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# The Grain Mill

Publication of the Scioto, Olentangy and Darby Zymurgists, Inc.

April 2001

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## President's Corner

*by Mark Irwin*

Probably the biggest event for the club in the past month was the brewing of Ken's Alt over at the Smokehouse a week and a half ago. Scott put Ken and Stacy through a hard day's work, but one they enjoyed. Being able to sample a small amount (or maybe it was a large amount) of the Russian straight of the filter on its way to the serving tank will tend to help with day's enjoyment. When I was over there on Friday, there was still activity in the blowoff tube off fermentor 4, so the beer is still working away. The date for the unveiling party still needs to be decided, but it will probably be either in late April or in early May. Since the beer is still working, maybe May will be more likely. More information will be coming when it's available.

I just found out (thanks AJ), that

there was a typo in the e-mail I sent everybody about the buffet for this month's meeting. In the p.s., I had mentioned that Mark Katona and I would be brewing our currently unnamed Barley Wine over at Ale House #1. However I got the day wrong. We will be brewing the beer on Tuesday the 10<sup>th</sup>. Assuming that all goes well, the Barley Wine, along with Bill's and Chris' Russian, should go on sale June 10<sup>th</sup> at the Afternoon with the Brewers. I guess I shouldn't send messages like that after driving to Cincinnati at 8 in the morning, sampling beers at Listermans, and then driving back to Columbus.

It's with great sadness that I need to report on changes in the local brewpub scene. Near the end of last March, Hoster's shut the door on their restaurant. On the pleasant side however, I understand the brewery is staying open and those of you that enjoy Victor's and Walter's beers should be able to find them around town. I've also heard a rumour that they brewed the Maibock this year and there might be an opportunity to do an alternative Cinco de Maibock event this year. I also understand that the current owners are looking for somebody to take over the restaurant, so hopefully that will happen quickly. Another loss occurred with the closing of Bunky's in February. I haven't heard (CONTINUED next page)

### Mark Your Calendar...

**APRIL 12** SODZ Meeting 7:00 pm, Barley's Smokehouse

**MAY 12** SNOB's Brewpub Crawl & Homebrew Fest

**JULY 21** Ohio State Fair Homebrew Competition

## SODZ INFO

The Scioto, Olentangy and Darby Zymurgists, Inc. (SODZ) meets on the second Thursday of each month usually at Barley's Smokehouse, Dublin Road, Columbus, Ohio.

Meetings begin at 7 p.m.

Membership dues are \$20 per year and are renewable during the member's anniversary month of joining SODZ. Dues may be mailed to:

Eric Drake (Treasurer)  
2821 Hiawatha St.  
Columbus, OH 43211

Members receive The Grain Mill, the club's monthly newsletter. Articles submitted for the newsletter and should be received no later than May 1st for next month's issue and may be submitted by e-mail, preferably in MSWord, to markrichards@columbus.rr.com or on disk in MSWord.

Current SODZ Officers are:

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**PRESIDENT'S CORNER** (continued)  
any details on possible plans with that location. The group of us that made the road trip out to Newark in early February got lucky with our timing.

Let me thank Eric Drake on behalf of the club for the work he did this past year as the club treasurer. I also need to welcome Herb Bresler to the executive as Vice President and Program Director. If you have any ideas for future meeting topics or club activities please forward them to Herb.

Speaking of club activities, it's getting to the point where we need to start planning this year's Club Brew and Picnic, assuming of

course that we wish to do these again this year. If anyone is willing to host us for either of these two events, please speak up. Also we need ideas for what to brew this year plus somebody to take charge of the brew. For those of you who are new to the club, the Club Brew is an opportunity for newer brewers to observe how an all grain batch is done and for the more experience brewers to see the tricks and techniques of other brewers in the club. We usually do this in late May or early June. Then usually in July, we have the annual picnic where the current year's beer (or beers) is unveiled for the first time.  
---See you all on the 12<sup>th</sup> at the Smokehouse.

## State Fair Competition News

I recently heard from Brett Chance informing me that there has been lots of interest in helping out at the State Fair competition from club members. Right now it looks like he has had more people sign up as stewards than we will probably need so it looks like that we won't need more help there. We are almost surely looking for more judges however, so if any of you would be interest in giving that a try, please contact Brett or me for further information.

Also Brett has sent out the entry information for this years competition. It was sent to everybody in the club plus people who have entered in the past. If you haven't received it yet, or have a friend who would like to enter, please contact Brett to receive the entry package. Brett can be reached by email at b.chance@expo.state.oh.us or by phone at his State Fair office at 644-4126.

# A Homebrewer's Dream Come True

By Ken Wagner

Let me start by saying thanks. Thanks to Scott Francis and Lenny Kolada for giving the club the opportunity to brew at the Smokehouse and thanks to the club for picking my Alt. Brewing at this scale was a lot of fun. I hope everybody gets to try it some day.

Everything started with scaling up my 5 gallon recipe to 11.5 barrels (a factor of about 70x). This was probably the most challenging part of the entire process. Calculating the grain bill isn't too difficult as long as you have an idea of the efficiencies of the two systems. The only other factor that has an impact here is the rule that whole bags of grain should be used wherever possible. The hops are the tricky part. In this case the utilization of neither my homebrew setup nor Scott's setup at the Smokehouse was known. Plus, it is difficult to determine the effect of the whirlpool and rest process Scott uses at the end of the boil relative to my process of chilling immediately after the boil.

Thankfully, I had AJ's help in scaling up the recipe. AJ used his brewing software and factored in information he had from when he and John brewed at the Smokehouse last year. I am grateful that I didn't have to break new ground here.



## 5 Gallon Recipe

7 lbs. Durst Munich 40 EBC (70%)  
2 lbs. Muntons Pale (20%)  
1 lbs. Aromatic (10%)

1 oz. Norther Brewer (whole leaf, a=7.5) for 60 min.

1 oz. Hallertauer (whole leaf, a=4.2) for 40 min.

0.5 oz. Hallertauer (whole leaf, a=4.2) for 20 min.

## 11.5 Barrel Recipe

495 lbs. Durst Munich 40 EBC (68%)

165 lbs. Muntons Pale (23%)

70 lbs. Dewolf-Cosyns Belgian Aromatic (9%)

57 oz. Northern Brewer (pellets, a=6.6) for 60 min.

57 oz. Hallertauer (pellets, a=3.5) for 60 min.

39 oz. Hallertauer (pellets, a=3.5) for 20 min.

Things started the night before brew day with Scott filling up the brew kettle and starting to heat the water. We were ready for mash-in when we arrived at about 9:30am.

Scott doesn't have a mill at the Smokehouse so all of the grain has to be pre-crushed. The Munich and Pale malts were crushed by the supplier. Nina had to crush the 70 lbs. of Aromatic at the Winemakers Shop (thanks Nina!).

Mashing in was very similar to my process at home. Scott filled the mash tun with about 8 bbls of 169F water. Once all of the water was in, the grain was added. Some brewpubs have screw driven con-

veyors to load the grain into the mash-tun and motorized paddles to stir the mash. That's not the case at the Smokehouse. Each bag of grain has to be carried up the platform and dumped in by hand while the mash is manually stirred with a stainless steel paddle. Stirring the mash was kind of like paddling a canoe on a 170F lake.

After dough-in was complete, it was on to some other tasks. First up was to clean a fermenter. The fermenter would serve two purposes. First, it would be used as a hot liquor tank for the sparge water. Then, when the brew was finished, it would be used as the fermenter. Cleaning involved putting in some hot water with a sanitizing solution and recirculating the liquid through a spray ball at the top of the fermenter. The process also served to clean the hoses that would later be used to transfer the beer from the kettle to the fermenter.

Once the fermenter had been cleaned and rinsed, the sparge water was transferred from the kettle.

Scott also gave us the opportunity to experience other tasks in the brewery: filtering and kegging. I was assigned to keg a barrel and a half of the Cherry Porter that remained in a serving tank to make room for the filtered beer.



Meanwhile, Stacy helped Scott assemble the plate filter. We cleaned the now empty serving tank, which involved rinsing any residue of the Cherry Porter out of the tank and then climbing inside with a scrungie pad to wipe down the walls. After another rinse the tank was sanitized in the same manner as the fermenter.

At this point it was time to start the sparge. Scott started the run-off very slowly to ensure a good filter bed. He did a little recirculation before redirecting the run-off to the kettle. I was worried about the sparge because I have had trouble when using a high percentage of Munich at home. I had a large bag of rice hulls in the back of my truck just in case but, there was no need for the rice hulls as the sparge went very well.

During the runoff we learned of a brewers tradition of sampling some of the hot wort as a toast to the new brew. The wort is said to also provide the benefit of what can be described as 'marital invigoration' for the brewer. The wort was incredible sweet and had a nice maltiness from the Munich malt.

Once we had a couple of barrels of wort collected in the kettle, the burner was turned on while we collected the remaining wort for a total of 12 ¼ barrels in just over an hour.

As the wort came up to a boil we started to clean out the mash tun. This is another labor intensive part of the process. The mash is racked out of the tun into garbage cans to be carried out to the waiting pickup truck of a local farmer. The farmer feeds the grain to his herd of Black Angus cattle. He indicated that the cattle would go through the grain in about 10 minutes.

After we cleaned the grain out of the mash tun, Stacy and Scott went on to filter the Russian Imperial

Stout into the waiting serving tank while I finished cleaning out the mash tun and prepared the hops. We made sure to sample the Russian both prior to filtration and at the exit of the filter to compare the subtle difference caused by the filtering process. AJ was kind enough to be on hand to sample some of the unfiltered Stout and offer an insight (or two or three) on its complex flavor profile.

We saluted the transferred Stout by lowering the Russian flag from the fermenter and toasting with Russian vodka.

The boil was rather uneventful. Scott boils for 15 minutes before the first hop addition. We did two hop additions, one 60 minutes before the end of the boil and one 20 minutes before the end of the boil. Scott also adds Irish moss 10 minutes before the end of the boil.

When the boil was complete, Scott shut off the burner and allowed the wort to rest for 10 minutes. Next he whirlpooled the wort by pumping from the bottom of the kettle to an inlet on the side of the kettle. The whirlpool was done for about 20 minutes and then the wort was allowed to rest for another 10 minutes before being transferred to the fermenter.

The transfer to the fermenter is done through a heat exchanger that dropped the temperature of the wort to about 80F. The wort is also oxygenated during this process.



The yeast is pitched at the beginning of the transfer process (before the level of the wort in the fermenter reaches the hatch). There is a bit of ceremony around this as each person pours in a portion of the yeast while making a wish.

After the transfer was complete, there was a little more cleanup (including the kettle) and then it was over.

The end of the brew day was the start of the hardest part for me, waiting to see how things turn out. I am very anxious about the results of the brew. My biggest concern is the bitterness. I am worried that I did not properly account for the effects of the whirlpool and rest after the boil. Even though the beer will be within style according to my calculations of the worst-case scenario, I'm afraid the bitterness may be too assertive for the general public. Hopefully the additional bitterness will be complemented by the fact that the mash efficiency was even higher than expected with the O.G. being about 9 points higher than my typical batch at home.



Another concern is the yeast. Unfortunately the European Ale yeast we pitched did not take off. There was no apparent activity 24 hours after we pitched so Scott had to pitch some of his house yeast. Therefore, we are going to wind up with a hybrid of Scott's yeast and the European Ale. Any additional residual sweetness that remains based on the attenuation characteristics of the Smokehouse yeast should also help balance the hop bitterness.

I'd like to wrap up by asking for help with the name of the beer. I'm an engineer and have zero creativity when it comes to things like this. For now the beer is named PAW's Alt (PAW are my son's initials). But, I'm very open to suggestions.

Thanks again to everybody for giving me this opportunity. It really is a homebrewer's dream come true.



## April Meeting Dinner Buffet

As we have talked about for a little while, I have arranged with Brad for a buffet dinner to be served at Smokehouse. It took awhile, but things have finally come together. I look at this as an experiment and depending on how well things go this month, we can modify things in the future. Please give some feedback, good and bad, so we can come up with something better in the future. The menu this month will be:

Your choice of a pulled pork or a pulled chicken sandwich

Smashed spuds

A vegetable (probably green beans with red and green peppers)

A non alcoholic beverage (Soda, Iced Tea, Lemonade)

The cost is \$13 including tax and gratuity. Of course if you wish to sample the Smokehouses fine ales as well, they will happy to add that to your bill.

If you wish to get in on this, please respond by 6pm on Tuesday preferably by e-mail at [irwin.49@osu.edu](mailto:irwin.49@osu.edu) or by phone at 457-2487. I need to give Brad a count by closing time on Tuesday. Also this is a hard count. Whatever number I give Brad will have to be paid for. So if you are not sure whether you wish, or will be able to participate, please don't sign up. If you change you mind at the last minute, contact me and we might be able to arrange something (no guarantees however).

### AHA Club-Only Competitions:

#### Late May 2001

Category 14. Bock

#### August 2001

Category 19B. Witbier

#### Early October 2001

Category 6C.

California Common

#### Early December 2001

Category 10A. Mild



If you wish to send any entries to this year's AHA Nationals competition you still have some time. First round entries need to arrive in Honeoye Falls, NY by Friday the 13<sup>th</sup>.

Check <<http://beertown.org/AHA/NHC/2001/>> or the January/February and the March/April issues of Zymurgy for further information and entries forms. From the looks of things we are still tied for first place in the Homebrew Club of the Year competition.

# Basic Water Primer: A Technical Report by A. J. Zanyk

This is an attempt by me to understand what the various components of water do for a brew. I take no real credit for the following text as it is all a composite of many sources. I put this together from several popular brewing books, the internet, and some input from Herb Bresler.

\* Ca: Calcium.

In the form of:

(Calcium Carbonate,  $\text{CaCO}_3$ , Chalk. Strong Alkaline/Base buffer.

(Calcium Sulfate,  $\text{CaSO}_4$ , Gypsum. Medium Acidity.

(Calcium Chloride,  $\text{CaCl}_2$ , Mild Alkaline/Base buffer.

60% of "Total Alkalinity". Primary contributor to hardness of water. Also plays critical role in mashing and brewing chemistry and therefore is required for successful brewing. For flavor purposes, acceptable levels 5 to 200 ppm. The usual goal is 80 to 100 ppm for mash and sparge water. Calcium is the principal mineral of hardness, having come from the water's passage over limestone, dolomite, gypsum or calcified gypsiferous shale. Calcium increases mash acidity and inverts malt phosphate. In appropriate amounts, calcium is advantageous to the brew. It stimulates enzyme activity and improves protein digestion, stabilizes the alpha amylase, helps gelatinize starch and improves lauter runoff. Calcium also extracts fine bittering principles of the hop and reduces haze and wort color. A calcium precipitate formed with potassium phosphate improves hot-break flocculation. It is also an essential part of yeast-cell composition; small amounts of calcium neutralize substances toxic to yeast such as peptone and lecithin. During aging, it improves clarification, stability, and flavor of the finished beer. In excess, however, calcium precipitation with organic phosphates interferes with runoff filtering and robs the wort of phosphate, a necessary yeast nutrient. Its solubility is greatly affected by the anions in solution with it. For a typical recipe, a minimum calcium level of 30 - 40 ppm is desirable for proper mash and to stabilize alpha amylase. For this reason it is generally advantageous to add Calcium bearing salts to the mash and then using Lactic Acid, if needed, to adjust water pH.

\*  $\text{CO}_3$ : Bicarbonate or Carbonate.

In the form of:

(Calcium Carbonate,  $\text{CaCO}_3$ , Chalk. Strong Alkaline/Base buffer.

40% of "Total Alkalinity". May be expressed as "Alkalinity" or "Temporary hardness" in water reports. Also promotes the extraction of tannins from grains and hops and leads to darker colored beers. Carbonate is a strongly alkaline buffer (which raises P.H.) formed by the reaction of atmospheric carbon dioxide with hydroxides of alkaline-earth and alkali metals. Carbonates go into solution as hydrogen carbonates ( $\text{HCO}_3^-$ , "bicarbonates"). Bicarbonates form by the reaction of a carbonate ion with a molecule each of carbon dioxide and water. Carbonates resist increases in mash acidity by neutralizing acids as they are formed. It also hinders gelatinization of starch by alpha amylase, impedes trub flocculation during the cold break, and increases risk of contamination in the ferment. It contributes a harsh, bitter flavor overwhelming in delicate lagers, and carbonate in excess of 200 ppm is tolerable only when a dark-roasted malt is used to buffer its excessive acidity. Preferably, carbonate should be less than 50 ppm when pale malt or infusion mashing is used. Above 100 ppm the water is considered to have temporary hardness. (Temporary since some can be boiled out of suspension.) Above 100 ppm bicarbonates will neutralize acid. Carbonate / Sulfate ratio influences hop flavor. Chalk is best added directly to the mash to adjust pH, since the mash acidity will dissolve it readily. Chalk (which adds calcium and Alkalinity) is barely soluble in water. Bicarbonate is temporary hardness (can be boiled out). Carbonate is permanent (can't be boiled out). The alkaline effects of Carbonates can be neutralized using Lactic Acid.

\* Cl: Chloride.

In the form of:

(Calcium Chloride,  $\text{CaCl}_2$ , Mild Alkaline/Base buffer.

(Sodium Chloride,  $\text{NaCl}$ , Salt. No effect on pH.

Chloride enhances beer flavor and palate fullness. The "salt" taste of chloride generally increases perception of sweetness or mellowness accentuates and smooths bitterness, increases stability of any solution, and improves clarity, but the salt flavor can be reduced with calcium and magnesium. Usually found at levels of 1 to 100 ppm, (usually under 50), especially in the presence of sulfate, and can go up to 350 ppm in beers greater than 1.050 in gravity.

\* Mg: Magnesium.

In the form of:

(Magnesium Sulfate,  $\text{MgSO}_4$ , Epsom Salt.

Magnesium is the secondary mineral of hardness. It is an enzyme cofactor and yeast nutrient that is necessary in small amounts in all brewing water. Magnesium accentuates beer flavor at 10 to 30 ppm and contributes astringent bitterness when present in excess. Usually found at levels of 2 to 50 ppm, its solubility is less affected by carbonate anions in solution than is calcium. Over 125 ppm, it is a diuretic and cathartic. In other words, it is a prominent component of most laxatives. Between 10 and 15 ppm are recommended.

\* K: Potassium. No real benefits. Keep below 10 ppm. or lower.

\* Na: Sodium.

In the form of:

(Sodium Chloride, NaCl, Salt. No effect on pH.

Contributes sour, salty taste that can accentuate beer flavors at reasonable levels. Poisonous to yeast and harsh tasting when in excess. Sodium and chloride can enhance beer flavor at levels of 2 to 100 ppm, but keep an eye on these as too much (especially of both together) can lend a "salty" character. Sodium is very soluble. Use only non-iodized salt (iodine can be toxic to yeast). While a non-iodized "Sea Salt", "Kosher Salt" or Pickling Salt" form is preferred, with the quantities you will be using any type will do. Be sure you get Sodium Chloride as some salt alternatives may be a blend of other chemicals. Keep under 100 ppm (usually under 50), especially in the presence of sulfate.

\* SO4: Sulfate.

In the form of:

(Calcium Sulfate, CaSO4, Gypsum. Medium Acidity.

(Magnesium Sulfate, MgSO4, Epsom Salt.

Sulfate is weakly basic, and its Alkalinity is overcome by most acids. It is fairly soluble. Carbonate / Sulfate ratio influences hop flavor. With Sodium and Magnesium it is cathartic. Sulfate gives beer a dryer, crisper, fuller flavor, enhances hop bitterness, although the taste is somewhat "sharp". Compliments high hopping levels and strongly bitter above 500 ppm, but can go as high as 700 ppm or more in Burton-style ales. Most pale ales can tolerate or even benefit from high levels of sulfate, but most other beers should have limited sulfate. Normally best below 50 - 60 ppm in general and as little as possible for light, delicate lagers.

\* pH & Lactic Acid: ( 5.1-5.3 is optimum mash and wort pH. )

Lactic Acid can be found in most Homebrew supply shops. It is usually sold in a 88% solution and very little is actually required. Depending on the base water used you should need only 25 to 50 drops over the course of an entire 5 gallon batch. It is safe for brewing as the yeast actually consume it during fermentation.

Mash-in water (Pre-grains) should be around pH 5.5-6. Once grains are added, the mash will then naturally set itself to pH 5.1-5.3. Most tap and bottled water will end up around pH 6-7.

Sparge water should be pH 5.0 - 5.5, or slightly lower to avoid leeching tannins from the grain husks.

When using Lactic Acid to balance pH in mash water, add only enough to undo the buffering ability of the carbonates. Example: Adding Lactic Acid after all the salts, and stirring frequently until the water clears is a good starting point.

\* 0 - 7 "Acidic", "low pH"  
\* 7 - 14 "Base/Alkaline" "High pH"

\* Columbus Water:

From the Dublin Rd or Hap Cremean water plants. Generally these are good base waters and can be used for most beer styles thanks to our friends at A.B. Water profiles from around the world can be duplicated through the addition of the salts listed above in various quantities, or by mixing with distilled water to reduce salt levels. A carbon filter is generally recommended to remove Sediment, Chlorine and Bacteria. Columbus water plants do not use Chloramines (a Chlorine and Ammonia sterilant). So a short boil or leaving water out for a day or two in an open container will generally remove Chlorine.

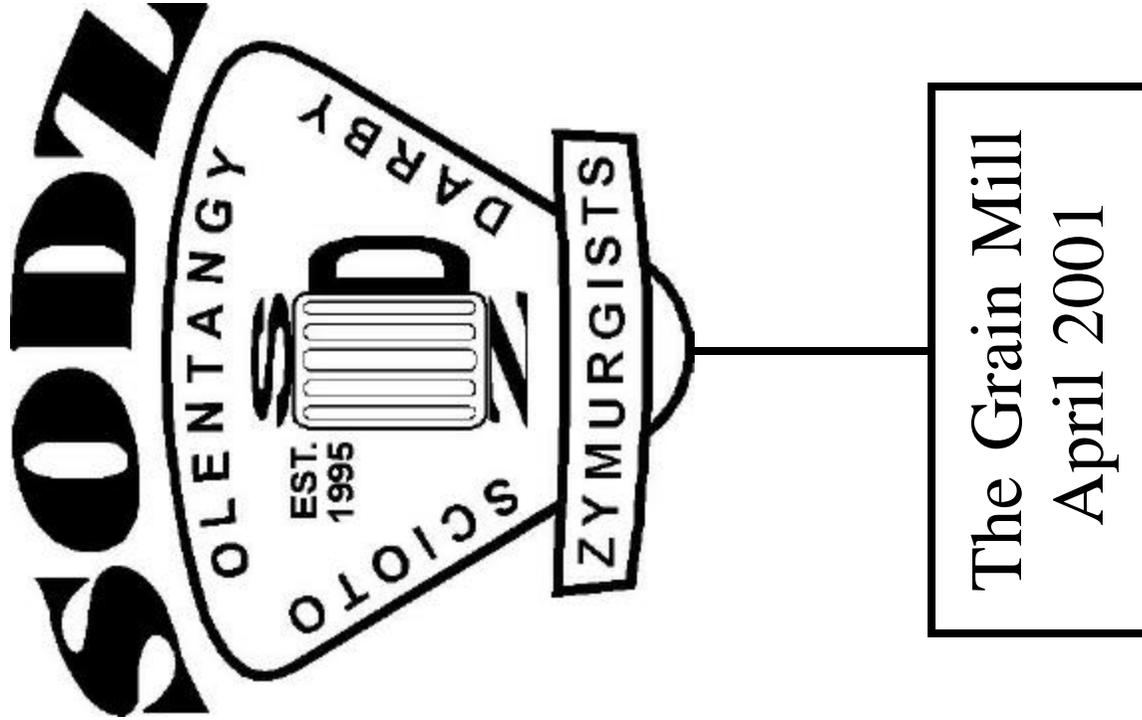
\* Dublin Rd Water Plant Specs.

I put together a simple FileMaker Pro database file and obtained 6 years of data sheets from the water plant. The chart represents the averages of each brew related salt for each month from 1996 thru 2000. The chart was derived from a more detailed monthly database that I can make available to club members using FileMaker.

Monthly Averages for Dublin Rd. Water Plant ( Composite of Six year period from 1995 - 2000 )							
Month	Calcium	Carbonate	Chloride	Magnesium	Potassium	Sodium	Sulfate
January	23.40	35.10	84.17	8.00	7.45	85.50	119.83
February	22.40	33.60	66.83	7.33	5.55	72.17	102.83
March	20.53	30.80	53.67	7.33	4.45	54.33	93.00
April	19.80	29.70	49.00	7.67	4.47	49.50	96.17
May	19.33	29.00	46.33	7.33	4.27	44.83	90.67
June	18.20	27.30	51.33	6.50	4.62	43.83	88.83
July	16.67	25.00	45.33	6.50	5.23	49.17	97.33
August	17.47	26.20	53.00	6.83	4.78	45.83	97.50
September	17.87	26.80	55.00	6.67	5.33	54.50	115.00
October	20.47	30.70	54.33	7.83	6.33	67.67	130.83
November	21.73	32.60	59.50	8.00	6.70	74.33	140.17
December	23.87	35.80	63.00	8.83	6.40	73.83	128.83

\* Hap Cremean Water Plant Specs.

I also have 6 years of data sheets from the Morse Rd water plant from 1996 thru 2000, but have not done anything with them since I do not use that water. If anyone using FileMaker Pro wants to borrow the sheets and input the data, let me know and we can make arrangements to get you the database file.



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