

APPENDIX G
Hydrology Memorandum

MEMORANDUM

September 17, 2012

To : Shawn Shamlou

From : Trey Driscoll, PG, CHG

RE : Potential Hydrology Impacts Analysis for the Coastal Treatment Plant Export Sludge Force Main Project, Aliso Creek, SOCWA

This Hydrology and Water Quality Technical Memorandum addresses potential environmental consequences of the proposed Coastal Treatment Plant (CTP) Export Sludge Force Main Project.

Project Description

The proposed CTP Export Sludge Force Main Project would replace approximately 16,600 feet of two parallel 4-inch cast iron pipelines between the CTP and Alicia Parkway. The proposed project is located within the Aliso and Wood Canyons Wilderness Park (AWCWP), a County designated Wilderness Park that encompasses approximately 3,900 acres of natural open space lands within southwestern Orange County. AWCWP includes the hills, canyons and floodplain surrounding Aliso and Wood Canyons and portions of Laguna Canyon. AWCWP is almost completely surrounded by urban development associated with the communities of Aliso Viejo, Laguna Niguel, Laguna Hills, Laguna Woods, and Laguna Beach. The Aliso Creek Golf Course is located immediately to the south of the CTP. Residential development primarily lines the rims of the canyons along the border of AWCWP. Other land uses bordering the park include neighborhood parks, Soka University and an elementary school. The CTP is located approximately one mile inland from the Pacific Ocean.

The proposed project would replace the dual export sludge force main with a single 6-inch force main made of high density polyethylene (HDPE). The pipeline will run along the east side of Aliso Creek, within the existing 30-foot Effluent Transmission Main (ETM) easement (see Figure 1), in one of three orientations (A, B and C) relative to the creek and other utilities along different segments. In Alignment A, the 6-inch force main will be placed on the far side of the existing ETM from Aliso Creek at a depth of approximately four feet. In Alignment B, the 6-inch force main is placed between the two existing 4-inch force mains. In Alignment C, the 6-inch force main will be placed on the creek side of the existing ETM at a depth of approximately four

feet. The 6-inch force main would tie in with the force main that was installed beneath Aliso Viejo Community Association (AVCA) road in the early 2000's.

A plan profile drawing (Figures A1, A2, A3) shows the proposed alignment from two perspectives. The profile view (which is the top part, the gridded section) is an elevation view in a longitudinal direction. The plan view (which is the bottom part, the ungridded section) is an overhead perspective. Stationing is used as the horizontal reference grid on the centerline. The stationing increases from left to right at increments of 100 feet. Any point between two stations is shown as +XX. For example, 23 feet ahead of Station 30 is written as Station 30+23.

Project Site Existing Conditions

Site Topography

The elevation of the Export Sludge Force Main pipeline alignment varies from 44 feet above mean sea level (amsl) in Aliso Creek at the CTP to 154 feet amsl at Alicia Parkway. The proposed alignment will run along the east side of Aliso Creek. The topography surrounding the proposed pipe alignment is characterized by an incised creek bed, steep, erosive channel banks and the Niguel Hills rise steeply on either side of the creek.

Surface Water

The Project Site is within in the San Juan Hydrologic Unit (HU) (901.00), which is one of the eleven hydrologic units established within the Water Quality Control Plan for the San Diego Basin (Basin Plan). The San Juan HU is divided into five Hydrologic Areas (HA) and the proposed project site is within the Laguna HA (901.10). The Laguna HA is divided into four Hydrologic Sub-Areas (HSA) and the proposed project site is within the Aliso HSA (907.13).

The Aliso Creek watershed encompasses a drainage area of 34.6 square miles (22,175 acres) in southern Orange County. The watershed includes portions of the cities of Aliso Viejo, Lake Forest, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo and Laguna Beach. The watershed drains for a distance of 16.5 miles in a northeast to southwest direction from the Santa Ana Mountains of the Cleveland National Forest to the Pacific Ocean south of Laguna Beach (SDRWQCB 2001). The Project Site closely parallels Aliso Creek for approximately 4.2 miles, from Alicia Parkway to the CTP. A detailed drainage analysis of the project to determine the potential impacts to the hydrology of Aliso Creek has not been completed.

Groundwater

In January 2009, high groundwater was encountered at Boring 3 (B-3) near station 60; 6.5 feet below ground surface (BGS), according to a Ninyo and Moore Report (April 2009). Groundwater was also encountered in borings B-1 near Station 0 and B-2 near Station 10 at 20 and 25 feet BGS, respectively during the January 2009 investigation. In October 2000,

groundwater was encountered in 13 of the 19 borings. In general, groundwater in the approximate southern half the Project Site ranged from approximately 18.5 to greater than 51.5 feet BGS. Groundwater in the approximate northern half of the Project Site generally ranged between 6 and 30 feet BGS (N&M 200). The depth of the trench excavation will reportedly be approximately 4 feet BGS. The lithology of the alluvium is reported as sandy clay (SC), clay (CL) and silty sand (SM) in the project area. Based on our experience with this type of formation, the same day water level measurements presented in the geotechnical report may not necessarily representative of the actual groundwater table (i.e. when monitoring wells are installed and developed it typically takes 24 hours for the water level to equilibrate). Therefore, portions of the proposed pipeline may require groundwater dewatering.

Based on the fluvial environment of the pipeline alignment, grain size is expected to vary from the finer grained bank and off-channel deposits to coarser grained channel deposits. Depending on the lithology encountered and quantity of water required to dewater a NPDES Permit may be required. If groundwater is proposed to be discharged to surface waters (i.e. Aliso Creek) a *General Waste Discharge Requirements (WDR) for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region (Regional Board Order No. R9-2008-0002)* will be required. As an alternative to obtaining a NPDES dewatering permit, the water could be discharged to the sanitary sewer, or an upland area where it does not enter back into the stream, or used for dust control.

Floodplain

Portions of the proposed pipeline alignment are identified to occur within a Federal Emergency Management Agency (FEMA) Fire Insurance Rate Maps (FIRMs) flood zone susceptible to 100-year and 500-year floods (see Figure 1).

Impaired Downstream Waterbodies

The 2010 CWA 303(d) List of Water Quality Limited Segments classifies Aliso Creek, the mouth of Aliso Creek and the Pacific Shoreline at Aliso Creek as impaired water bodies. The pollutant/stressors and potential sources for these impaired waterbodies are identified in the following table:

TABLE 1
Clean Water Act 303(d) List of Water Quality Limited Segments

Location	Pollutant/ Stressor	Potential Source	Expected TMDL Completion	Estimated Size Affected
Aliso Creek	Phosphorus	Urban Runoff/Storm Sewers, Natural Sources, Unknown Nonpoint Source	2019	19 Miles
	Selenium	Urban Runoff/Storm Sewers, Unknown Nonpoint Source	2021	19Miles
	Total Nitrogen as N	Urban Runoff/Storm Sewers, Natural Sources, Unknown Nonpoint Source	2019	19 Miles
	Toxicity	Source Unknown, Unknown Nonpoint Source, Unknown Point Source	2019	19 Miles
	Indicator Bacteria	Urban Runoff/Storm Sewers, Nonpoint Source, Point Source, Unknown Point Source	2005*	19 Miles
Aliso Creek (mouth)	Indicator Bacteria	Nonpoint Source, Point Source	2019	0.29 acres
Pacific Shoreline, at Aliso Creek Mouth (** and Aliso Beach – Middle)	Enterococcus**	Unknown Nonpoint Source, Unknown Point Source, Urban Runoff/Storm Sewers	2021	0.03 Miles
	Fecal Coliform	Unknown Nonpoint Source, Unknown Point Source, Urban Runoff/Storm Sewers	2021	0.03 Miles
	Total Coliform**	Unknown Nonpoint Source, Unknown Point Source, Urban Runoff/Storm Sewers	2021	0.03 Miles

Source: State Water Resources Control Board, October 25, 2006.

* Regional Boards will update this decision when new data and information become available and are assessed

Urban runoff/storm sewers are a potential source for Phosphorus, Selenium, Total Nitrogen as N, Indicator Bacteria, Enterococcus, Fecal Coliform and Total Coliform in Aliso Creek and at the Pacific Shoreline at the mouth of Aliso Creek. Nonpoint/point sources are not only potential contributors to the aforementioned pollutants, but also to Toxicity within Alison Creek and Indicator Bacteria at the mouth of Alison Creek.

Significance Thresholds

Appendix G of the CEQA guidelines provides that a proposed project may have a significant impact on hydrology and water quality if it results in any of the following conditions. Responses to the questions applicable to the Project Site have been provided in 'boldface' type.

- a) Violates any water quality standards or waste discharge requirements?
No, by adhering to the requirements provided in the Orange County DAMP the project will be in compliance.

- b) Substantially depletes the groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
No, potential project impacts to groundwater will be limited to groundwater dewatering that may be required during installation of export sludge force main. The construction impacts will be short lived and will not result in a prolonged net deficit in aquifer volume or lowering of the local groundwater table.

- c) Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or situation on- or off- site?
No, by adhering to the requirements provided in the Orange County DAMP the project will preserve existing drainage patterns and prevent the development of substantially erosive features.

- d) Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate of amount of surface runoff in a manner which would result in flooding on- or off-site?
No, following Orange County DAMP guidelines, the project will not alter existing drainage patterns nor will it increase surface runoff from the site.

- e) Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff?
No, the project area does not discharge runoff into an existing or planned stormwater drainage system, and in compliance with Orange County DAMP guidelines the project will not produce substantial additional sources of polluted runoff.

- f) Otherwise substantially degrades water quality?
No, by adhering to the requirements provided in the Orange County DAMP the project will be in compliance.
- g) Places housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
No, the project does not propose the development of housing.
- h) Places within a 100-year flood hazard area structures which would impede or redirect flood flows?
The project does not propose any above-ground structures within the 100-year flood plain. Temporary storage and stockpiling areas during construction should be designated outside of the 100-year floodplain.
- i) Exposes people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of a failure of a levee or a dam?
No.
- j) Inundation by seiche, tsunami, or mudflow?
No.

Construction BMPs

The proposed project is larger than 1 acre and therefore will all be required to obtain coverage under the General Construction Storm Water Permit (Construction General Permit Order 2009-0009-DWQ). This includes the development of a SWPPP which provides project specific BMPs for reducing storm water pollution from construction sites. The following is a list of construction BMPs provided in Table 8-7 of the Orange County DAMP (2003). Site specific BMPs will minimize the generation of stormwater and non-stormwater pollutants from construction activities. Scheduling construction activities in the 100-year flood plains during the non-rainy seasons will also reduce the potential for erosion as a result of large rainfall/runoff events.

Erosions and Sediment Control BMPs

- Scheduling
- Preservation of Existing Vegetation
- Hydraulic Mulch
- Hydroseeding
- Soil Binders
- Straw Mulch
- Geotextiles, Plastic Covers and Erosion Control Blankets/Mats

- Wood Mulching
- Earth Dikes/Drainage Swales and Lined Ditches
- Outlet Protection/Velocity Dissipation Devices
- Slope Drains
- Silt Fences
- Desilting Basins
- Sediment Traps
- Check Dams
- Fiber Rolls
- Gravel Bag Berms
- Street Sweeping and Vacuuming
- Sandbag Barriers
- Straw Bale Barriers
- Storm Drain Inlet Protection
- Wind Erosion Control
- Stabilized Construction Entrance/Exit
- Stabilized Construction Roadway
- Entrance/Outlet Tire Wash

Non-Stormwater Control and Waste Management/Materials Pollution Control BMPs

- Water Conservation Practices
- Dewatering Operations
- Paving and Grinding Operations
- Temporary Stream Crossing
- Clear Water Diversions
- Illicit Connection/Illegal Discharge Detection and Reporting
- Potable Water/Irrigation
- Vehicle and Equipment Cleaning/Fueling/Maintenance
- Pile Driving Operations
- Concrete Curing/Finishing
- Material and Equipment Use Over Water
- Structure Demolition/Removal Over or Adjacent to Water
- Temporary Batch Plants
- Streambank Stabilization
- Material Deliver and Storage
- Material Use
- Stockpile Management
- Spill Prevention and Control
- Solid Waste Management
- Hazardous Waste Management

- Contaminated Soil Management
- Concrete Waste Management
- Sanitary/Septic Waste Management
- Liquid Waste Management

Summary

Based on Dudek's review of the Project Site, hydrologic impacts are expected to be minimal. The proposed subgrade project will not change the surface cover or land use in the area, and the implementation of construction BMPs will minimize hydrologic impacts. Final construction BMP recommendations will be provided in a Construction SWPPP developed prior to project implementation. The *WDR for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region (Regional Board Order No. R9-2008-0002)* may be required for portions of the proposed pipeline if significant quantities of shallow groundwater are encountered that cannot be discharged in another manner (e.g. sanitary sewer or dust control).

References

Ninyo and Moore (N&M). 2009. Preliminary Geotechnical Evaluation Coast Treatment Plant Access Road Realignment Study, SOCWA. April 24, 2009.

N&M. 2000. Geotechnical Evaluation Moulton Niguel Water District Aliso Creek Emergency Sewer, Laguna Niguel, California. December 19, 2000.

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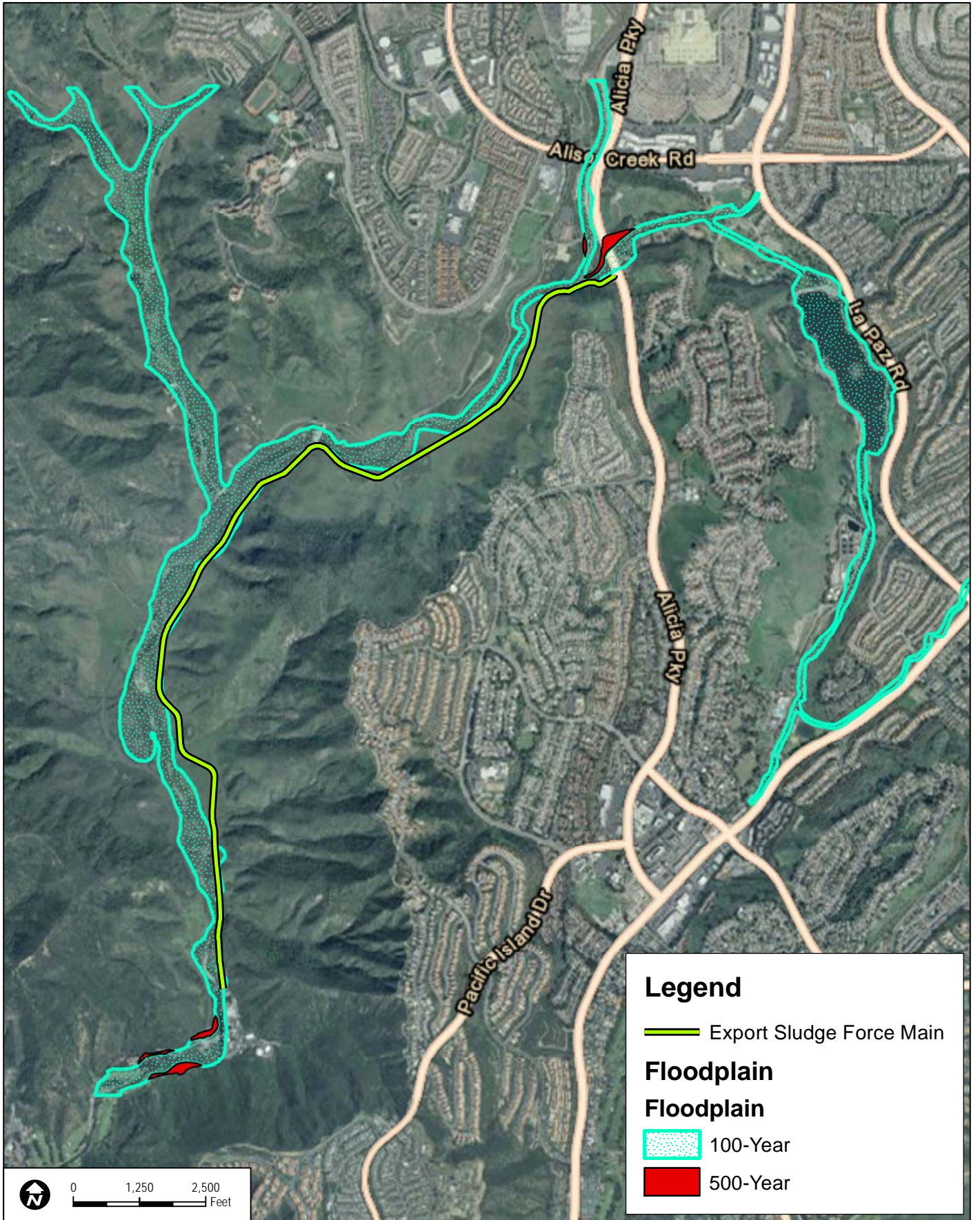
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San Diego Regional Water Quality Control Board (RWQCB). General Waste Discharge Requirements (WDR) for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region (Regional Board Order No. R9-2008-0002).

http://www.swrcb.ca.gov/sandiego/board_decisions/adopted_orders/2008/2008_0002.pdf



Legend

— Export Sludge Force Main

Floodplain

Floodplain

100-Year

500-Year

0 1,250 2,500 Feet

DUDEK

SOURCE: ESRI World Imagery

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Coastal Treatment Plant Export Sludge Force Main Project, Aliso Creek, SOCWA

FIGURE 1
FEMA Floodplain Boundaries

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