BREWSHEET v3.4 (2014-12-14)

user input
calculated

Brew			
Name:	Vienna Lager		
Brew Date:	2015 March 10	Collected (gal):	11.20
Rack Date:		Racked (gal):	
Keg/Bottle Date:	2015 March 29	Kegged/Bottled (gal):	10.00
Estimated		**Actual**	
ABV (%):	5.0%	ABV (%):	5.1%
OG (SG):	1.050	OG (SG):	1.050
FG (SG):	1.011	FG (SG):	1.011
IBU:	20.9	IBU:	20.5
SRM:	5.7	SRM:	5.6
IBU/Gravity Ratio:	0.42	IBU/Gravity Ratio:	0.41

Grain	Pounds	Potential	SG Share	Color	% Bill
Vienna Malt	16.39	1.036	0.038	3.5	76.63%
Maris Otter Malt	5.00	1.038	0.012	4.0	23.37%

Hop	Type	Ounces	Boil Time	Alpha %	IBU	% Bill
Hallertauer (GR)	P	4.00	45	2.7%	15.6	61.54%
Hallertauer (GR)	P	2.50	15	2.7%	5.3	38.46%

Design Notes

Mash-in at 1.5qts/lb to a target temp of 127F; rest for 45 min.
5 min into the rest, decoct 2.5 gal (@0.65 qts/lb – thick), boil for 40 min, return to raise mash temp to 150F; rest for 60 min.
With 25 min left in the rest, decoct 2.5 gal (@1.5 qts/lb – thin), boil for 20 min, return to raise mash temp to 168F; recirculate for 15 min and collect first runnings.
Sparge at 168F, recirculate, and collect second runnings.

Batch Variables and Calculations	
Batch Size (gal):	11.00
Grain Temperature (F):	63
Total Grain Weight (lbs):	21.39
Mash	
Mash Time (min):	45
Desired Mash Temperature (F):	127
Strike Water (gal):	7.83
Strike Temperature (F):	143
Mash Ratio (qts/lb):	1.46
Grain Absorption (gal):	2.67
Mash Volume (gal):	9.54
Mash-out Temperature (F):	168
Estimated First Runnings (gal):	5.02
First Runnings (gal):	5.00
First Runnings Gravity (Brix):	20.20
First Runnings Gravity (SG):	1.078
Sparge	
Desired Sparge Temperature (F):	170
Sparge Water (gal):	7.72
Sparge Water Temperature (F):	175
Estimated Second Runnings (gal):	8.19
Second Runnings (gal):	8.70
Second Runnings Gravity (Brix):	7.00
Second Runnings Gravity (SG):	1.027
Estimated Preboil Volume (gal):	13.21
Estimated Preboil Gravity (Brix):	11.82
Preboil Volume (gal):	13.70
Preboil Gravity (Brix):	11.90
Preboil Gravity (SG):	1.046
Extraction Efficiency (%):	81%
Boil	
Boil Time (min):	60
Estimated Evaporation Loss (gal):	0.81
Hop Absorption (gal):	0.16
Volume Left in Kettle (gal):	0.00
Actual Evaporation Rate (gal/hr):	1.09
Actual Evaporation Loss (gal):	1.09
Original Gravity (Brix):	12.81
Batch Size Efficiency (%):	70%
Actual Efficiency (%):	71%
Fermentation	
Primary Fermentation (days):	14
Primary Fermentation Temperature (F):	52
Gravity After Primary Fermentation (SG):	
Temperature of Reading (F):	
Corrected SG:	
Secondary Fermentation (days):	3
Secondary Fermentation Temperature (F):	62
Gravity After Secondary Fermentation (SG):	
Temperature of Reading (F):	
Corrected SG:	
Tertiary Fermentation (days):	28
Tertiary Fermentation Temperature (F):	32
Final Gravity (SG):	1.011
Temperature of Reading (F):	39
Corrected SG:	1.011
Target Fermentation for Diacetyl Rest (%):	70%
Target Gravity for Diacetyl Rest (SG):	1.023
Calories per Pint:	164
12 oz. Bottles Required:	102
Carbonation	
Bottling Temperature (F):	
Volumes of CO2:	2.50
Priming Sugar (oz):	
DME (oz):	
Forced Carbonation (lbs):	

System Variables	
Brewhouse Efficiency (%):	70%
Volume in Hoses (gal):	0.22
Volume in Wort Chiller (gal):	0.19
Volume in HERMS Coil (gal):	0.25
Mash/Lauter Tun Deadspace (gal):	0.14
Strike to Sparge Volume Ratio (%):	38%
Trub Loss (gal):	0.35
FWH IBU Factor (%):	10%
Strike Temperature Factor (F):	7
Sparge Temperature Factor (F):	4
Estimated Evaporation Rate (gal/hr):	0.81
Leaf Hop Absorption Ratio (qts/oz):	0.40
Pellet Hop Absorption Ratio (qts/ oz):	0.10
Cooling Losses (%):	4%
Hydrometer Correction (SG):	0.001

BJCP Style Guidelines	
Style:	Vienna Lager
Code:	3A
OG:	1.046-1.052
FG:	1.010-1.014
IBU:	18.0-30.0
SRM:	10.0-16.0
ABV:	4.5-5.7%
CO2:	2.4-2.6

Yeast Strain	
Yeast Strain:	White Labs WLP840 (American Lager)
Type:	American Lager
Attenuation (%):	75-80%
Actual Attenuation (%):	79%
Fermentation Temp (F):	50-55F
Flocculation:	medium

Required Amounts	
Cell Count (billions):	765
Vials (White Labs/Wyeast):	12.6
Dry Yeast (g):	38.3
Yeast Starter/Slurry	
Vials (White Labs/Wyeast):	4
Date Yeast Produced:	2015 January 9
Yeast Viability (%):	61%
Yeast Growth Rate:	3.15
Yeast Innoculation Rate (million/ml):	45.65
Starter Volume Required (ml);	5315
DME Required (oz):	17.27
Yeast slurry concentration (billion/ml):	2.5
Non-yeast Percentage (%):	20%
Yeast Slurry Required (ml):	581

User Variables	

Batch Scaling				
Desired OG:	1.049	Total Weight (lbs):		21.39
Batch Size (gal):	11.00	Total Bill:		100.00%
Brewhouse Efficiency (%):	70%			
Grain	**Pounds**	**Potential**	**Color**	**% Bill**
Vienna Malt	21.39	1.036	3.5	100.00%

Poundage		
Goal (lbs):		
Amount (lbs | oz.f_oz):		
Amount (lbs | oz.f_oz):		
Amount (lbs | oz.f_oz):		
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Amount (lbs | oz.f_oz):		
Amount (lbs | oz.f_oz):		
Amount (lbs | oz.f_oz):		
Needed (lbs | oz.f_oz):		

Hydrometer Correction		
SG:	1.009	
Temperature (F):	63	
Corrected SG:	1.010	

Gravity Calculator			
Brix:	12.70	12.81	
Specific Gravity:	1.049	1.050	
Degrees Plato:	12.16	12.26	

Brix Ethanol Correction	
Original Brix:	
Current Brix:	
SG:	

Brewing Notes

3/1: made a 4L starter
3/10: ran out of Vienna; subbed Maris Otter.
Mash-in temp was 135F; pulled 2.5 gal decoction after 5min and boiled.
After adding decoction back, temp was 149.5F.
Pulled another 2.5gal thinner decoction with 30min left in the 60min rest and boiled.
After adding decoction back, temp was 157F; recirculated for 15 min to 168F.
12.4 brix 15min into the boil; reduced boil time to 60min; 45min hops added at 35min (to account for whirlpool); 15min at 5min.
The starter had a huge diacetyl aroma when pitched.
3/13: First batch is 1.030 SG with slight diacetyl aroma (much less than the starter). Second batch is 1.026 SG and is very similar to the first batch.
3/14: increased temp to 57F. 12 hrs later, increased to 62F; 12 hours later to 64F.
3/20: 1.011 SG with no noticeable diacetyl in both aroma or flavor; aroma is quite different though; perhaps it's the hops? flavor is perfectly fine!
Second batch is exactly the same as the first, although maybe a tad bit clearer.
After waiting a bit and resampling, the aroma is fine (maybe a tad yeasty).
3/23: 1.010 SG; no diacetyl; wonderful aroma and flavor; crisp, clean. Second batch is the same; reducing temp to 59F.
3/24: reduced temp to 54F; 12 hours later to 49F.
3/25: reduced temp to 44F; 12 hours later to 39F.
3/26: reduced temp to 34F; 12 hours later to 32F.
3/29: kegged; first batch is 1.011 FG (5.1% ABV); aroma is malty with no hint of diacetyl; flavor is malt with a hint of pepper and very slight bitterness; finish is maltiness and graininess. Second batch is exactly the same in all aspects! Clarity of both is also the same. Seems delicious now; we'll wait and see until it is lagered and carbonated. Going back to 32F for 1 month.
4/27: Carbonated first batch.
5/1: Delicious brew! Malty, crisp, dry.