additional scenarios were added to the previous work conducted in 2017 (i.e., this analysis). Scenario 4 consists of 10 MGD pumping from slant wells D2 and D3 at Pod D and from slant well E1 at Pod E, as shown on Figure 4. Scenario 5 simulates 10 MGD pumping from slant wells D2 and D3 at Pod D and slant wells E1 and E2 at Pod E, as shown on Figure 5. Table 1 below summarizes the assumptions of the predictive scenarios.

Table 3-1 Assumptions for Predictive Scenarios

Model Run	Pumping Volume and Location
Scenario 1	Project Pumping of 10 MGD from Slant Wells D1, D2, and D3
Scenario 4	Project Pumping of 10 MGD from Slant Wells D2, D3, and E1
Scenario 5	Project Pumping of 10 MGD from Slant Wells D2, D3, E1, and E2

¹ While Figure 2 shows two slant well pods, there may be up to three pods in the campground, depending on initial well production.

4.0 MODELING RESULTS

The predicted relative change in lagoon levels and in the shallow aquifer, which is present beneath the lagoon, as a result of slant well pumping was calculated as the difference between model-simulated lagoon levels and shallow aquifer levels under baseline conditions (No Project) and model-simulated lagoon levels under the project conditions. The shallow aquifer is separated from the bottom of the lagoon by a 3-foot-thick clay layer (aquitard) that extends downward from the bottom of the lagoon. Because of the clay layer, pumping at the coast has no direct impact on surface water levels in the lagoon. Minor changes in lagoon surface water levels occur as a result of slightly increased surface water recharge in the stream reaches above the lagoon.

Table 4-1 provides a summary of changes to the groundwater levels in the shallow aquifer and lagoon levels.

Table 4-1 Summary of Scenario Results

Model Run	Impact on Shallow Aquifer	Impact on Lagoon Level
Scenario 1 (Project Pumping of 10 MGD from Slant Wells D1, D2, and D3)	-10.46 to -13.96 ft	-0.14 to -0.26 ft
Scenario 4 (Project Pumping of 10 MGD from Slant Wells D2, D3, and E1)	-9.44 to -13.06 ft	-0.07 to -0.25 ft
Scenario 5 (Project Pumping of 10 MGD from Slant Wells D2, D3, E1, and E2)	-8.88 to -12.44 ft	-0.06 to -0.25 ft

5.0 SUMMARY OF RESULTS

Modeling of additional Scenarios 4 and 5, which represent a new configuration and operation of the proposed slant wells at Doheny State Beach, shows that using wells further to the east (well E1 in Scenario 4 and wells E1 and E2 in Scenario 5) decreases the changes in shallow groundwater levels and lagoon levels from full-scale pumping of the Doheny Ocean Desalination Project.

6.0 REFERENCES

Geoscience (Geoscience Support Services, Inc.), 2017. Doheny Ocean Desalination Project, Model Update and Refinement from Onshore and Offshore Geophysical Data. Prepared for South Coast Water District / GHD, dated March 1, 2018.

FIGURES

GEOSCIENCE

A blue graphic element consisting of two curved lines that meet at a point at the bottom, resembling a stylized 'V' or a bridge.









