Memorandum

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To: **File**
From: Marc Traut
Date: 12-22-2016

Subject: Cabrillo Oil Field Pipeline Options and Economic Feasibility

Ventura County (VC) Planning has requested that RenPet provide a discussion on the economic feasibility of transporting Cabrillo Oil Field (Cabrillo) crude oil from the field's Naumann Drillsite to market by way of a pipeline instead of by tanker truck. This request has been made to assess whether RenPet's activities at the Naumann Drillsite are consistent with the oil development guideline standards that are defined in the Ventura Non-Coastal Zoning Ordinance (VCNCZO) Section 8107-5.5. Importantly, the aforementioned reference states that these guidelines shall be "…applied whenever physically and economically feasible and practicable…." The guidelines include Section 8107-5.5.5.a that states "…Pipelines should be used to transport petroleum products off-site to promote traffic safety and air quality…." The following is RenPet's response to the request made by VC Planning.

Cabrillo crude oil has historically been transported by truck from the processing and storage hub for Cabrillo, which is the Naumann Drillsite located on Etting Road in the southern sector of the Oxnard Plain. From the Naumann Drillsite, the transportation route is by various VC roads north to SR 101 and then south to refineries in the Carson/Torrance area of southern California. Section 4.2.6 of the current version (10-20-2015) of the Ventura County General Plan, Public Facilities and Services Appendix (VC General Plan) provides a general discussion of the existence of oil pipelines in Ventura County. Not included in the current version of the VC General Plan is a map showing the location of these oil pipelines. Maps of oil pipeline locations had been included with earlier versions of the VC General Plan (i.e.1987). RenPet was able to locate a report prepared for the Ventura County Grand Jury in 2015 that included a map of oil pipelines within VC. The report was prepared to address concerns over pipeline safety within VC following the pipeline rupture and ensuing oil spill in Santa Barbara County in 2015. A copy of the pipeline map included with the VC Grand Jury report is attached to this memo. Oil pipelines are shown as solid red lines. Also attached to this memo is an enlargement of the same map that shows the location of oil pipelines in relation to the Naumann Drillsite.

The enlargement of the VC pipeline map shows the location of three oil pipeline interconnection possibilities that represent the nearest options for RenPet to interconnect Cabrillo to the existing oil pipeline system. These interconnections are considered possibilities. RenPet has never had contact with any of the pipeline owners to explore if pipeline access is feasible and to determine what the tariff would be for pipeline access and crude oil transport. Each of these three options is described in the following:

- Oil pipeline interconnection Option 1 is approximately 8.1 miles from the Naumann Drillsite. The interconnection point is at the intersection of Los Angeles Avenue (SR 118) and Santa Clara Avenue. The oil pipeline is owned and operated by Crimson and serves to transport crude oil east and ultimately south from the Ventura Avenue Oil Field area to Los Angeles area refineries.

- Oil pipeline interconnection Option 2 is approximately 6.6 miles from the Naumann Drillsite. The interconnection point is at the intersection of Santa Clara Avenue and Central Avenue. The owner of the pipeline is unknown; however that oil pipeline serves the Santa Clara Avenue Oil Field and interconnects with an oil pipeline that was formerly owned by Union Oil Company that transports crude oil eastwards along the Santa Clara River and ultimately south to Los Angeles area refineries.

- Oil pipeline interconnection Option 3 is approximately 10.6 miles from the Naumann Drillsite. The interconnection point is west of Harbor Boulevard in the vicinity of the Mandalay Beach generating plant. The owner of the pipeline is unknown; however that oil pipeline serves the West Montalvo Oil Field and appears to interconnect with the same oil pipeline that was formerly owned by Union Oil Company that transports crude oil eastwards along the Santa Clara River and ultimately south to Los Angeles area refineries.

All three of the oil pipeline interconnection options for Cabrillo that are shown on the attached enlargement face challenges. For Options #1 and #2, the largest hurdle is an undercrossing of SR 101. For options #1, #2 and #3, the Cal Trans, VC, and city of Oxnard road right-of-ways could be used for pipeline placement as the routes would use common segments of Etting Road, Rice Road, and Santa Clara Avenue. Interconnection Option #3 would use part of the same right-of-way as options #1 and #2, but would cut west through the city of Oxnard, and then into the VC Coastal Zone, and then north and west to the possible interconnection point in the vicinity of Mandalay Beach.

Based on pro forma cost estimates, the three oil pipeline interconnection options described above would cost 1.2 to 1.5 million dollars per mile. The estimated average cost for the three options is 11.4 million dollars for permitting, design, engineering, and construction. The necessary lead time for any of these options would be 4 to 5 years.

The economic feasibility of any pipeline project would be based on the differential savings between the cost of transporting Cabrillo oil by pipeline versus the cost of transporting Cabrillo oil by tanker truck after consideration of the capital investment of pipeline construction. RenPet pays approximately $2.50 per barrel to transport its Cabrillo crude oil from the Naumann Drillsite to markets in southern California. An estimated tariff to transport Cabrillo crude via pipeline is $0.50 per barrel. The estimated net savings realized by utilizing a pipeline for crude oil transport instead of truck transport is $2.00 per barrel.

Cabrillo crude oil has been trucked from the Naumann Drillsite from inception of activities there in 1992. The highest rate of production achieved to date for Cabrillo was a rate of approximately 12,500 barrels of oil per month beginning in late 2010. The production rate declined rapidly. Cabrillo oil production is currently approximately 1800 barrels of oil per month. The exponential decline over the past five years is typical for the Cabrillo reservoir.

A discounted cash flow analysis was performed to determine the net present value (NPV) of a hypothetical Cabrillo pipeline project on a go forward basis, that is, from the current level of production forecasted out for 25 years. The assumptions are as follows:

1. Pipeline Capital Investment: $11,385,000
2. Net Crude Transportation Savings per barrel: $2.00
3. Discount Rate: 5%
4. Project life: 25 years; years 6-31
5. Future production decline: Exponential ($y=80221x^{-0.673}$)

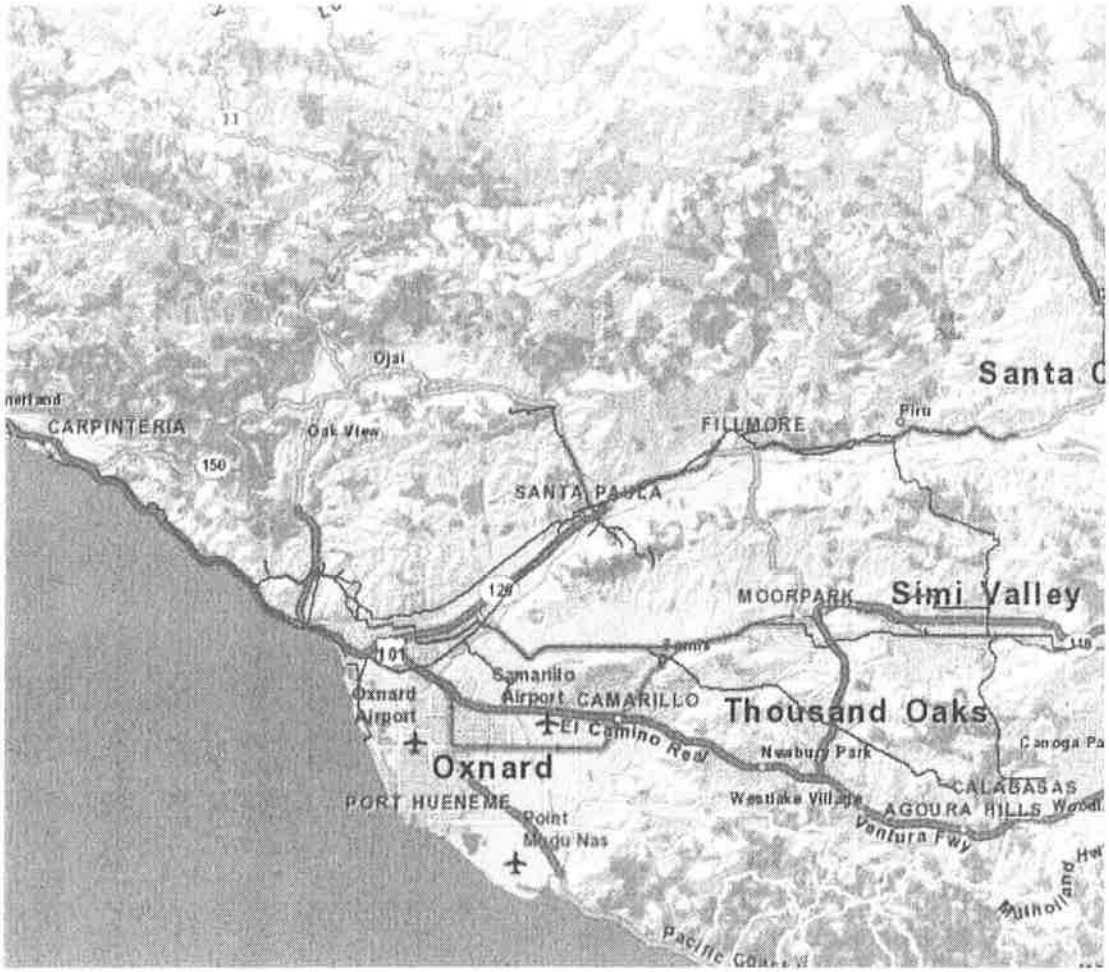
The NPV of the pipeline project with the above assumptions is ($10,512,490).

A second discounted cash flow analysis was performed to determine the NPV of a hypothetical Cabrillo pipeline project on the basis of a restart of the Cabrillo production rate achieved in 2011 as a starting point and then declining out for 25 years. The assumptions are as follows:

1. Pipeline Capital Investment: $11,385,000
2. Net Crude Transportation Savings per barrel: $2.00
3. Discount Rate: 5%
4. Project life: 25 years; years 1-25
5. Future production decline: Exponential ($y=80221x^{-0.673}$)

The NPV of the pipeline project with the above assumptions is ($10,176,737). Note that there is a slight improvement in NPV over the first analysis, as a result of the addition of an early period of higher initial production rates. Nonetheless, the pipeline project is still completely uneconomic. To meet basic financial criteria for the project to be considered economically feasible, the NPV would have to be no less than $0 which equates to a 5% rate of return on the original capital investment.

A third discounted cash flow analysis was performed as a sensitivity to the second case to determine the initial annual production rate required to drive the NPV to $0. The assumptions were the same as the second case above. The initial annual production rate required to drive the NPV to $0 is 1,305,808 barrels of oil. This hypothetical volume is more than 16 times the previous annual Cabrillo production rate peak of 80,221 that was realized in 2011. This sensitivity serves to demonstrate the extremely large volume of oil production required to begin to enter a discussion regarding a Cabrillo pipeline interconnection. Until other options become available, a pipeline project as described above to transport Cabrillo crude oil from the Naumann Drillsite by pipeline is not economically feasible or justifiable. As a result, RenPet's plan for Cabrillo and the Naumann Drillsite is to continue to transport Cabrillo crude oil by tanker truck.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MOORPARK
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CAMARILLO
Thousand Oaks
Oxnard
Airport
El Camino Real
Newbury Park
Oxnard
PORT HUENEME
Point
Mugu Nas
Westlake Village
CALABASAS
AGOURA HILLS
Ventura Fwy
Mulholland
Pacific

Map Source:
Ventura County Grand Jury 2015-2016 Final Report Ventura County Crude Oil Pipelines - April 12, 2016, pg. 18