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## INTEROFFICE MEMORANDUM

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**TO:** EILEEN CASHMAN AND KYLE SIPES  
**FROM:** ALEXANDER FARMELO  
**SUBJECT:** ENGR 115 ARCATA WASTE WATER TREATMENT PLAN FIELD TRIP  
**DATE:** SEPTEMBER 30, 2016

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### Purpose

The purpose of this memo is to discuss the ENGR 115 field trip to the Arcata waste water treatment plant. We visited the plant to learn about how water is treated in Arcata and identify some of the problems that the treatment plant is facing. The Arcata marsh is a critical asset to the community. Its design is progressive regarding sustainable water treatment due to its integral use of treatment wetlands. Thus it is a valuable for an Environmental Resources Engineering class to observe a functioning treatment plant.

### Discussion

On the tour we, learned about how water is treated with a main focus on primary through tertiary treatment. We learned that on an average day, the Arcata wastewater treatment plant may take in 2.3 million gallons of water. During the winter months when it rains, this can increase up to 14 million gallons per day due to leaking pipes. Summer months can see as low as 1 million gallons per day when HSU students aren't present. Coming into the plant, the wastewater BOD can fall between 200 mg/L and 250 mg/L. It will then fall between 60 mg/L and 100 mg/L after primary treatment. Finally, the water that leaves the treatment plant is required to be below 30 mg/L average over the course of a month and never go over 60 mg/L.

After waste is settled in primary treatment, sludge is removed from the primary clarifiers and placed into an anaerobic digester. The methane produced heats the digesters and the rest is flared off. Some of the treated solids are then sent to a drying bed and made into compost.

The wastewater then moves from the anaerobic digesters to oxidation ponds and then treatment wetlands. The process of the treatment wetlands is to lower further lower BOD thus processing organic solids through both aerobic and anaerobic processes. To keep the smell down, Algae is allowed to grow and photosynthesize oxygen for the bacteria to consume. Unfortunately, a layer of sludge has been building up at the bottom of the treatment wetlands. "Blue Frogs" have been added to some treatment wetlands to try and suspend the sludge for it to be broken down by bacteria. The blue frogs have been largely successful in reducing the amount of sludge and may be a more sustainable and cost effective method of dealing with the sludge compared to dredging it out.

### Conclusion

This field trip was very informative regarding how a treatment plant works in real time. Being able to talk with the people that have firsthand experience regarding the Arcata wastewater treatment plant really brings to life some of the challenges that are faced as well as some of the more

specific procedural aspects of the plant. It was an eye opening experience to see all of these processes at work.