



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alvin Kristoff E. Agatep</b>	<b>Project Number</b> <b>S1101</b>
<b>Project Title</b> <b>An Analysis of the Effect of Effluent on the Water Quality of the Santa Ana River</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this project was to determine the water quality of the Santa Ana River as a result of the effluent flowing through the water treatment plant located next to the river in Riverside. Much knowledge of the actual quality of the water would be derive through a series of tests from water quality test kits.</p> <p><b>Methods/Materials</b> Water test kits, water bottles, water scoop contraption, journal, and writing utensils. Water test kits of the various quality factors varied from portable spectrophotometers, titration apparatuses, and simple measuring devices. 3 tests were conducted at the 4 predetermined sites over a course of three months beginning from the end of November to the beginning of February. Sites were determined based on the influence of effluent on the water's quality.</p> <p><b>Results</b> Water from test sites 1-4 had relatively similar levels for temperature, chloride concentration, total dissolved solids, alkalinity, dissolved oxygen, hardness, carbon dioxide, and salinity. Notable results were that oh pH, nitrate, and phosphate. Where water was located in site 3 (effluent mix) and site 4 (river water; no mix), the water seemed to be just a tad bit basic with pH values between 7.09 and 7.46. Nitrate levels were significantly low in sites 1 and 2(effluent water), where levels in these sites were from 2.8 ppm and below. Sites 3 and 4 had values from 7 ppm up to 8.2 ppm. Finally, phosphate levels in site 1 (effluent water) had higher levels of phosphate (2.5 ppm) compared to the other sites, with their values being lower than 2 ppm.</p> <p><b>Conclusions/Discussion</b> With high levels of alkalinity, hardness and TDS levels coming from all sites , it was fully determined that the water from the Santa Ana River was not drinkable. This was reassured by levels indicated by the EPA, which demonstrated that the levels found from these tests highly surpassed the safe consumption rates. Although exposure to these high levels does not affect one's physicality, through experimentation and was concluded that with the the very low concentrations of nitrate and high concentrations of phosphate, the water was indeed safe to partake in recreational purposes.</p>	
<b>Summary Statement</b> Through a series of water tests, I have found that the water in the Santa Ana River affected by the effluent was not drinkable but safe to recreationally swim in.	
<b>Help Received</b> I was given help by my advisor and chemistry teacher, Michelle Hampton, who provided me with all the water test kits.	