Internship with Bear River Health Department in maintenance of Water Systems

Kaden Bunch
Utah State University

Introduction

Over the past months I have been part of an internship with the Bear River Health Department Water Division. During my time with them I've had the following responsibilities;

- **Public Water System maintenance;** I measure chlorine and bacterial levels in water systems in Rich, Box Elder, and Cache County.
- **Public Pool & Spa Maintenance;** I measure chlorine, and pH levels in pools as well as quantify coliform levels to make sure they are beneath the threshold allowed by Utah.
- **Data structuring;** I record and upload information on the systems I sample which is then uploaded to the state to be archived.

Overall, there are roughly 300 different sites I am assigned to sample and maintain all of which need to be done routinely each month.

Table 1- Monthly samples required by each county

County	Water System Samples	Pool/Spa Samples	Total
Rich County	12	14	26
Box Elder County	14	25	39
Cache County	116	96	212
Totals	142	135	277

Methods

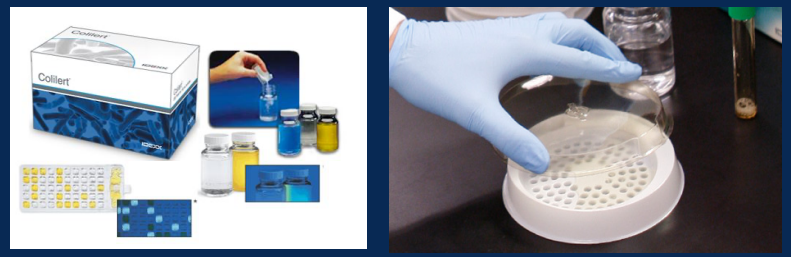
I take the following the following steps which each sample taken;

1. The sample Chlorine and pH level is taken
2. The water is then collected in a 50 mL bottom
3. At the lab the water is converted into a bacteria broth and incubated for 24 hours to see if there is bacteria present and growing
4. If the sample is from a pool water is used to create a MPN test to quantify bacteria quantities

Results

After the samples have been incubated the data is recorded and emailed to the owners and uploaded to the state's system format where it is recorded for use by the government in regulating the water systems of the state

Figure 1 – incubation of water samples



Addition of Colilert to water samples to create a bacteria broth which after incubation will turn yellow in the presence of bacteria

Figure 2 – HPC Quantification table

	Microbiological indicators					
	FC		*HPC*		*Ente*	*Ps*
	Not acce	*Acce*	*Not acce*	*Acce*	*Not acce*	*Acce*
	31	91	48	81	57	100
	20.4	65.5	34.5	58.7	41.3	72.5
	33	57	45	66	36	81
	27.3	55.9	44.1	64.7	35.3	71.7
	21	47	15	40	22	56
	21.2	75.8	24.2	64.5	35.5	73.7

HPC quantities accepted and not accepted after 48-72 hour incubation

Conclusions

By routinely sampling these water systems and pools it allows for all the following to be accomplished;

1. Prevention of bacteria build up in water systems and public pools/spas ensuring safety
2. Providing the state with the sample results of the cities water systems allows for the local governments to receive more funding for maintaining clean water systems

Utah State University

Kaden Bunch
Utah State University
Department of Biology
Kaden.Bunch@aggiemail.usu.edu