

---

---

## MEMORANDUM

---

---

**TO:** EILEEN CASHMAN  
**FROM:** JENNIFER BARRANCO  
**SUBJECT:** ARCATA MARSH TRIP  
**DATE:** OCTOBER 7, 2016  
**CC:** KYLE SIPES

---

### **PURPOSE**

The purpose of this memorandum is to offer a reflection of the ENGR 115 Trip to the Arcata Wastewater Treatment Plant held on September 30, 2016. An overview of the tour is included.

### **DISCUSSION**

The trip to the Arcata Wastewater Treatment Plant consisted of a tour led by Thea Sevelson, the operator of the plant. Thea discussed the plant's four major types of treatment, as well as the multiple process that makes up each treatment.

The tour began with the headworks process of the primary treatment. In this part of the tour, Thea informed us of how the process works. The wastewater was carried upwards through the use of Archimedes screw pumps, and it then flows through the bar racks through the effects of gravity and into the grit chamber. Thea mentioned the difficulties that certain types of solids bring to the performance of the headworks. Solids outside of the normal excrement and paper products (such as condoms, wipes, feminine products, etc.) often get stuck in the machinery and thus require the manual removal of such solids.

After the headworks, the wastewater continued into the primary clarifier where the flow was slowed down in order to allow for the settling of solids. The solids that settled to the bottom of the clarifier were then removed with a rotating sludge raking system. Similarly, the solids that floated to the surface of the tank were removed with a rotating rake skimming system. The sludge that was removed from the clarifier was then sent to the anaerobic digester.

After discussing the primary treatment and its multiple process, we continued toward the oxidation ponds and wetlands which comprised the secondary treatment of the plant. Thea informed us that after going through the primary treatment, the wastewater flows into the oxidation ponds; these ponds take the organic material from the wastewater and incorporate it into the bacteria cells that settle to the bottom of the pond. The wastewater then flows into the wetlands, where BOD, nitrogen, and phosphorous are removed (among other things).

From the wetlands, some of the water is chlorinated and dechlorinated before being sent to the enhancement marshes, a process in the tertiary treatment of the plant. The enhancement marshes continued to remove the BOD from the wastewater, as well as lower the nitrogen and phosphorous levels. Lastly, Thea described the disinfection treatment of the plant. This treatment involved mixing the effluent from the wetlands with water returning from the enhancement marshes; the mixed effluent was then chlorinated to remove bacteria and pathogens. A portion of this water was then allowed to flow back to the enhancement marshes, while the rest was dechlorinated for release into the Humboldt Bay.

### **CONCLUSION**

The trip to the Arcata Wastewater Treatment Plant allowed the ENGR 115 class to witness firsthand the wastewater treatment process discussed in class. From this experience, we were able to get a better, real-life perspective on the process behind the treatment of our wastewater.