Appendix E3

Addendum No. 1 to the Preliminary Geotechnical/ Geologic Evaluation

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GeoPentech

December 13, 2022, Rev. February 15, 2024

Project No. 21004A

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SUBJECT: ADDENDUM NO. 1 - Preliminary Geotechnical/Geologic Evaluation for the Pure Water Conveyance Program (formerly Regional Recycled Water Supply Program), Dated September 6, 2018

This addendum provides an update to the preliminary desktop geologic and geotechnical evaluation report that was prepared for Metropolitan Water District of Southern California's (Metropolitan's) Pure Water Southern California (Pure Water) conveyance alignment alternatives. The report was provided as a draft September 6, 2018 (referenced herein as the 2018 Geotechnical Evaluation report). This addendum update focuses on the current proposed Pure Water conveyance alignment that is favored and extends from the Advanced Water Treatment Plant in the City of Carson to near the mouth of San Gabriel Canyon in Azusa. The current favored alignment (backbone alignment) is shown on Figure 1 and passes through the cities of Carson, Long Beach, Lakewood, Cerritos, Bellflower, Norwalk, Downey, Santa Fe Springs, Pico Rivera, Whittier, Industry, Baldwin Park, Irwindale, Duarte, Azusa, and unincorporated Los Angeles County.

The alignment provided in the 2018 Geotechnical Evaluation report for the Pure Water conveyance alignment alternatives approximately coincided with the current backbone alignment, except for the approximate 3-mile-long segment that was added north of the Santa Fe Dam and Spreading Grounds (SFDSG). This additional segment was included to allow discharge to the San Gabriel Canyon Spreading Grounds near the mouth of San Gabriel Canyon (see Figure 1). Therefore, the geologic and geotechnical conditions presented in the 2018 report are relevant to the current alignment that is shown on Figure 1. These conditions included anticipated geology, Quaternary faults and Alquist-Priolo (AP) Act designated fault zones, seismic hazards consisting of liquefaction and seismically induced landsliding, areas of shallow groundwater, oil and gas fields, and the anticipated soil characteristics along the alignment.

As shown on Figure 1, and as previously identified, the backbone alignment is predominantly within mapped liquefaction hazard zones and crosses the projection of the historically active Newport-Inglewood fault in the Dominguez Gap and the Whittier Fault in the Whittier Narrows. The segment of the current alignment that extends north of the SFDSG overlies a mapped liquefaction zone and crosses a segment of the AP zoned Sierra Madre fault. The backbone alignment does not cross areas where seismically induced landslides are mapped.

As indicated in the 2018 report, shallow soils (less than 20 feet in depth) throughout the conveyance project area are primarily composed of sand, silt, and clay. Soils deeper than 20 feet in depth tend to be coarse grained (sand, gravel, cobbles, and boulders) in the northern portion of the alignment (north of the

City of Downey) and finer grained to the south consistent with alluvial and fluvial deposition that is sourced from the San Gabriel mountains to the north. Expansive soils (Plasticity Index >20) may be present at discrete locations along the alignment. It is noted that Metropolitan borings drilled for construction of their Second Lower Feeder, which is to the south of the current favored Pure Water conveyance alignment, encountered soil identified as “Gumbo silt” between the San Gabriel and Los Angeles rivers. Our experience at other projects in this area suggests that fine-grained sediments would be appropriate for reuse. However, “Gumbo silt” would not be reusable based on the textural descriptions in the Metropolitan boring logs. Increased cost for imported backfill material should be included in cost estimates for areas where “Gumbo silt,” or highly plastic soils are identified. In general, the planned pipeline trenching would have minimal effect, if any, on expansive soils in areas where unsuitable soils of this nature may exist outside the limits of planned construction. Within the limits of the planned construction, over excavation of unsuitable soil, including expansive soils, and replacement with engineered fill is a common construction practice used to prepare a stable base for planned structures, including pipelines.

The identified soil types, groundwater conditions, and geologic hazards along the favored backbone alignment will influence the open trench and trenchless construction means and methods. Engineering solutions are available to accommodate the soil and groundwater conditions, and geologic hazards identified along the alignment. The geotechnical considerations provided in the 2018 report are also applicable to the current favored backbone alignment, specifically the recommendations and examples provided for temporary shoring, excavation and soil reuse, dewatering, bearing capacity for pipe jacking, liquefaction, fault offset, and chemical and gassy conditions associated with known oil and gas fields. In addition, areas where possible ground deformation is identified due to liquefaction or faulting, special pipe segments or connections could be designed and used to accommodate the estimated pipe demands. Soil anchors or weighting could be used to prevent potential pipe flotation due to liquefaction. Where trenchless pipeline construction is planned in areas where potentially gassy ground is identified, such as overlying oil and gas fields, positive air ventilation and explosion-proof equipment would be required during construction. Where construction equipment such as cranes or jacking equipment require higher soil bearing capacity, ground improvement could include, for example, over excavation and replacement with engineered fill, or use of soil-cement mix.

The geotechnical conditions evaluated in the 2018 report and presented in this revision with the current favored backbone alignment are based on published literature, government agency websites and GeoPentech’s in-house records. The compiled data reviewed and relied upon for the geotechnical evaluation are consistent with our geologic and geotechnical understanding of the conditions along the favored alignment. The compiled data are from reputable sources such as peer-reviewed literature, the California Geological Survey, and the U.S. Geological Survey. Field investigations have not been conducted by GeoPentech for this initial phase of work to independently confirm the reported site geotechnical conditions due to the preliminary nature of the evaluation.

As the project progresses towards design, we recommend conducting site-specific geotechnical data gathering that should include extensive geotechnical investigation, testing and evaluation focused on the planned pipeline construction methods (i.e. open trench or trenchless). Geological hazards such as liquefaction, lateral spreading and fault deformation will require specialized explorations, including evaluation of soil types, in-place density and distribution, and depth to groundwater. Fault crossings will require fault-specific investigations that could rely upon field investigations using geophysical methods, subsurface explorations including drilling and soil sampling, and fault displacement hazard analyses using documented fault activity data.

GENERAL CONDITIONS

This letter is subject to the same general conditions as those indicated in our geotechnical/geologic evaluation report dated September 6, 2018.

Thank you for providing GeoPentech the opportunity to participate in this project. If you have any questions or require additional information, please contact us.

Very truly yours,

GeoPentech, Inc.

Eric L. Fordham

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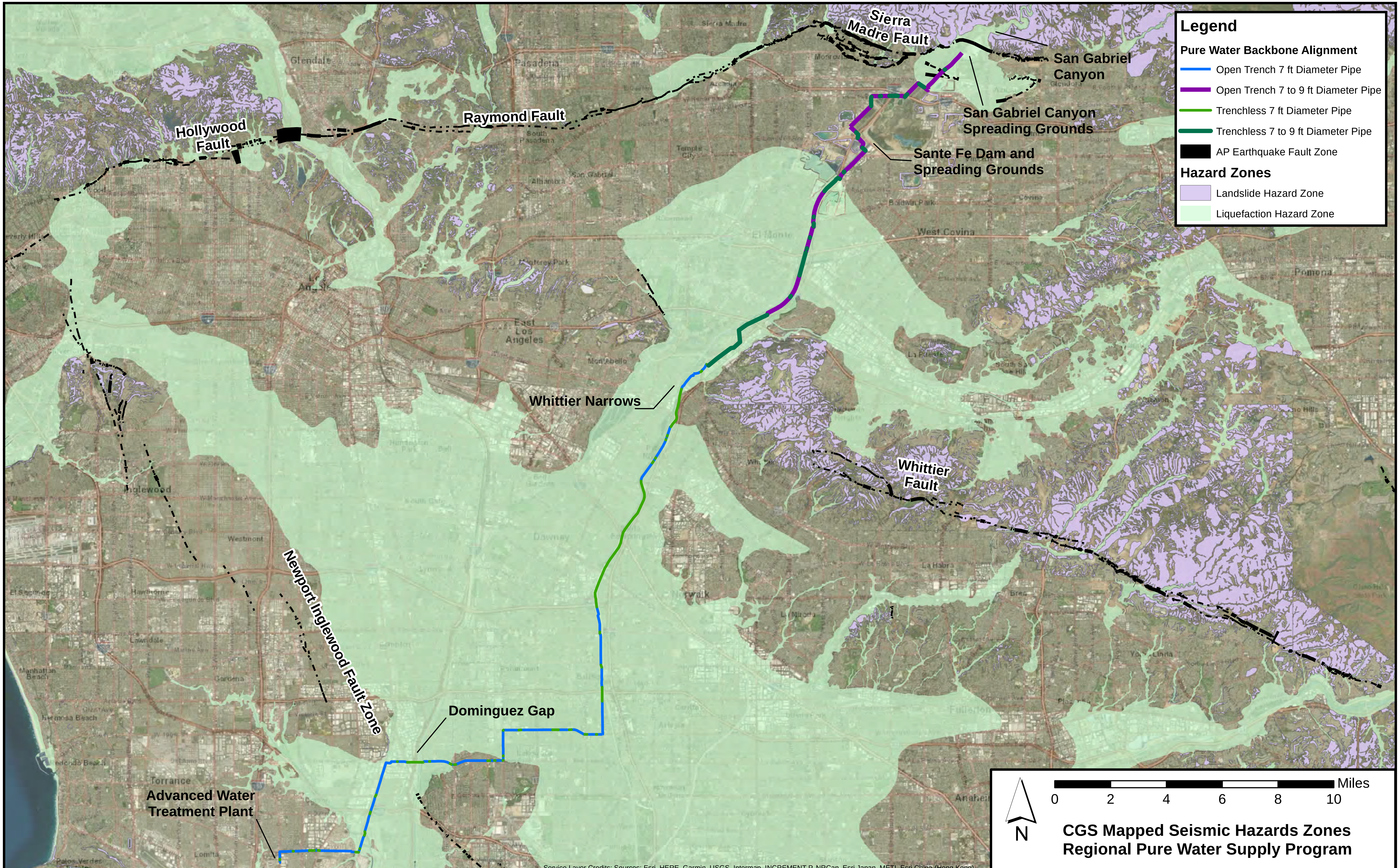
Principal Engineering Geologist



CGS Mapped Seismic Hazards Zones
Regional Pure Water Supply Program

GeoPentech	Proj. No. 21004A	DEC 2022	Figure 1