

# COPPER RANGE COMPANY

Adams Township, MI

## LOG OF BOILER TRIAL AT CHAMPION MILL

HEAD  
BOILER No 1

DATE \_\_\_\_\_

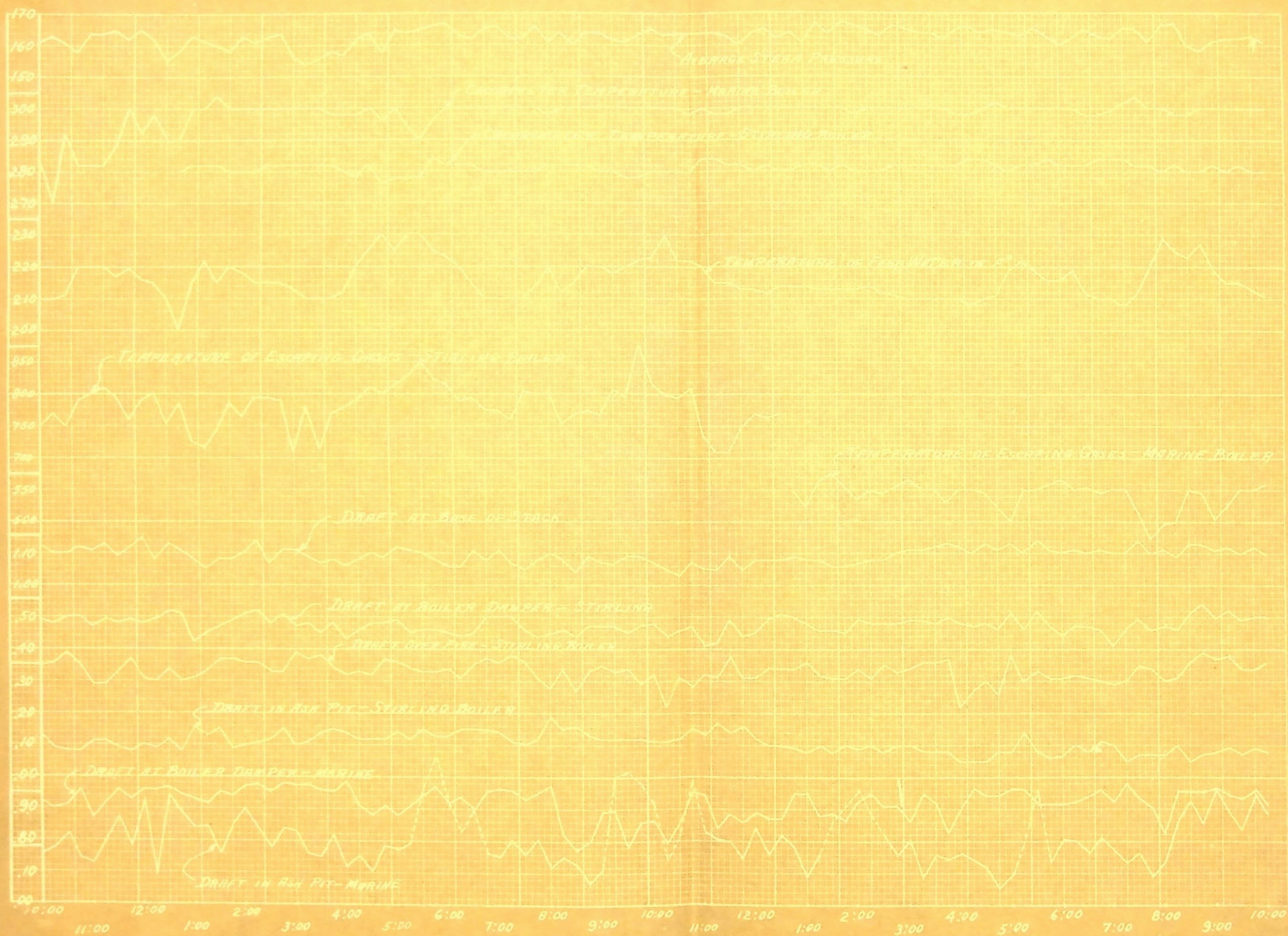
SHEET No \_\_\_\_\_ READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME STARTED	TIME STOPPED	LENGTH OF TIME STOPPED	CAUSE OF STOP		
1	10:00	12:33	1 hour	Feed Stop	Hours in test - 23-60 Time Idle - 1-16	
2	5:54	5:40	14 min	Stop feed		
3		9:20	2 1/2 minutes	Water leaked		
4					Time Operated - 22-44'	
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
TOTAL						
AVERAGE						

REMARKS: \_\_\_\_\_



# CHAMPION MILL BOILER HOUSE - PLANT TEST - MARCH 23, 24, 1916



CHICAGO NEW YORK

NO 285

THE F. C. BRONKHORST CO.



# COPPER RANGE COMPANY

Adams Township, MI

## LOG OF BOILER TRIAL AT CHAMPION MILL

HEAD \_\_\_\_\_  
~~BOILER~~ No 7 \_\_\_\_\_ DATE \_\_\_\_\_

SHEET No \_\_\_\_\_ READINGS TAKEN BY \_\_\_\_\_

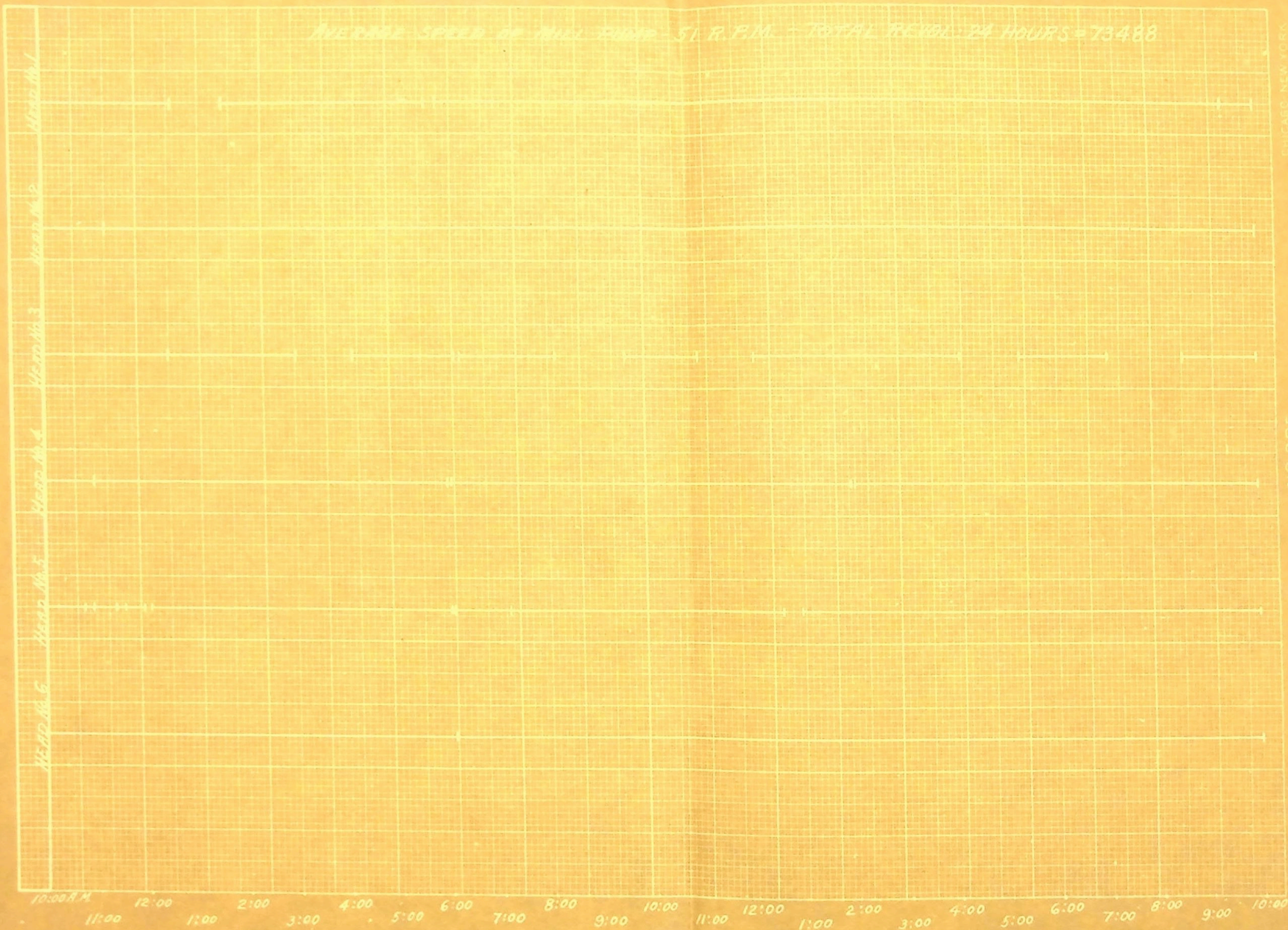
NUMBER	TIME		LENGTH OF TIME STOPPED	CAUSE OF STOP		
	STARTED	STOPPED				
1	10:00	11:15	17 minutes	Hopper Choked.		
2						73 Hr. - 59'
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
TOTAL						
AVERAGE						

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



CHAMPION MILL - LOG OF OPERATION OF STAMPS AND MILL PUMP

AVERAGE SPEED OF MILL PUMP 51 R.P.M. - TOTAL REVEL 24 HOURS = 73488



CHICAGO NEW YORK

No 285

PAUL FREUDENBERG BOSTON



# CHAMPION MILL BOILER HOUSE - PLANT TEST - MARCH 23, 24, 1916



CHICAGO - NEW YORK

No 285

THE FREDERICK POST CO



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT CHAMPION MILL

HEAD  
BOILER No 3

DATE

SHEET No READINGS TAKEN BY

NUMBER	TIME STARTED	TIME STOPPED	LENGTH OF TIME STOPPED	CAUSE OF STOP	Time Idle	
					Hr.	Min
1	10.00	12.36	1	Idle blocked		11
2	4.10	3		for steam	1	10
3	6.15	6.10		to loop at shoe		5
4	9.30	8.10		put on shoe	1	20
5						
6	12.3	10.56	1 hr. 7 mins	Low Steam.	1	7
7	5.17	4.5	1 hr. 12 mins	Low Steam	1	12
8	8.30	7	1 hr. 30	clean fires	1	30
9	5				5	85
10						
11					6	15
12						
13						
14					23	60
15					6	15
16						
17					17	45'
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
TOTAL						
AVERAGE						

REMARKS:-



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT CHAMPION MILL

HEAD  
BOILER No 4

DATE

SHEET No

READINGS TAKEN BY

NUMBER	TIME STARTED	TIME STOPPED	LENGTH OF TIME STOPPED	CAUSE OF STOP		
1	10.00	11.00	1.2	Hole blocked		
2	6 5	6		To look at shoe		
3						
4	1.58	1.55	3 Min	Hole blocked		
5						23 Hr. - 50 min.
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
TOTAL						
AVERAGE						

REMARKS:-



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT CHAMPION MILL

HEAD

BOILER No

5

DATE

SHEET No

READINGS TAKEN BY

NUMBER	TIME STARTED	TIME STOPPED	LENGTH OF TIME STOPPED	CAUSE OF STOP	Time	
					hr.	Min.
1	10:46		10-48			7
2	10:58		10-57 1/2			1 1/2
3	11:25		11-25 1/2			1/2
4	11:36		11-36 1/2			1/2
5	11:58		12:5	Wash		9
6	6:6	6:33	3, 7 min	boiler stopped		3
7						
8	R. Longbrash.					
9	3:12:8	3:12	5 min.	Hole choked		
10	3:37:4	3:37	4 "	"		2
11	7:10	7:12	2 "	not choked		15
12	12:25	12:50	15 "			
13						33
14						
15						1 hr 15'
16						
17						
18						
19						
20						23 60
21						0 33
22						<u>23 27</u>
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
TOTAL						
AVERAGE						

CS-



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT CHAMPION MILL

HEAD

BOILER No 6

DATE

SHEET No

READINGS TAKEN BY

NUMBER	TIME STARTED	TIME STOPPED	LENGTH OF TIME STOPPED	CAUSE OF STOP		
1	10:00					
2	6:9	6:7	2 min.	looked at shoe		
3						23-58'
4	R. Longhurst.					
5	000	000	000			
6	<del>000 000 000</del>					
7	<del>000 000 000</del>					
8						
9						
10						
11						
12						
13						
14						
15						
16					7-3	
17					3-11 ✓	
18					11-7	
19					7-10	
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
TOTAL						
AVERAGE						

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER No \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET No 60A READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	STIRLINGS				COAL FOR MARINES		
		COAL #1	FOR #2	#3	#4	COAL #1	#2	#3
1	10:00	0	0	0	0	0	0	0
2	11:00	2000	2200	1600	2000	1800	1800	1600
3	12:00	1400	1000	1200	1000	1000	800	1000
4	1:00	1400	1200	0	0	800	1000	1200
5	2:00	1400	1400	1800	1600	1800	1000	1000
6	3:00	600	200	1600	1000	1000	1600	1000
7	4:00	1200	1600	800	1400	1600	600	800
8	5:00	1800	1800	600	800	1000	1000	1000
9	6:00	800	1000	1000	1200	1000	1400	1000
10	7:00	1200	1200	1200	1200	1400	1200	1000
11	8:00	1400	1400	600	1000	1400	1400	1000
12	9:00	1200	1400	1600	1000	1400	800	1000
13	10:00	800	800	1400	1600	1000	800	1000
14	11:00	800	400	1200	1400	1000	1400	1000
15	12:00	1400	1600	1000	1000	1400	1200	600
16	1:00	2000	1600	1200	1200	1200	800	1400
17	2:00	1000	1000	800	1600	1800	1200	800
18	3:00	1200	1400	1200	800	1400	1200	1000
19	4:00	1400	1000	200	1000	1400	1200	1200
20	5:00	1400	1400	1400	1000	1000	600	1000
21	6:00	1000	600	1400	1000	1400	1000	800
22	7:00	600	1000	1000	1200	1800	1800	800
23	8:00	1400	600	800	1400	1000	600	400
24	9:00	1400	1600	600	600	400	800	1800
25	10:00	400	1000	800	1000	1200	600	200
26		29200	28400	25000	27000	30200	25800	23600
27								
28								
29								
30								
31	DEDUCT	168	189	42	—	—	—	287
32								
33								
TOTAL		29032	28211	24958	27000	30200	25800	23313
AVERAGE								

REMARKS:- \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE MARCH-23-24-1916.

SHEET NO. ASH READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	N°1 STIRLING		N°2 STIRLING		ASHES ABOVE GRATE	ASHES BELOW GRATE
		ASHES ABOVE GRATE	ASHES BELOW GRATE	ASHES ABOVE GRATE	ASHES BELOW GRATE		
1		340.0	385.5	519.5	396.5		
2		396.0		373.0		1044.5	1015.0
3		308.5	629.5	395.0	711.0	1287.5	1107.5
4		1044.5	1015.0	1287.5	1107.5	1301.0	1072.5
5						1328.5	789.0
6						1539.5	590.0
7						1341.0	567.5
8						1017.5	475.5
9						8859.5	5617.0
10		N°3 STIRLING		N°4 STIRLING			
11		455.0		472.0			
12		391.5		426.0		Less Moisture	
13		454.5	1072.5	425.5	789.0		
14		1301.0	1072.5	1328.5	789.0	7725	
15						5617	
16						13347	
17							
18		N°1 MARINE		N°2 MARINE			
19		209.5		211.0			
20		305.0		180.5			
21		241.0		297.0			
22		290.5	385.0	218.0	385.5		
23		260.5		212.0			
24		233.0	205.0	222.5	182.0		
25		1539.5	590.0	1341.0	567.5		
26		N°5 MARINE					
27		401.0	151.5				
28		359.0					
29		257.5	324.0				
30		1017.5	475.5				
31							
32							
33							
TOTAL							
AVERAGE							

REMARKS:- \_\_\_\_\_



# Copper Range Consolidated Co.

## LABORATORY

*Boiler Test March 23-24-1916*

Report on Samples from *Champion* Mill *March 29* 191*6*

Sample Number	Date Received in Laboratory	Material	Per Cent Cu. Dry Weight	Per Cent Cu. Wet Weight	Per Cent Moisture	REMARKS
<i>Carbon in ash</i>	<i>below</i>	<i>grates</i>		<i>30.00%</i>	<i>70</i>	
<i>"</i>	<i>"</i>	<i>above</i>		<i>24.65%</i>	<i>70</i>	
<i>Ash in level</i>	<i>sample</i>	<i>taken 9 1/2 hours</i>			<i>7.32%</i>	
<i>"</i>	<i>Regular</i>	<i>level sample</i>			<i>6.35%</i>	
<i>Average B.T.U. in level</i>	<i>sample</i>	<i>taken 9 1/2 hours</i>				<i>14045</i>
<i>"</i>	<i>"</i>	<i>Regular level sample</i>				<i>14182</i>



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO 1 MILL PUMP READINGS TAKEN BY \_\_\_\_\_

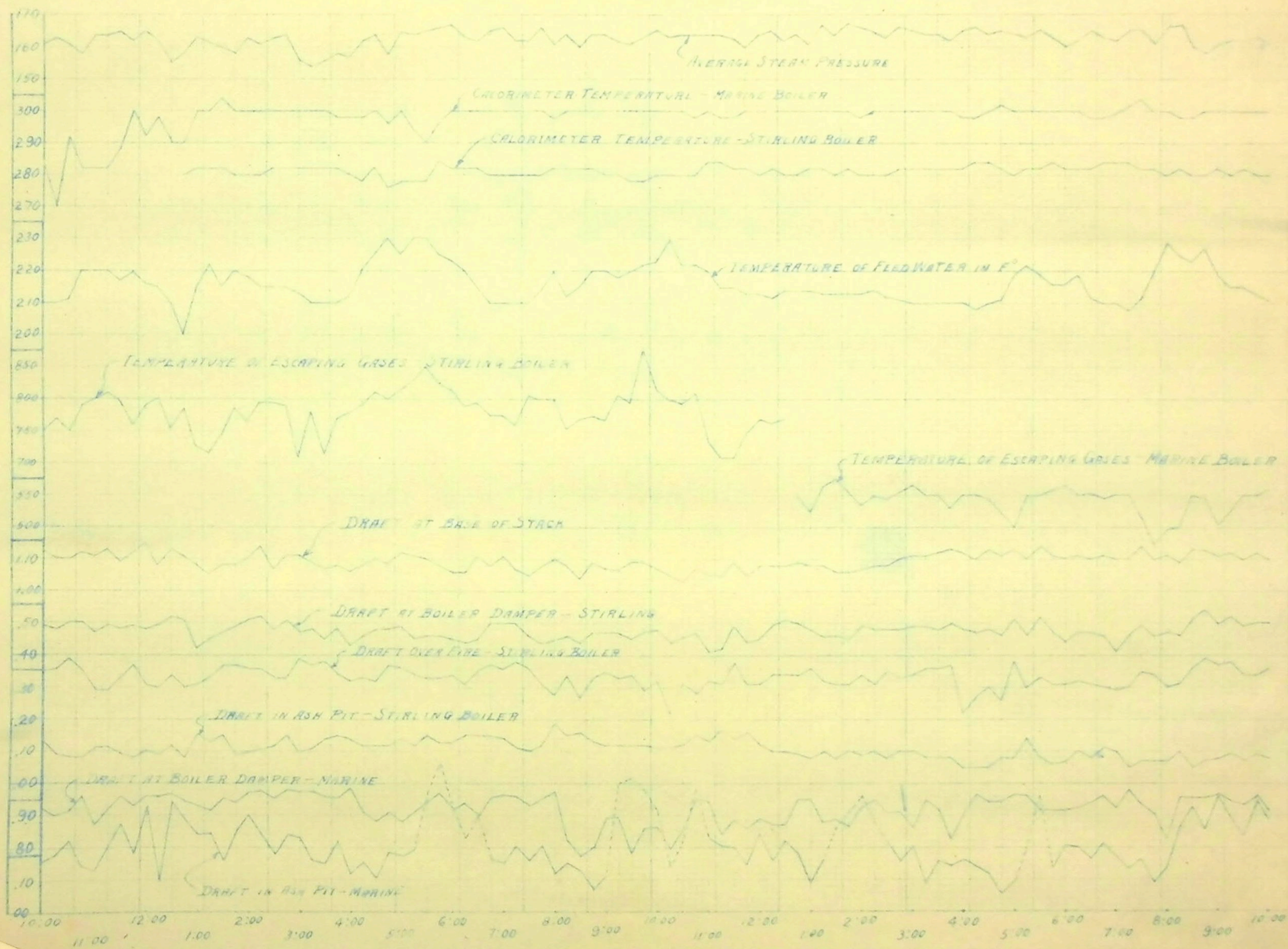
⊗

NUMBER	TIME	STEAM PRESSURE	REVOL. COUNTER	Number	Time	Steam Press.	Rev. Counter
1	10:00	155	299369	34	2-30	155	349808
2	10:30	157	300899	35	3-	160	351364
3	11:00	158	302427	36	3-30	158	352942
4	11:30	155	303974	37	4-	155	354499
5	12:00	159	305502	38	4-30	160	356081
6	12:30	160	307100	39	5-	155	357649
7	1:00	158	308574	40	5-30	158	359196
8	1:30	155	310112	41	6-	160	360741
9	2:00	158	311342	42	6-30	160	362303
10	2:30	158	313192	43	7	155	363975
11	3:00	153	314695	44	7-30	158	365502
12	3:30	150	316217	45	8-	158	366947
13	4:00	155	317648	46	8-30	153	368391
14	4:30	158	319212	47	9-	157	369879
15	5:00	157	320671	48	9-30	157	371358
16	5:30	158	322153	49	10-	153	372857
17	6:00	157	323720				299369
18	6:30	155	325261			7676	
19	7:00	155	326680				73488
20	7:30	159	328233				
21	8:00	157	329797				
22	8:30	155	331195				
23	9:00	155	332635				
24	9:30	160	334169				
25	10:00	155	335761				
26	10:30	158	337202				
27	11:00	155	338869				
28	11:30	155	340568				
29	12-	158	341989				
30	12-30	160	343539				
31	1-	160	345096				
32	1-30	155	346644				
33	2-	160	348246				
TOTAL							
AVERAGE							

REMARKS: \_\_\_\_\_



CHAMPION MILL BOILER HOUSE - PLANT TEST MARCH 23, 24, 1916





# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE \_\_\_\_\_

SHEET NO. ASH READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	ASHES FROM STIRLING'S				ASHES FROM MARINES.		
		#1	#2	#3	#4	#1	#2	#3
1		130	123.5	118.5	134	117	124	122.5
2		120.5	121.5	115.5	135.5	129.5	127	119.0
3		123.5	124.5	77.0	143	65	62	111.0
4		98	128.0	112	141	127.0	120.5	122.0
5		120.0	117.0	113	93.5	116.0	128.0	93.0
6		117.0	103.0	123	122.0	127.0		131.0
7		128.0	117.5	114.0	114.0	69.0	130.0	92.0
8		122.0	112.5	106.0	133.0	121.0	132.5	26.0
9		42.5	125.0	106.5	103.5	124.0	133.5	102.0
10		112.0	120.0	121.0	118.5	95.0	107.0	101.0
11		117.0	56.5	141.0	146.5	125.0	132.0	109.0
12		112.0	44.0	146.5	140.0	121.5	60.0	103.0
13		104.0	116.5	140.5	138.0	143.0	125.5	130.-
14		121	115.0	160.5	137.0	107.0	117.0	131.-
15		128	112.5	121.5	122.0	111.0	124.0	97.-
16		140	85.0	130.5	119.0	121.0	122.0	345.0 = 61 <sup>#</sup> Box
17		98	145.5	116.5	124.0	115.0	62.0	101.0 = " "
18		98	150.0	117.0	119.0	96.0	141.5	
19		105.5	139.0	122.0	127.0	135.0	137.5	X
20		131.0	96.5	128.0	128.5	120.0	133.0	X
21		109.0	295.0	131.0	128.0	106.0	135.0	
22		130.0	309.0	128.0	122.0	124.0	55.0	
23		95.0	308.0	141.5	101.0	125.0	244	62 <sup>#</sup> TARE
24				128.5		93.0		
25		X	X	125.5	X	265.0	X	
26		X	X	84.5			X	
27						60 <sup>#</sup>		
28				X				
29								
30								
31								
32								
33								
TOTAL								
AVERAGE								

REMARKS: - 14<sup>#</sup> CAN - 33<sup>1/2</sup> CAN. + 67<sup>#</sup> BOX.



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER No. PLANT DATE \_\_\_\_\_

SHEET No. GENERAL READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	NOTE: - CONDITION OF FIRES AT START AND AT END TIME OF CLEANING FIRES. TIME OF BLOWING SOOT FROM TUBES. GENERAL PLANT CONDITIONS.
1	5:30	No 3 - No 4 STIRLINGS CLEANED
2	7:00	No 1 - No 2 STIRLINGS "
3	7:30	No 3 MARINE.
4	7:45	No 1 "
5	8:00	No 2 "
6	10:00	TEST STARTED.
7		
8	12:30	FIRST ASHES No 1 MARINE - ABOVE GRATE
9	12:40	" " " No 2 " " "
10	1:00	No 3 STIRLING CLEANED. - ASHES ABOVE GRATE.
11	1:10	No 4 " " " " " "
12	3:20	No 1 " " " " " "
13	3:35	No 2 " " " " ABOVE " "
14	3:50	No 3 MARINE " " " " " "
15	4:50	No 2 " " " " " "
16	5:30	No 1 " " " " " "
17	8:25	No 3 STIRLING " " " " " "
18	8:35	No 4 " " " " " "
19	9:05	No 2 MARINE " " " " " "
20	9:20	No 1 " " " " " "
21	9:50	ASHES BELOW GRATES - No 1 - STIRLING
22	10:00	" " " " No 3 MARINE
23	10:10	" " " " No 2 STIRLING
24	11:15	No 2 STIRLING CLEANED - ASHES ABOVE GRATE.
25	11:25	No 1 " " " " " "
26	11:55	No 3 MARINE " " " " " "
27	1:10	No 2 " " " " " "
28	1:25	No 1 " " " " " "
29	2:35	ASHES BELOW GRATE - No 1 MARINE
30	2:45	" " " " No 2 " "
31	4:30	No 3 STIRLING CLEANED - ASHES ABOVE GRATE
32	4:40	No 4 " " " " " "
33	4:55	No 2 MARINE " " " " " "
TOTAL		
AVERAGE		

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT -----

BOILER No ----- DATE -----

SHEET No ----- READINGS TAKEN BY -----

NUMBER	TIME						
1	5:10	No 1 MARINE CLEANED - ASHES ABOVE GRATE					
2	5:25	ASHES BELOW GRATE - No 3 STIRLING.					
3	5:50	"	"	"	- No 4	"	"
4	7:20	No 1 STIRLING CLEANED - ASHES ABOVE GRATE					
5	7:25	ASHES BELOW GRATE - No 1 STIRLING.					
6	7:30	No 2 STIRLING CLEANED - ASHES ABOVE GRATE					
7	7:55	ASHES BELOW GRATE - No 2 STIRLING.					
8	7:55	No 3 MARINE CLEANED - ASHES ABOVE GRATE					
9	8:05	ASHES BELOW GRATE - No 3 MARINE					
10	8:10	No 2 MARINE CLEANED - ASHES ABOVE GRATE					
11	8:20	ASHES BELOW GRATE - No 2 MARINE					
12	8:25	No 1 MARINE CLEANED - ASHES ABOVE GRATE					
13	8:35	ASHES BELOW GRATE - No 1 MARINE					
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
TOTAL							
AVERAGE							

REMARKS:-----



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER No. PLANT DATE March 23 1912

SHEET No. 1A READINGS TAKEN BY Paul Lintke

NUMBER	TIME	STEAM PRESSURE - STIRLINGS				STEAM PRESS. - MARINES			CALORIMETER TEMP. FOR MARINES
		#1	#2	#3	#4	#1	#2	#3	
1	10 am	161	160	161	163	160	161	176	295
2	10.15	164	163	165	165	160	165	175	270
3	10.30	162	160	161	164	159	168	170	292
4	10.45	157	158	156	163	157	163	175	282
5	11.	163	167	160	162	162	168	177	282
6	11.15	165	165	165	163	163	176	186	282
7	11.30	160	157	156	165	170	162	170	288
8	11.45	162	161	162	167	160	165	170	300
9	12.00	165	165	166	168	160	176	176	292
10	12.15	160	160	160	163	155	160	170	298
11	12.30	155	155	156	153	158	157	167	290
12	12.45	157	157	160	160	155	160	175	290
13	1 P.M.	161	163	165	165	160	170	175	310
14	1.15	160	165	157	165	160	165	175	300
15	1.30	160	160	161	164	156	163	174	304
16	1.45	157	158	160	163	155	160	175	300
17	2.00	163	162	163	166	160	165	175	300
18	2.15	160	161	162	164	160	165	170	280
19	2.30	162	162	164	165	160	165	170	300
20	2.45	163	163	165	166	163	173	175	300
21	3.00	156	156	156	158	155	160	175	300
22	3.15	155	152	155	160	150	155	175	300
23	3.30	155	155	150	160	155	157	174	300
24	3.45	160	156	157	162	156	162	175	298
25	4.00	157	156	158	162	156	160	170	298
26	4.15	162	163	160	160	165	160	172	298
27	4.30	165	167	163	166	166	165	170	300
28	4.45	155	157	160	162	158	162	175	296
29	5.00	165	165	165	166	163	168	175	300
30	5.15	165	165	165	166	161	166	175	299
31	5.30	165	165	165	166	163	168	178	290
32	5.45	167	166	168	170	160	170	177	296
33	6.00	169	167	168	169	163	170	180	300
TOTAL AVERAGE							?	NOT TESTED	

REMARKS: No. 2 STIRLING 10" HIGH ALLOWING FOR 10' WATER LEAD  
STIRLING 12" HIGH.



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

10.AM

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE MARCH 23, 1916

SHEET NO 1 B READINGS TAKEN BY MATT KUNTZ

NUMBER	TIME	STEAM PRESSURE - STIRLINGS				STEAM PRESSURE - MARINES			CALORIMETER TEMP FOR MARINES
		#1	#2	#3	#4	#1	#2	#3	
1	6.15 <sup>AM</sup>	162	160	162	163	157	164	176	300
2	6.30	160	160	163	165	160	167	176	300
3	6.45	165	163	168	165	162	167	170	300
4	7.00	165	165	166	168	166	165	177	300
5	7.15	162	162	164	161	160	165	177	300
6	7.30	159	168	160	165	160	165	176	300
7	7.45	167	165	160	167	164	166	175	300
8	8.00	160	157	160	162	155	160	174	298
9	8.15	165	165	165	165	162	167	174	300
10	8.30	159	157	160	165	165	165	176	300
11	8.45	165	167	163	163	164	168	177	300
12	9.00	160	162	160	160	158	164	174	300
13	9.15	160	162	162	160	160	168	175	300
14	9.30	157	162	162	160	160	160	175	250
15	9.45	160	165	165	165	160	165	175	300
16	10.00	165	165	167	168	160	165	176	300
17	10.15	160	165	162	166	160	170	170	300
18	10.30	165	164	165	167	160	170	175	300
19	10.45	165	162	165	167	160	168	175	298
20	11.00	165	162	165	166	163	170	170	300
21	11.15	162	160	168	168	162	168	174	298
22	11.30	160	160	163	165	165	168	175	298
23	11.45	162	160	160	165	160	167	175	300
24	12.00	166	163	165	165	162	168	175	300
25	12.15	168	167	165	165	162	170	176	300
26	12.30	160	162	164	162	160	149	175	300
27	12.45	163	163	165	165	162	170	178	300
28	1.00 PM	162	160	162	162	158	160	176	300
29	1.15	166	166	168	170	164	175	177	300
30	1.30	163	163	165	167	162	168	174	300
31	1.45	166	166	168	170	165	168	175	300
32	2.00	168	165	165	170	162	170	176	298
33	2.15	163	165	165	170	160	165	175	300
TOTAL AVERAGE									

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE March 23, 1911

SHEET NO. 1C READINGS TAKEN BY Matt Kuntz

NUMBER	TIME	STEAM PRESSURE - STIRLINGS				STEAM PRESSURE - MARINES			CALORIMETER TEMPERATURE FOR MARINES
		#1	#2	#3	#4	#1	#2	#3	
1	2:30	160	163	165	166	163	168	174	300
2	2:40	163	168	165	170	162	165	170	300
3	2:50	162	166	165	168	163	168	170	300
4	2:10	160	165	165	166	160	163	170	300
5	3:30	160	165	165	170	162	164	170	300
6	3:45	161	161	162	165	160	165	170	300
7	4:00	160	164	165	166	163	168	170	298
8	4:15	160	165	167	170	160	170	174	298
9	4:30	165	160	165	165	161	166	177	300
10	4:45	165	160	165	167	163	167	170	300
11	5:00	160	161	160	167	164	168	170	300
12	5:15	160	160	162	167	158	165	175	300
13	5:30	162	160	167	168	162	168	170	300
14	5:45	164	162	165	165	160	166	177	300
15	6:00	160	163	160	161	158	162	175	300
16	6:15	163	162	163	164	158	164	176	300
17	6:30	161	165	167	168	164	170	179	298
18	6:45	164	165	162	165	160	170	174	298
19	7:00	162	162	163	164	161	163	177	299
20	7:15	165	163	165	164	164	163	176	300
21	7:30	163	163	165	170	163	171	175	304
22	7:45	161	160	160	165	158	160	170	300
23	7:50	167	165	165	170	164	170	174	300
24	8:10	154	155	157	160	158	160	175	298
25	8:30	160	157	160	160	156	158	170	298
26	8:45	160	158	160	157	158	160	175	300
27	9:00	162	160	161	162	160	165	175	300
28	9:15	160	162	163	162	160	165	175	300
29	9:30	162	168	165	165	160	165	175	300
30	9:45	163	163	165	165	160	160	175	300
31	10:00	165	160	160	162	160	165	175	300
32									
33									
<b>TOTAL</b>		15730	15722	15813	16000	15403			28910
<b>AVERAGE</b>									298

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT \_\_\_\_\_

BOILER No \_\_\_\_\_

DATE \_\_\_\_\_

SHEET No \_\_\_\_\_

READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	COAL FOR STIRLINGS		COAL FOR MARINES			
		#1	#2	#3	#4	#2	#3
1			200	200		200	
2			200	200		200	
3			200	200		200	
4			200	200		200	
5			200	200		211	
6			200	200		200	
7			200	200		200	
8			200	200	11:00 AM	200	
9			200	200		200	11:00 AM
10			200	200		200	
11	11:00 AM		200	200		200	
12			200	200		200	
13			200	200		200	12:00 AM
14			200	200	12:00 AM	200	
15			200	200	1:00 PM	200	
16	12:00 AM		200	200		200	
17			200	200		200	
18			200	200		200	1:00 PM
19			200	200		200	
20			200	200		210	
21			200	200		200	
22			200	200		200	
23	1:00 PM		200	200		200	2:00 PM
24			200	200	2:00 PM	200	
25			200	200		200	
26			200	200		200	
27			200	200		200	
28			200	200		200	
29	2:00 PM		200	200		200	
30	3:00 PM		200	200		200	
31				200		200	3:00 PM
32				200	3:00 PM		
33							
TOTAL							
AVERAGE							

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT \_\_\_\_\_

BOILER NO \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO \_\_\_\_\_ READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	COAL FOR		STIRLINGS		COAL FOR MARINES		
		#1	#2	#3	#4	1	2	3
1			200	200			200	
2			200	200			200	
3			200	200			200	4:00 PM
4			200	200	4:00 PM		200	
5			200	200			200	
6			200	200			200	
7			200	200	5:00 PM		200	
8	4:00 PM ✓		200	200			200	5:00 PM
9			200	200			200	
10			200	200			200	
11			200	200			200	
12			200	200	6:00 PM		200	
13			200	200			200	
14			200	200			200	
15			200	200			200	6:00 PM
16			200	200			200	
17	5:00 PM ✓		200	200			200	
18			200	200	7:00 PM		200	
19			200	200			200	
20			200	200			200	
21			200	200	8:00 PM		200	7:00 PM
22	6:00 PM ✓		200	200			200	
23			200	200			200	
24			200	200			200	
25			200	200			200	
26			200	200			200	
27			200	200			200	
28	7:00 PM ✓		200	200			200	8:00 PM
29			200	200			200	
30			200	200			200	
31			200	200			200	
32			200	200			200	
33			200	200			200	
TOTAL			200	200				
AVERAGE	8:00 PM		200	200				

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT \_\_\_\_\_

BOILER NO \_\_\_\_\_

DATE March 23 - 14

SHEET NO \_\_\_\_\_

READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	COAL FOR		#2 MARINE	COAL FOR		MARINE
		#2 STIRLING	#3		#2 STIRLING	#3	
1		200	200	200	200	200	200
2		200	200	200	200	200	200
3		200	200	200	200	200	200
4		200	200	200	200	200	200
5		200	200	200	200	200	200
6		200	200	200	200	200	2:00 AM
7		200	200	200	200	200	200
8		200	200	200	200	200	200
9		200	200	200	200	200	200
10		200	200	200	200	200	200
11		200	200	200	200	200	200
12		200	200	200	200	200	200
13		200	200	200	200	200	200
14		200	200	200	200	200	200
15		200	200	200	200	200	200
16		200	200	200	200	200	200
17		200	200	200	200	200	200
18		200	200	200	200	200	200
19		200	200	200	200	200	200
20		200	200	200	200	200	200
21		200	200	200	200	200	200
22		200	200	200	200	200	200
23		200	200	200	200	200	200
24		200	200	200	200	200	200
25		200	200	200	200	200	200
26		200	200	200	200	200	200
27		200	200	200	200	200	200
28		200	200	200	200	200	200
29		200	200	200	200	200	200
30			200		200	200	200
31			200		200		200
32			200		200		200
33							200
TOTAL							210
AVERAGE							200

REMARKS: \_\_\_\_\_

OVER



# COPPER RANGE CONSOLIDATED CO.

## ASSAY OFFICE.

CHAPION MILL.

MARCH, 2-3824 1916

Sample No.	Gross Wt.		Gross Wt.		Tare	Net Wt.		Net Wt.		Wt. Water	% Moist	% Solids
	Wet.	Wet.	Wt.	Dry		Wt.	Wet	Wt.	Dry			
<b>COAL SAMPLE</b>												
3-23-2	Pan W-off		30-13g		x	23-11	22-10			1-1		.045
3-23-6	"	"	"			32-8	30-2	2	6	2-6		.073
3-23-10	"	"	"		x	34-10	31-12			2-14		.083
3-24-2	"	"	"		x	26-10	25-10			0-16		.037
3-24-6	"	"	"			23-12	23-1			0-11		.029
3-24-10	"	"	"		x	19-4	18-6			0-14		.045
<b>ASH SAMPLE</b>												
3-23-6	Pan W-off					51-4	47-2			4-2		
3-23-9	"	"	"			28-15	24-15			4-0		



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE March 23-1916

SHEET NO. 5 A (#1) READINGS TAKEN BY Burt Suddern  
CO<sub>2</sub> - O - CO

NUMBER	TIME	CO <sub>2</sub>	O	CO	Duration	No of Boilers
1	10:48	9.2 ✓			57 Min	#1 Sterling
2	10:46	7.4 0			79 "	2 "
3	10:31	8.6 x	5.4	✓	58 "	3 "
4	10:30	8.2	6.0	✓	72 "	4 "
5	10:30	6.0	7.4	✓	80 "	#1 Marions
6	11:55	5.0	6.9	✓	78 "	2 "
7	11:04	13.8 ✓	1.8	✓	90 Min	#1 Sterling
8	11:25	8.2 0	3.8	0.4	83 "	2 "
9	11:40	8.4 x	7.8	0.2	70 "	3 "
10	11:53	9.6	5.4	✓	80 "	1 "
11	12:05	3.6			78 "	#1 Marions
12	12:28	5.0	11.8	✓	65 "	2 "
13	1:03	14.8 ✓	1.6	0.2	59 Min	#1 Sterling
14	1:05	8.6 0	1.4	1.0	69 "	2 "
15	1:00	9.6 x	7.4	0.4	85 "	3 "
16	1:38	6.4	9.0	0.4	67 "	4 "
17	2:09	13.6 ✓	3.0	✓	58 Min	#1 Sterling
18	2:24	10.6 0	5.6	✓	63 "	2 "
19	2:40	8.8 x	8.0	0.2	58 "	3 "
20	3:01	11.0	4.8	✓	59 "	4 "
21	3:57	7.0	9.8	0.2	135 "	#2 Marions
22	3:20	11.2 ✓	5.4	✓	55 Min	#1 Sterling
23	3:40	7.0 0	9.2	0.4	55 "	2 "
24	3:58	10. x	7.4	0.4	38 "	3 "
25	4:22	13.8	2.8	✓	39 "	4 "
26	4:28	15.2 ✓	1.2	0.2	56 Min	#1 Sterling
27	4:48	12.0 0	4.0	0.2	19 "	#2 "
28	5:06	11.0 x	6.2	0.4	54 "	#3 "
29	5:19	11.0	3.4	0.8	63 "	#4 "
30	6:22	5.0	8.6	✓	181 "	#2 Marions
31	5:37	12.4 ✓	5.2	0.2	65 Min	#1 Sterling
32	5:53	11.0 0	4.4	0.4	45 "	#2 "
33	6:40	8.0 x	5.0	0.2	29 "	#3 "
TOTAL						
AVERAGE						

REMARKS:-  
 \_\_\_\_\_  
 \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE March 23-1916

SHEET NO. 5 B (#2) READINGS TAKEN BY Burt Stoddard  
CO<sub>2</sub>-O-CO

NUMBER	TIME	CO <sub>2</sub>	O	CO	Duration	
1	6:50	11.2	4.2	0.4	55 Min	# 1 Sterling
2	6:59	12.2 ✓	6.2	0.2	68 Min	# 1 " f
3	7:18	12.0 0	4.8	0.2	76 "	# 2 "
4	7:40	11.0 x	6.4	0.2	75 "	# 3 "
5	8:00	5.4	8.2	0.6	69 "	# 4 "
6	10:35	5.6	8.2	0.8	120 "	# 2 Mariner
7	8:30	12.8 ✓	3.4	0.2	60 Min	# 1 Sterling
8	8:50	11.6 0	4.4	0.4	67 "	# 2 " p
9	9:07	12.8 x	3.8	0.2	53 "	# 3 "
10	9:25	11.2	3.4	0.6	66 "	# 4 "
11	9:51	12.4 ✓	4.8	0.2	64 Min	# 1 Sterling
12	10:13	10.2 0	6.6	0.2	67 "	# 2 " f
13	10:30	12.8 x	3.6	0.2	65 "	# 3 "
14	10:52	7.6	5.2	1.0	60 "	# 4 "
15	11:14	6.6 ✓	5.0	1.0	57 Min	# 1 Sterling
16	11:35	10.6 0	3.8	0.6	36 "	# 2 " f
17	11:54	9.0 x	5.6	1.2	55 "	# 3 "
18	12:07	5.6	4.6	0.8	83 "	# 4 "
19	11:45	7.0	6.6	0.8	139 "	# 2 Mariner
20	1:10	8.8	5.4	1.0	39 "	Sterling Plus
21	12:38	12.0 ✓	4.2	0.4	90 Min	# 1 Sterling
22	2:55	12.0 0	4.0	✓	47 "	# 2 " f
23	1:25	13.2 x	2.2	✓	95 "	# 3 "
24	1:48	11.0	3.6	✓		# 4 "
25	2:00	7.0	5.2	1.0	115 "	Sterling Plus
26	2:37	13.0 ✓	3.0	0.2	68 Min	# 1 Sterling
27	3:00	11.8 0	3.2	0.4	113 "	# 2 "
28	3:20	9.8 x	4.8	0.6	40 "	# 3 "
29	1:48	5.0	5.8	0.8	124 "	# 4 "
30	4:55	7.6	5.0	1.0	130 "	# 2 Mariner
31	4:40	11.0	5.2	1.2	80 "	Sterling Plus
32	1:00	13.0 ✓	2.4	0.6	50 "	# 1 Sterling
33	4:40	10.2 0	4.0	0.4	80 "	# 2 " f
TOTAL						
AVERAGE						

REMARKS: \_\_\_\_\_



Number

Time

Copper Range Company  
Log of Billy trail at Champion Mill  
Boiler No 1 Plant Gals Mar 23-1916

Sheet No 5 of 3

Reading taken by

Burt Stodden

CO<sub>2</sub>

O

CO

Duration

Time	CO <sub>2</sub>	O	CO	Duration	Notes
5:25	9.4 x	4.2	0.6	105 min	# 3 Stirling
6:22	10.2	3.2	0.6	63 "	# 4 " "
7:25	5.4	2.8	4.2	135 "	# 2 Mammie
6:30	7.8	2.2	0.8	126 "	Stirling & Fire
6:50	10.4 ✓	3.6	0.4	50 "	# 1 Stirling
7:09	5.0 0	4.6	0.8	102 "	# 2 Stirling
7:30	8.8 x	3.4	0.4	99 "	# 3 Stirling
7:55	11.8	2.2	0.4	85 "	# 4 Stirling
8:25	8.2	2.0	0.4	65 "	# Stirling & Fire
8:50	13.2 ✓	3.2	0.4	55 "	# 7 Stirling
9:08	11.2 0	2.6	0.2	42 "	# 2 "
					# 3 "
					# 4 "



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO MILL-1 READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	STEAM PRESSURE	VACUUM ON CONDENSER	R.P.M. OF MILL ENGINE			
1	10:00	158	18½	106			
2	10:30	155					
3	11	158					
4	11:30	154					
5	12	162					
6	12:30	152					
7	1	158					
8	1:30	159					
9	2	157					
10	2:30	157					
11	3	158					
12	3:30	157					
13	4	158					
14	4:30	159					
15	5	160					
16	5:30	160					
17	6	155					
18	6:30	158					
19	7	158					
20	7:30	157					
21	8	158					
22	8:30	159					
23	9	158					
24	9:30	157					
25	10	160					
26	10:30	159					
27	11	158					
28	11:30	159					
29	12	155					
30	12:30	157					
31	1	155					
32	1:30	157					
33	2	155					
TOTAL							
AVERAGE							

REMARKS:- \_\_\_\_\_



COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE \_\_\_\_\_

SHEET NO. MILL-V READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	STEAM PRESSURE	VACUUM ON CONDENSER	R.P.M. OF MILL ENGINE			
1	2 30	1 5 6					
2	3	1 5 7					
3	3 30	1 7 8					
4	4	1 5 7					
5	4 30	1 6 0					
6	5	1 5 5					
7	5 30	1 5 7					
8	6	1 5 4					
9	6 30	1 5 7					
10	7	1 5 8					
11	7 30	1 6 0					
12	8	1 6 2					
13	8 30	1 5 5					
14	9	1 5 7					
15	9 30	1 5 8					
16	10	1 5 6					
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
TOTAL AVERAGE							

REMARKS:- \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO PLANT DATE March 23-14

SHEET NO 2 A READINGS TAKEN BY R. H. Sealow

6 X 4

NUMBER	TIME	TEMP. OF OUTSIDE AIR	TEMP. AT BASE OF STACK	DRAFT AT BASE OF STACK	TEMP. OF BOILER ROOM	BAR. OMMETER	TEMP. OF FEED WATER	R.P.M. OF FAN	R.P.M. OF ENGINE
1	10:00	18°	370°	1.12	67°		210°		115.
2	10:15	19°	400°	1.10	47°	28.88	210°		
3	10:30	20°	420°	1.10	55°	28.88	211°		
4	10:45	20°	430°	1.12	53°		220°		
5	11:00	21°	410°	1.11	58°		220°		
6	11:15	21°	400°	1.13	65°	28.88	220°		
7	11:30	22°	400°	1.09	74°		217°		
8	11:45	23°	400°	1.12	69°		220°		
9	12:00	23°	422°	1.15	66°	29.00	216°		
10	12:15	24°	410°	1.08	65°		215°		
11	12:30	24°	400°	1.13	66°		210°		
12	12:45	24°	382°	1.11	56°		200°		
13	1:00	24°	400°	1.08	66°	28.94	215°		
14	1:15	25°	405°	1.05	56°		222°		
15	1:30	25°	419°	1.08	56°		215°		
16	1:45	26°	420°	1.08	56°		220°		
17	2:00	28°	422°	1.10	55°	28.94	218°		
18	2:15	27°	420°	1.14	55°		215°		
19	2:30	28°	420°	1.07	55°		215°		
20	2:45	28°	419°	1.11	50°		215°		
21	3:00	28°	430°	1.11	63°	28.94	213°		
22	3:15	30°	400°	1.09	66°		210°		
23	3:30	29°	420°	1.07	68°		210°		
24	3:45	29°	420°	1.08	68°		210°		
25	4:00	30°	420°	1.06	70°	28.87	212°		
26	4:15	30°	410°	1.08	67°		220°		
27	4:30	30°	410°	1.10	70°		225°		
28	4:45	30°	420°	1.09	63°		230°		
29	5:00	29°	419°	1.12	57°	28.83	225°		
30	5:15	28°	427°	1.11	58°		230°		
31	5:30	28°	420°	1.10	57°		230°		
32	5:45	28°	430°	1.08	57°		225°		
33	6:00	28°	450°	1.06	58°	28.90	223°		
TOTAL									
AVERAGE									

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE MARCH, 23-14

SHEET NO. 2 B READINGS TAKEN BY R. H. Sealow

NUMBER	TIME	TEMP. OF OUTSIDE AIR	TEMP. AT BASE OF STACK	DRAFT AT BASE OF STACK	TEMP. OF BOILER ROOM	BAR-OMETER	TEMP. OF FEED WATER
1	6.15 <sup>24</sup>	23°	430°	1.06	66°		220°
2	6.30	24°	440°	1.11	60°		215°
3	6.45	24°	432°	1.08	67°		210°
4	7.00	25°	430°	1.11	61°	28.80	210°
5	7.15	24°	440°	1.07	65°		210°
6	7.30	24°	432°	1.05	66°		210°
7	7.45	24°	438°	1.08	65°		214°
8	8.00	24°	430°	1.10	63°	28.80	220°
9	8.15	24°	440°	1.08	65°		212°
10	8.30	24°	438°	1.04	65°		225°
11	8.45	24°	425°	1.09	67°		220°
12	9.00	24°	440°	1.07	64°	28.90	220°
13	9.15	24°	410°	1.07	64°		218°
14	9.30	26°	400°	1.09	64°		220°
15	9.45	24°	418°	1.09	62°		222°
16	10.00	24°	420°	1.07	71°	28.90	223°
17	10.15	26°	430°	1.05	70°		230°
18	10.30	26°	410°	1.03	67°		222°
19	10.45	24°	440°	1.07	65°		222°
20	11.00	26°	419°	1.05	69°	28.80	220°
21	11.15	26°	412°	1.05	67°		215°
22	11.30	26°	422°	1.09	67°		215°
23	11.45	26°	400°	1.05	69°		213°
24	12.00	28°	400°	1.08	66°	28.79	213°
25	12.15	29°	410°	1.08	67°		212°
26	12.30	28°	419°	1.08	69°		214°
27	12.45	28°	421°	1.09	69°		214°
28	1.00	28°	443	1.08	70°	28.79	214°
29	1.15	28°	399	1.08	71°		213°
30	1.30	28°	399	1.06	73°		213°
31	1.45	28°	424	1.06	73°		213°
32	2.00	28°	430	1.07	72°	28.80	213°
33	2.15	26°	432	1.08	69°		214°
TOTAL AVERAGE							

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE MARCH, 23-14

SHEET NO. 2C READINGS TAKEN BY R. H. Sealow.

NUMBER	TIME	TEMP. OF OUTSIDE AIR	TEMP. AT BASE OF STACK	DRAFT AT BASE OF STACK	TEMP. OF BOILER ROOM	BAR - OMMETER	TEMP. OF FEED WATER
1	2.30	26.°	438.°	1.08	65.°		212.°
2	2.45	27.°	439.°	1.10	68.°		211.°
3	3.00	28.°	438.°	1.11	68.°	28.76	210.°
4	3.15	28.°	440.°	1.11	66.°		210.°
5	3.30	26.°	430.°	1.12	67.°		210.°
6	3.45	28.°	420.°	1.13	66.°		210.°
7	4.00	28.°	420.°	1.12	65.°	+ 28.76	210.°
8	4.15	28.°	420.°	1.10	67.°		208.°
9	4.30	28.°	439.°	1.13	63.°		210.°
10	4.45	28.°	429.°	1.11	65.°		211.°
11	5.00	28.°	418.°	1.13	66.°	28.82	219.°
12	5.15	28.°	389.°	1.10	67.°		222.°
13	5.30	28.°	400.°	1.14	65.°		219.°
14	5.45	29.°	439.°	1.11	63.°		216.°
15	6.00	29.°	430.°	1.10	73.°	28.83	216.°
16	6.15	30.°	440.°	1.11	75.°		219.°
17	6.30	30.°	418.°	1.10	72.°		212.°
18	6.45	30.°	420.°	1.11	73.°		210.°
19	7.00	31.°	430.°	1.10	74.°	28.83	210.°
20	7.15	31.°	440.°	1.10	70.°		208.°
21	7.30	31.°	424.°	1.14	64.°		212.°
22	7.45	31.°	422.°	1.10	61.°		220.°
23	8.00	32.°	400.°	1.11	62.°	28.70	229.°
24	8.15	31.°	390.°	1.09	63.°		225.°
25	8.30	31.°	380.°	1.13	63.°		223.°
26	8.45	31.°	410.°	1.13	62.°		227.°
27	9.00	31.°	418.°	1.11	60.°	28.69	219.°
28	9.15	32.°	405.°	1.12	61.°		215.°
29	9.30	31.°	388.°	1.10	60.°		215.°
30	9.45	31.°	420.°	1.12	61.°		213.°
31	10.00	30.°	418.°	1.10	60.°	28.68	211.°
32							
33							
TOTAL		2577	40630	106.09	6276	749.71	20968.°
AVERAGE		76.5	1419	1.09	64.7	28.83	216

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE March 23

SHEET NO. 4 A READINGS TAKEN BY Paul Ledthe  
11 MARINES

NUMBER	TIME	TEMP. OF FLUE GASES MARINES	DRAFT AT BOILER DAMPER			DRAFT UNDER FIRE MARINES			DRAFT OVER FIRE MARINES		
			*1	*2	*3	ASH PIT	*1	*2	*3	LOWER GRATE	
1	10.00	460	.91	.93		.12	.20	.05	.43	.37	.32
2	10.15	460	.95	.85		.19	.16	.06	.37	.43	.31
3	10.30	460	.96	.86		.16	.28	.05	.35	.32	.47
4	10.45	445	.94	.94		.17	.12	.04	.36	.36	.37
5	11.00	460	.85	.88		.20	.05	.04	.34	.34	.41
6	11.15	460	.96	.87		.22	.19	.05	.38	.32	.39
7	11.30	460	.95	.97		.36	.18	.09	.40	.40	.36
8	11.45	460	.92	.94		.14	.14	.04	.49	.45	.41
9	12.00	460	.98	.94		.47	.19	.03	.63	.41	.46
10	12.15	440	.99	.93		.06	.13	.03	.40	.37	.44
11	12.30	440	.96	.98		.66	.03	.03	.58	.35	.52
12	12.45	420	.94	.96		.29	.99	.02	.34	.37	.58
13	1.00	415	.94	.92		.30	.19	.01	.36	.33	.36
14	1.15	440	.96	.97		.24	.25	.02	.32	.36	.47
15	1.30	459	.97	.94		.16	.16	.01	.30	.32	.47
16	1.45	460	.96	.92		.22	.28	.0	.37	.39	.47
17	2.00	460	.96	.94		.32	.28	.01	.43	.37	.50
18	2.15	460	.96	.99		.22	.26	.01	.35	.39	.54
19	2.30	460	.99	.92		.21	.15	.02	.42	.31	.50
20	2.45	460	.99	.97		.21	.27	.02	.39	.39	.48
21	3.00	460	.94	.97		.29	.17	.01	.50	.37	.51
22	3.15	460	.99	.96		.19	.14	.02	.36	.28	.46
23	3.30	460	.98	.94		.15	.15	.02	.32	.37	.49
24	3.45	460	.99	.92		.18	.26	.02	.42	.30	.47
25	4.00	420	.100	.97		.12	.12	.02	.28	.31	.49
26	4.15	426	.92	.90		.14	.17	.05	.39	.36	.43
27	4.30	440	.85	.92		.17	.04	.05	.46	.37	.36
28	4.45	440	.94	.88		.19	.18	.03	.48	.38	.41
29	5.00	430	.92	.84		.04	.31	.04	.42	.42	.35
30	5.15	440	.90	.92		.11	.28	.04	.28	.44	.34
31	5.30	446	.92	.97		.37	.35	.03	.38	.32	.36
32	5.45	460	.98	.96		.66	.38	.04	.55	.42	.35
33	6.00	460	.94	.90		.30	.36	.05	.50	.28	.30
TOTAL											
AVERAGE											

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO.            PLANT            DATE           

SHEET NO.   4   B READINGS TAKEN BY           

NUMBER	TIME	TEMP. OF FLUE GASES MARINES	DRAFT AT BOILER		DAMPER	DRAFT OVER FIRE MARINES LOWER GRATE			DRAFT OVER FIRE MARINES UPPER GRATE		
			#1	#2		#3	1	2	3	1	2
1	6.15	443	.90	.98		.38	.17	.12	.36	.32	.30
2	6.30	446	.92	.98		.32	.28	.04	.44	.43	.44
3	6.45	445	.94	.97		.12	.21	.04	.31	.36	.36
4	7.00	440	.98	.95		.19	.21	.02	.26	.36	.42
5	7.15	450	.94	.98		.16	.25	.04	.36	.42	.37
6	7.30	458	.92	.94		.11	.26	.03	.31	.32	.43
7	7.45	460	.98	.93		.19	.23	.03	.38	.37	.39
8	8.00	460	.98	.97		.10	.14	.03	.36	.42	.40
9	8.15	460	.81	.83		.16	.16	.04	.38	.41	.38
10	8.30	460	.78	.77		.12	.14	.03	.37	.36	.46
11	8.45	458	.79	.81		.10	.04	.02	.38	.37	.40
12	9.00	460	.90	.88		.09	.14	.04	.41	.40	.43
13	9.15	450	.94	.85		.40	.40	.02	.46	.38	.46
14	9.30	420	.84	.72		.45	.38	.02	.38	.32	.32
15	9.45	440	.87	.85		.34	.42	.03	.42	.36	.45
16	10.00	440	.87	.86		.31	.32	.02	.42	.37	.46
17	10.15	440	.77	.82		.09	.19	.05	.16	.34	.43
18	10.30	440	.85	.87		.22	.22	.02	.38	.34	.47
19	10.45	450	.95	.96		.43	.35	.02	.47	.43	.49
20	11.00	440	.96	.93		.17	.29	.01	.41	.42	.52
21	11.15	440	.90	.78		.23	.18	.02	.37	.38	.51
22	11.30	440	.92	.85		.16	.24	.01	.40	.43	.52
23	11.45	450	.85	.87		.12	.17	.02	.32	.37	.43
24	12.00	420	.89	.89		.24	.25	.04	.42	.42	.43
25	12.15	420	.85	.90		.12	.20	.05	.43	.45	.34
26	12.30	460	.86	.88		.21	.23	.04	.45	.47	.40
27	12.45	550	.92	.98		.18	.18	.05	.44	.42	.38
28	1.00	526	.94	.96		.12	.06	.01	.39	.44	.42
29	1.15	565	.84	.92		.04	.29	.03	.38	.36	.39
30	1.30	575	.96	.82		.33	.20	.04	.37	.33	.33
31	1.45	555	.81	.92		.28	.35	.04	.38	.42	.37
32	2.00	535	.95	.90		.27	.46	.04	.37	.44	.35
33	2.16	556	.96	.94		.22	.35	.02	.37	.44	.47
TOTAL											
AVERAGE											

REMARKS: - ⊕ MERCURY PYROMETER



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO. 4 C READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	TEMP. OF FLYE GASES MARINES	DRAFT AT BOILER DAMPER			DRAFT OVER FIRE MARINES LOWER GRATE			DRAFT OVER FIRE MARINES UPPER GRATE		
			#1	#2	#3	#1	#2	#3	#4	#5	#8
1	2.30	545	.93	.89		.11	.33	.04	.37	.40	.40
2	3.45	555	.96	.87		.15	.17	.04	.33	.33	.37
3	3.10	565	.85	.87		.22	.14	.02	.42	.37	.34
4	3.15	550	.99	.91		.08	.09	.03	.38	.42	.53
5	3.30	550	.99	.85		.12	.20	.02	.45	.40	.52
6	3.40	530	.80	.85		.12	.17	.02	.43	.45	.58
7	4.00	550	.90	.91		.13	.20	.02	.40	.42	.46
8	4.15	556	.99	.94		.09	.19	.02	.43	.46	.46
9	4.30	545	.99	.90		.08	.16	.02	.38	.40	.50
10	4.45	525	.92	.97		.05	.06	.01	.43	.45	.45
11	5.10	500	.97	.96		.09	.11	.02	.37	.43	.52
12	5.15	550	.99	.93		.20	.21	.04	.31	.37	.50
13	5.30	550	.98	.85		.26	.46	.03	.38	.40	.54
14	5.45	560	.96	.87		.16	.17	.02	.37	.36	.51
15	6.00	565	.92	.91		.18	.23	.01	.40	.38	.47
16	6.15	550	.98	.87		.17	.23	.06	.42	.43	.49
17	6.30	552	.99	.89		.12	.27	.06	.39	.38	.52
18	6.45	555	.98	.94		.20	.22	.05	.42	.44	.47
19	7.00	550	.96	.89		.12	.26	.03	.43	.38	.52
20	7.15	550	.99	.98		.11	.17	.02	.46	.49	.54
21	7.30	515	.93	.94		.12	.21	.02	.42	.51	.56
22	7.45	475	.94	.87		.09	.09	.03	.45	.42	.46
23	8.00	495	.81	.84		.10	.17	.02	.37	.30	.49
24	8.15	600	.99	.93		.15	.37	.04	.22	.40	.32
25	8.30	550	.93	.98		.30	.35	.02	.47	.41	.56
26	8.45	545	.94	.97		.20	.31	.01	.34	.45	.63
27	9.00	505	.96	.96		.34	.39	.01	.40	.42	.61
28	9.15	525	.98	.91		.25	.34	.01	.39	.43	.61
29	9.30	550	.89	.92		.21	.27	.11	.36	.42	.47
30	9.45	550	.98	.94		.27	.43	.02	.39	.49	.57
31	10	560	.94	.88		.22	.36	.03	.37	.44	.38
32											
33											
<b>TOTAL</b>											
<b>AVERAGE</b>		541.0	.93	.90		.70	.22	.03	.39	.39	.44

~~20 569~~      ~~90.24~~      ~~88.15~~  
 + 1943      2198      2.89      31.98      31.65      25.15

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE MAR. 23 1914

SHEET NO. 6 A READINGS TAKEN BY Erving Stealow

5 X

NUMBER	TIME	STIRLINGS				TEMP. OF ESCAPING GASES	TEMP. OF STEAM (CALORIMETER)	HEIGHT OF WATER IN GAUGE GLASS STIRLINGS			
		DRAFT #1	DRAFT #2	DRAFT #3	DRAFT #4			#1	#2	#3	#4
1	10.	.53	.48	.49	.48	750°	258°				
2	10.15	.50	.47	.47	.47	770°	262°				
3	10.30	.50	.44	.53	.53	750°	266°				
4	10.45	.50	.47	.51	.52	790°	264°				
5	11.	.48	.46	.47	.47	800°	228*				
6	11.15	.50	.46	.49	.50	810°	260°				
7	11.30	.45	.48	.49	.52	795°	274°				
8	11.45	.53	.50	.48	.47	760°	274°				
9	12.	.49	.47	.48	.48	790°	278°				
10	12.15	.50	.47	.49	.49	800°	278°				
11	12.30	.53	.51	.52	.52	755°	278°				
12	12.45	.52	.50	.51	.50	785°	280°				
13	1.	.42	.40	.42	.43	725°	282°				
14	1.15	.48	.45	.43	.45	715°	282°				
15	1.30	.41	.41	.53	.53	745°	282°				
16	1.45	.52	.49	.53	.44	785°	280°				
17	2.	.53	.50	.53	.47	765°	280°				
18	2.15	.52	.50	.53	.53	795°	280°				
19	2.30	.46	.41	.53	.53	795°	282°				
20	2.45	.52	.47	.52	.53	790°	282°				
21	3.	.54	.41	.45	.49	710°	282°				
22	3.15	.47	.45	.56	.46	780°	282°				
23	3.30	.43	.42	.46	.47	715°	282°				
24	3.45	.46	.48	.49	.51	770°	282°				
25	4.	.41	.40	.42	.49	780°	280°				
26	4.15	.47	.44	.45	.50	790°	278°				
27	4.30	.48	.48	.48	.50	810°	282°				
28	4.45	.50	.43	.49	.49	800°	276°				
29	5.	.50	.47	.47	.50	815°	278°				
30	5.15	.50	.41	.45	.43	830°	278°				
31	5.30	.48	.40	.49	.48	850°	278°				
32	5.45	.47	.43	.47	.47	825°	284°				
33	6.	.45	.44	.46	.45	815°	282°				
TOTAL AVERAGE											

REMARKS: - \* ASBESTOS PUT ON SAMPLE PIPE



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE MAR. 23 1916

SHEET NO. 6 B READINGS TAKEN BY *Erving Stalow*

NUMBER	TIME	STIRLING'S				TEMP. OF ESCAPING GASES	TEMP. OF STEAM CALORIMETER	HEIGHT OF WATER IN GAUGE GLASS STIRLING'S				
		DRAFT #1	AT #2	BOILER #3	DAMPER #4			#1	#2	#3	#4	
1	6.15	.48	.40	.45	.43	790°	282°					
2	6.30	.47	.39	.48	.48	795°	282°					
3	6.45	.54	.48	.47	.51	775°	280°					
4	7	.52	.47	.51	.51	775°	280°					
5	7.15	.53	.49	.50	.47	760°	280°					
6	7.30	.46	.39	.46	.52	805°	280°					
7	7.45	.47	.40	.45	.46	800°	280°					
8	8.	.47	.41	.46	.45	800°	282°					
9	8.15	.50	.42	.46	.46	755°	282°					
10	8.30	.45	.42	.42	.48	770°	282°					
11	8.45	.50	.48	.44	.45	775°	282°					
12	9	.49	.46	.46	.46	770°	280°					
13	9.15	.48	.41	.48	.50	805°	280°					
14	9.30	.50	.46	.42	.41	795°	278°					
15	9.45	.49	.46	.53	.42	875°	278°					
16	10	.48	.44	.50	.50	815°	280°					
17	10.15	.47	.44	.45	.40	900°	280°					
18	10.30	.44	.45	.48	.49	795°	280°					
19	10.45	.45	.46	.48	.48	810°	280°					
20	11.	.49	.39	.45	.40	785°	284°					
21	11.15	.46	.47	.42	.48	770°	284°					
22	11.30	.50	.49	.50	.49	770°	282°					
23	11.45	.42	.43	.44	.47	750°	282°					
24	12	.47	.45	.47	.42	770°	280°					
25	12.15	.52	.50	.47	.48	765°	282°					
26	12.30	.52	.50	.50	.50	770°	280°					
27	12.45	.50	.48	.51	.50		290°					
28	1	.47	.45	.51	.50		282°					
29	1.15	.46	.43	.48	.48		282°					
30	1.30	.45	.45	.46	.47		280°					
31	1.45	.42	.43	.48	.48		282°					
32	2.	.50	.46	.50	.49		280°					
33	2.15	.50	.45	.49	.48		280°					
TOTAL						46035						
AVERAGE						780						

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE MAR. 23 1916

SHEET NO. 6 C READINGS TAKEN BY *Erving Stealow*

7

NUMBER	TIME	STIRLINGS				TEMP OF ESCAPING GASES	TEMP OF STEAM CALORIMETER	HEIGHT OF WATER IN GLASS STIRLINGS			
		DRAFT #1	AT #2	BOILER #3	DAMPER #4			#1	#2	#3	#4
1	2.30	.49	.41	.51	.49		280°				
2	2.45	.52	.49	.53	.46		282°				
3	3.	.50	.46	.50	.48		282°				
4	3.15	.52	.46	.52	.47		282°				
5	3.30	.50	.42	.49	.49		282°				
6	3.45	.55	.47	.50	.48		282°				
7	4.	.50	.48	.50	.45		282°				
8	4.15	.50	.46	.49	.45		284°				
9	4.30	.48	.45	.51	.48		284°				
10	4.45	.48	.43	.47	.48		282°				
11	5.	.50	.49	.55	.52		280°				
12	5.15	.44	.46	.46	.47		282°				
13	5.30	.53	.51	.52	.51		282°				
14	5.45	.48	.41	.49	.49		284°				
15	6.	.44	.38	.48	.47		282°				
16	6.15	.48	.45	.48	.48		282°				
17	6.30	.48	.44	.47	.47		282°				
18	6.45	.49	.45	.48	.41		284°				
19	7.	.43	.35	.44	.44		284°				
20	7.15	.45	.43	.44	.43		284°				
21	7.30	.51	.46	.48	.50		282°				
22	7.45	.45	.45	.48	.46		282°				
23	8.	.47	.46	.48	.48		280°				
24	8.15	.45	.47	.46	.47		282°				
25	8.30	.55	.47	.50	.51		280°				
26	8.45	.56	.55	.55	.53		280°				
27	9.	.51	.48	.51	.49		282°				
28	9.15	.51	.50	.53	.53		280°				
29	9.30	.49	.50	.50	.48		282°				
30	9.45	.52	.43	.52	.53		280°				
31	10.	.51	.50	.50	.51		280°				
32		47.14	43.75	47.03	46.48						
33											
TOTAL							24180				
AVERAGE		.49	.45	.48	.48		281				

REMARKS:-



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE MAY 23, 1911

SHEET NO. 3A READINGS TAKEN BY MATT KUNTZ

8 29

NUMBER	TIME	STIRLINGS DRAFT OVER FIRE				STIRLINGS DRAFT IN ASH PIT			
		#1	#2	#3	#4	#1	#2	#3	#4
1	10:00 AM	.30	.28	.41	.38	.10	.11	.25	.07
2	10:15	.31	.34	.43	.36	.11	.08	.08	.05
3	10:30	.42	.36	.40	.38	.08	.10	.09	.06
4	10:45	.35	.28	.39	.39	.11	.11	.08	.03
5	11:00	.25	.26	.34	.31	.15	.09	.13	.09
6	11:15	.25	.29	.33	.30	.14	.07	.14	.10
7	11:30	.38	.28	.36	.36	.10	.09	.09	.07
8	11:45	.37	.38	.36	.38	.10	.05	.11	.08
9	12:00	.30	.27	.36	.32	.12	.10	.10	.09
10	12:15	.28	.24	.32	.35	.12	.10	.08	.05
11	12:30	.32	.31	.36	.38	.10	.08	.22	.08
12	12:45	.30	.27	.33	.30	.05	.09	.10	.08
13	1 P.M.	.30	.27	.38	.28	.10	.18	.27	.17
14	1:15	.33	.29	.34	.36	.09	.08	.25	.09
15	1:30	.38	.32	.45	.32	.10	.10	.14	.28
16	1:45	.28	.30	.50	.39	.11	.08	.06	.10
17	2:00	.36	.33	.41	.34	.11	.04	.15	.11
18	2:15	.33	.25	.44	.41	.09	.14	.10	.13
19	2:30	.25	.25	.46	.45	.18	.13	.09	.16
20	2:45	.30	.25	.40	.39	.22	.12	.15	.12
21	3:00	.35	.33	.45	.39	.08	.09	.12	.11
22	3:15	.34	.36	.42	.35	.11	.10	.12	.11
23	3:30	.39	.42	.38	.32	.14	.17	.14	.12
24	3:45	.34	.34	.35	.32	.10	.25	.15	.12
25	4:00	.34	.29	.32	.34	.11	.19	.13	.13
26	4:15	.33	.27	.33	.38	.11	.15	.13	.09
27	4:30	.36	.27	.36	.31	.09	.09	.15	.15
28	4:45	.37	.37	.38	.38	.10	.16	.12	.11
29	5:00	.31	.38	.38	.35	.12	.14	.19	.13
30	5:15	.34	.29	.34	.35	.12	.12	.16	.10
31	5:30	.33	.28	.37	.36	.15	.15	.19	.12
32	5:45	.38	.28	.36	.32	.17	.07	.15	.15
33	6:00	.31	.30	.40	.33	.14	.12	.15	.11
<b>TOTAL AVERAGE</b>									

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE March 23-24, 1916

SHEET NO 3B READINGS TAKEN BY MATZ KUNZ

NUMBER	TIME	STIRLINGS DRAFT OVER FIRE				DRAFT IN ASH PIT STIRLINGS			
		#1	#2	#3	#4	#1	#2	#3	#4
1	6.15	.28	.25	.38	.35	.15	.17	.15	.15
2	6.30	.33	.30	.42	.35	.14	.15	.15	.17
3	6.45	.31	.35	.45	.37	.15	.25	.10	.12
4	7.00	.40	.32	.41	.30	.15	.13	.13	.15
5	7.15	.43	.31	.39	.34	.10	.12	.10	.11
6	7.30	.36	.30	.38	.41	.14	.08	.05	.12
7	7.45	.33	.30	.30	.30	.14	.16	.11	.09
8	8.00	.26	.30	.30	.25	.23	.13	.16	.15
9	8.15	.35	.29	.40	.33	.12	.12	.18	.20
10	8.30	.33	.19	.27	.29	.11	.13	.25	.14
11	8.45	.33	.31	.38	.31	.11	.11	.12	.18
12	9.00	.35	.34	.40	.32	.07	.11	.18	.12
13	9.15	.35	.30	.30	.35	.08	.12	.18	.12
14	9.30	.37	.32	.30	.38	.10	.12	.13	.15
15	9.45	.34	.20	.30	.31	.08	.08	.15	.15
16	10.00	.32	.33	.34	.30	.08	.09	.17	.11
17	10.15	.11	.11	.36	.31	.06	.04	.17	.17
18	10.30	.29	.29	.35	.30	.15	.11	.12	.12
19	10.45	.31	.18	.32	.33	.18	.12	.15	.14
20	11.00	Cleaning fires		.35	.29	cleaning fires		.11	.15
21	11.15	"	"	.31	.30	"	"	.18	.16
22	11.30	"	"	.41	.35	"	"	.12	.15
23	12.45	.32	.22	.38	.32	.15	.19	.12	.08
24	12.00	.29	.24	.39	.32	.13	.14	.11	.11
25	12.12	.24	.34	.40	.38	.13	.09	.09	.10
26	12.30	.34	.29	.41	.33	.08	.08	.14	.12
27	12.45	.36	.30	.38	.33	.06	.07	.12	.12
28	1.00 AM	.32	.31	.40	.36	.06	.07	.12	.08
29	1.15	.30	.28	.38	.34	.10	.10	.10	.09
30	1.30	.22	.29	.37	.37	.07	.07	.09	.07
31	1.45	.24	.32	.36	.32	.12	.05	.10	.13
32	2.00	.30	.29	.40	.36	.09	.05	.10	.11
33	2.15	.31	.25	.38	.34	.08	.10	.10	.11
TOTAL									
AVERAGE									

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO 3C READINGS TAKEN BY MAZZKUNZ

NUMBER	TIME	STIRLINGS DRAFT OVER FIRE				STIRLINGS DRAFT IN ASH PIT			
		#1	#2	#3	#4	#1	#2	#3	#4
1	2:30	.38	.25	.43	.36	.11	.06	.09	.08
2	2:40	.25	.28	.45	.36	.11	.09	.08	.12
3	3:00	.30	.29	.40	.36	.09	.07	.11	.13
4	3:10	.34	.30	.42	.39	.07	.06	.10	.08
5	3:30	.28	.33	.43	.39	.06	.06	.10	.09
6	3:40	.40	.30	.41	.37	.05	.03	.11	.14
7	4:00	.20	.24	cleaning fires		.06	.04	cleaning fires	
8	4:10	.22	.32	"	"	.05	.05	"	"
9	4:30	.33	.28	"	"	.05	.05	"	"
10	4:40	.30	.22	"	"	.08	.08	"	"
11	5:00	.35	.37	.38	.41	.06	.04	.15	.07
12	5:10	.29	.29	.32	.32	.09	.06	.24	.21
13	5:30	.20	.32	.43	.36	.08	.07	.06	.12
14	5:40	.30	.29	.35	.31	.07	.08	.05	.06
15	6:00	.25	.20	.46	.34	.11	.11	.04	.03
16	6:10	.31	.23	.39	.34	.12	.12	.07	.10
17	6:30	.28	.22	.41	.33	.08	.08	.08	.09
18	6:40	.26	.23	.37	.34	.10	.10	.12	.12
19	7:00	cleaning	.24	.34	.30	0 fire	.02	.09	.09
20	7:10	cleaning	fires		.31	.29	cleaning	.05	.04
21	7:30	"	"	.32	.36	"	"	.09	.06
22	7:40	.36	.30	.32	.38	.08	.06	.10	.04
23	8:00	.28	.28	.32	.32	.05	.03	.10	.08
24	8:10	.31	.28	.34	.32	.10	.15	.08	.07
25	8:30	.41	.42	.39	.30	.05	.05	.05	.06
26	8:40	.38	.42	.43	.35	.09	.02	.08	.07
27	9:00	.39	.32	.37	.39	.07	.09	.10	.08
28	9:10	.34	.32	.41	.39	.11	.06	.10	.08
29	9:30	.30	.26	.41	.38	.06	.07	.08	.07
30	9:40	.30	.30	.39	.38	.12	.06	.09	.08
31	10:00	.33	.35	.40	.37	.05	.06	.11	.09
32		<del>28.88</del>	<del>26.81</del>	<del>35.16</del>	<del>32.11</del>	<del>9.59</del>	<del>9.10</del>	<del>11.30</del>	<del>10.38</del>
33									
TOTAL		91	92	93	93	91	92	93	93
AVERAGE		.32	.29	.38	.35	.10	.10	.12	.11

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT -----

BOILER No -----

DATE -----

SHEET No 1 -----

READINGS TAKEN BY -----

NUMBER	TIME	COAL FOR STIRLINGS		COAL FOR MARINES				
		I1	I2	I3	I4	I1	I2	I3
1	10:00				200	200		
2	10:02				200	200		
3	10:03				200	200		
4	10:05				200	200		
5	10:07				200	200		
6	10:09				200	200		
7	10:10				200	200		
8	10:13				200	200		
9	10:15				200	200		
10	10:17				200	11AM		
11					200	200		
12					200	200		
13					200	200		
14					200	200		
15					200	200	12AM	
16						200		
17						200		
18						200		
19						200	1PM	
20					200	200		
21					200	200		
22					200	200		
23					200	200		
24					200	200		
25					200	200		
26					200	200		
27					200	200		
28						200	2PM	
29					200	200		
30					200	200		
31					200	200		
32					200	200		
33					200	200	3PM	
TOTAL								
AVERAGE								

REMARKS:- -----



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT \_\_\_\_\_

BOILER No \_\_\_\_\_

DATE \_\_\_\_\_

SHEET No \_\_\_\_\_

21

READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	Stirling #4	Marine #1	Stirling #4	Marine #1		Stirling #4	Marine #1
1		200	200	200	200		200	200
2		200	200	200	200		200	200
3		200	200	200	200		200	200
4		200	200	200	200		200	200
5		200	200	200	200		200	200
6		200	200		200		200	200
7		200	200		200	9PM	200	200
8	4PM		200	200	200		200	200
9		200	200	200	200		200	200
10		200	200	200	200		200	200
11		200	200	200	200			200
12		200	200	200	200		200	200
13	5PM		200	200			200	200
14		200	200	200			200	200
15		200	200	200		10PM	200	200
16		200	200	200	200			200
17		200	200	200	200			200
18		200	200	200	200			200
19	6PM	200		200	200		200	200
20		200	200	200	200		200	200
21		200	200	200			200	200
22		200	200	200		11PM	200	200
23		200	200	200	200		200	200
24		200	200	200	200			200
25		200	200	200	200			200
26	7PM		200	200	200		200	200
27		200	200	200	200		200	200
28		200	200		200		200	200
29		200	200		200	12:00	200	200
30		200	200	200	200		200	200
31		200	200	200	200			
32			200	200	200			
33	9PM		200	200	200			
TOTAL								
AVERAGE								

REMARKS:- \_\_\_\_\_



# COPPER RANGE COMPANY

LOG OF BOILER TRIAL AT \_\_\_\_\_

BOILER NO \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO \_\_\_\_\_ READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	Stirling #4	Marines #1			
1		200	200			
2		200	200			
3		200	200			
4		200	200			
5		200	200			
6			200			
7	6AM		200			
8		200	200			
9		200	200			
10		200	200			
11		200	200			
12		200	200			
13		200	200			
14			200			
15			200			
16	7AM		200			
17		200	200			
18		200	200			
19		200	200			
20		200	200			
21		200	200			
22		200				
23	8AM	200				
24		200	200			
25		200	200			
26	9AM	200				
27		200	200			
28		200	200			
29		200	200			
30		200	200			
31		200	200			
32	10AM		200			
33						
TOTAL						
AVERAGE						

REMARKS:- \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER No. PLANT DATE \_\_\_\_\_

SHEET No. COAL - L READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	COAL FOR STIRLINGS				COAL FOR MARINES		
		#1	#2	#3	#4	#1	#2	#3
1	10 am	200						200
2		200						200
3		200						200
4		200						200
5		200						200
6		200						200
7		200						200
8		200					11 am	200
9		200						200
10	11 am	200						200
11		200						200
12		200						200
13		200					12	200
14		200						200
15		200						200
16		200						200
17	12	200						200
18		200						200
19		200					1 pm	200
20		200						200
21		200						200
22		200						200
23		200						200
24	1 pm	200					2 pm	200
25		200						200
26		200						200
27		200						200
28		200						200
29		200					3 pm	200
30		200						200
31	2 pm	200						200
32		200						200
33		200						200
TOTAL		200						
AVERAGE								

REMARKS:- \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO. COAL 2 READINGS TAKEN BY \_\_\_\_\_

~~COAL 2~~

NUMBER	TIME	COAL				
		# 1 STIRLING	# 3 MARINE			
1		200	200			
2		200	200			
3		200	200			
4		200	200	4 P.M.		
5		200	200			
6	4 P.M.	200	200			
7		200	200			
8		200	200			
9		200	200	5 P.M.		
10		200	200			
11		200	200			
12		200	200			
13		200	200			
14		200	200	6 P.M.		
15	5 P.M.	200	200			
16		200	200			
17		200	200			
18		200	200			
19	6 P.M.	200	200	7 P.M.		
20		200	200			
21		200	200			
22		200	200			
23		200	200			
24		200	200	8 P.M.		
25	7 P.M.	200				
26		200				
27		200				
28		200				
29		200				
30		200				
31		200				
32	8 P.M.	200				
33						
TOTAL						
AVERAGE						

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE \_\_\_\_\_

SHEET NO. COAL-3 READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME	COAL	N <sup>o</sup> 3	STIRLING #1	MARINE	#1	N <sup>o</sup> 3
		#/STIRLING	MARINE		#/MARINE		#/N <sup>o</sup> 3
1		200	200	200	200	200	200
2		200	200	200	200	200	200
3		200	200	200	200	7 AM 200	200
4		200	200	200	200 2 AM	200	200
5		200	200	200	200	200	200
6	9 P.M.	200	200	200	200	200	200 2 AM
7		200	200	200	200	200	200
8		200	200	200	200	200	200
9		200	200	200	200 3 AM	200	200
10	10 P.M.	200	200 10 AM	200	200	8 AM 200	200
11		200	200	200	200	200	200
12		200	200	200	200	200	200
13		200	200	200	200	200	200
14	11 P.M.	200	200	200	200	200	200
15		200	200 11 AM	200	200 4 AM	200	200 9 AM
16		200	200	200	200	200	200 10
17		200	200	200	200	9 AM 200	200
18		200	200 12	200	200	200	200
19		200	200	200	200	10 200	200
20		200	200	200	200 5 AM	200	200
21	12	200	200	200	200	200	200
22		200	200	200	200	200	200
23		200	200	200	200	200	200
24		200	200	200	200 6 AM	200	200
25		200	200 1 AM	200	200 5 AM	200	200
26		200	200	200	200	200	200
27		200	200	200	200	200	200
28		200	200	200	200	200	200
29		200	200	200	200	200	200
30		200	200	200	200	200	200
31	1 AM	200	200	200	200	200	200
32							
33							
TOTAL							
AVERAGE							

REMARKS:-

Net 1/68     Net 2     No 3     207 1/2 inches



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER No \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET No WATER - 1A READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER
1	10. -	10. 2	140	34	11. 59	11. 59	139	68	1. 56	1. 58	142
2	10. 3	10. 4	140	35	12. 1	12. 3	138	69	1. 59	2. 1	144
3	10. 7	10. 10	142	36	12. 5	12. 6	119	70	2. 3	2. 4	142
4	10. 13	10. 15	142	37	12. 8	12. 9	115	71	2. 6	2. 7	145
5	10. 18	10. 20	143	38	12. 11	12. 12	116	72	2. 9	2. 10	147
6	10. 22	10. 24	142	39	12. 15	12. 16	118	73	2. 12	2. 14	145
7	10. 26	10. 28	142	40	12. 18	12. 19	121	74	2. 16	2. 18	145
8	10. 30	10. 32	142	41	12. 22	12. 23	122	75	2. 19	2. 21	145
9	10. 34	10. 35	142	42	12. 25	12. 27	137	76	2. 23	2. 24	144
10	10. 37	10. 38	142	43	12. 29	12. 30	136	77	2. 26	2. 28	144
11	10. 40	10. 42	142	44	12. 32	12. 34	141	78	2. 30	2. 31	142
12	10. 44	10. 46	142	45	12. 36	12. 37	139	79	2. 33	2. 34	142
13	10. 48	10. 49	141	46	12. 39	12. 40	139	80	2. 36	2. 38	143
14	10. 51	10. 53	141	47	12. 42	12. 43	142	81	2. 40	2. 41	144
15	10. 55	10. 57	141	48	12. 45	12. 46	140	82	2. 43	2. 45	145
16	10. 59	11. -	142	49	12. 48	12. 49	139	83	2. 47	2. 48	144
17	11. 2	11. 3	141	50	12. 51	12. 52	138	84	2. 51	2. 52	144
18	11. 5	11. 7	142	51	12. 54	12. 56	140	85	2. 54	2. 56	145
19	11. 9	11. 10	142	52	12. 58	12. 59	139	86	2. 58	2. 59	145
20	11. 12	11. 13	141	53	1. 01	1. 03	138	87	3. 1	3. 2	144
21	11. 15	11. 16	141	54	1. 05	1. 08	139	88	3. 4	3. 6	142
22	11. 18	11. 20	141	55	1. 10	1. 12	142	89	3. 7	3. 9	143
23	11. 22	11. 24	141	56	1. 13	1. 15	147	90	3. 11	3. 12	140
24	11. 26	11. 27	142	57	1. 16	1. 18	152	91	3. 14	3. 16	140
25	11. 29	11. 30	141	58	1. 20	1. 22	160	92	3. 18	3. 19	141
26	11. 31	11. 33	142	59	1. 23	1. 25	156	93	3. 21	3. 22	142
27	11. 36	11. 37	142	60	1. 27	1. 29	152	94	3. 24	3. 26	142
28	11. 39	11. 40	142	61	1. 31	1. 32	150	95	3. 28	3. 29	137
29	11. 42	11. 43	140	62	1. 34	1. 36	147	96	3. 31	3. 32	140
30	11. 45	11. 46	142	63	1. 38	1. 40	147	97	3. 34	3. 36	140
31	11. 48	11. 49	140	64	1. 42	1. 44	145	98	3. 38	3. 39	140
32	11. 51	11. 53	140	65	1. 46	1. 48	147	99	3. 41	3. 42	135
33	11. 55	11. 56	142	66	1. 49	1. 50	145	100	3. 44	3. 46	137
TOTAL				67	1. 52	1. 54	143				
AVERAGE											

REMARKS: - From top of tank to water 23"



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO WATER-LB READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK
101	3.48	3.50	137	134	5.39	5.40	142	168	7.27	7.28	141
102	3.51	3.54	140	135	5.42	5.44	148	169	7.30	7.31	142
103	3.56	3.57	142	136	5.45	5.47	143	170	7.33	7.34	139
104	3.59	4.00	140	137	5.49	5.50	145	171	7.36	7.37	139
105	4.02	4.03	145	138	5.52	5.53	146	172	7.39	7.40	142
106	4.05	4.07	141	139	5.55	5.56	144	173	7.42	7.43	142
107	4.09	4.10	142	140	5.58	6.00	140	174	7.46	7.47	140
108	4.12	4.13	143	141	6.02	6.03	140	175	7.49	7.50	140
109	4.15	4.17	140	142	6.05	6.06	140	176	7.53	7.54	143
110	4.19	4.20	137	143	6.08	6.09	134	177	7.56	7.57	139
111	4.22	4.23	142	144	6.11	6.12	131	178	7.59	8.00	145
112	4.25	4.27	146	145	6.14	6.15	135	179	8.02	8.04	144
113	4.28	4.30	143	146	6.17	6.18	133	180	8.06	8.07	140
114	4.32	4.34	148	147	6.20	6.21	136	181	8.10	8.11	146
115	4.36	4.37	144	148	6.23	6.24	137	182	8.13	8.15	142
116	4.39	4.41	148	149	6.27	6.28	134	183	8.17	8.19	146
117	4.43	4.44	145	150	6.30	6.31	138	184	8.21	8.22	155
118	4.46	4.47	147	151	6.33	6.34	140	185	8.25	8.26	157
119	4.50	4.51	147	152	6.36	6.37	139	186	8.29	8.30	154
120	4.53	4.55	146	153	6.39	6.40	140	187	8.33	8.35	148
121	4.57	4.58	147	154	6.43	6.44	141	188	8.37	8.38	142
122	5.00	5.01	147	155	6.46	6.47	140	189	8.41	8.42	146
123	5.03	5.04	148	156	6.50	6.51	140	190	8.45	8.46	149
124	5.06	5.07	143	157	6.53	6.54	139	191	8.48	8.49	145
125	5.09	5.11	140	158	6.56	6.57	139	192	8.53	8.54	140
126	5.13	5.14	144	159	6.59	7.00	142	193	8.56	8.57	141
127	5.16	5.18	145	160	7.02	7.03	141	194	8.59	9.00	140
128	5.19	5.21	139	161	7.05	7.06	137	195	9.02	9.03	140
129	5.23	5.24	140	162	7.08	7.09	145	196	9.05	9.07	142
130	5.26	5.27	141	163	7.11	7.12	140	197	9.10	9.11	142
131	5.29	5.31	146	164	7.14	7.15	140	198	9.14	9.15	142
132	5.33	5.35	144	165	7.17	7.18	143	199	9.16	9.17	142
133	5.36	5.37	145	166	7.20	7.21	140	200	9.20	9.21	140
TOTAL				167	7.23	7.24	139				
AVERAGE											

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE \_\_\_\_\_

SHEET NO. WATER-16 READINGS TAKEN BY \_\_\_\_\_

NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK
21	9.24	9.26	140	234	11.15	11.16	139	269	1.10	1.11	139
22	9.28	9.30	144	235	11.18	11.20	140	270	1.13	1.15	140
23	9.32	9.34	144	236	11.22	11.23	140	271	1.17	1.18	139
24	9.36	9.38	140	237	11.24	11.26	139	272	1.20	1.21	141
25	9.40	9.41	142	238	11.25	11.29	137	273	1.23	1.24	139
26	9.43	9.44	142	239	11.31	11.32	138	274	1.26	1.27	139
27	9.46	9.47	145	240	11.34	11.35	138	275	1.29	1.30	140
28	9.49	9.50	145	241	11.37	11.38	139	276	1.32	1.33	139
29	9.52	9.54	142	242	11.40	11.41	137	277	1.35	1.36	139
30	9.55	9.56	144	243	11.43	11.45	138	278	1.38	1.39	139
31	9.59	10. -	144	244	11.46	11.49	137	279	1.41	1.42	140
32	10.2	10.3	144	245	11.50	11.52	140	280	1.44	1.45	138
33	10.5	10.6	143	246	11.54	11.56	139	281	1.47	1.48	139
34	10.8	10.9	142	247	11.58	12. -	140	282	1.49	1.50	138
35	10.12	10.14	144	248	12.2	12.3	140	283	1.52	1.53	138
36	10.15	10.16	142	249	12.5	12.6	147	284	1.55	1.56	139
37	10.18	10.19	147	250	12.8	12.10	144	285	1.58	2. -	138
38	10.21	10.23	148	251	12.12	12.13	140	286	2.1	2.2	139
39	10.25	10.26	147	252	12.15	12.16	140	287	2.4	2.5	138
40	10.28	10.30	147	253	12.18	12.19	140	288	2.7	2.8	139
41	10.32	10.34	145	254	12.21	12.22	140	289	2.10	2.11	139
42	10.36	10.37	144	255	12.24	12.25	138	290	2.13	2.14	136
43	10.39	10.41	144	256	12.27	12.28	139	291	2.16	2.17	139
44	10.43	10.45	142	257	12.30	12.31	140	292	2.19	2.20	138
45	10.47	10.48	140	258	12.33	12.34	138	293	2.22	2.23	137
46	10.50	10.51	144	259	12.36	12.37	139	294	2.24	2.25	138
47	10.54	10.55	142	260	12.40	12.41	139	295	2.27	2.28	136
48	10.56	10.57	142	261	12.43	12.44	140	296	2.30	2.31	139
49	10.59	11. -	140	262	12.45	12.48	140	297	2.33	2.34	138
50	11.2	11.3	138	263	12.50	12.51	140	298	2.36	2.37	137
51	11.5	11.6	142	264	12.53	12.55	138	299	2.39	2.40	137
52	11.8	11.10	140	265	12.56	12.58	140	300	2.42	2.43	137
53	11.12	11.13	139	266	12.59	1.1	140	301	2.45	2.47	139
TOTAL				267	1.3	1.5	139	302	2.49	2.49	136
AVERAGE				268	1.7	1.8	138	303	2.51	2.52	139

REMARKS:-







# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE \_\_\_\_\_

SHEET NO. WATER READINGS TAKEN BY \_\_\_\_\_

NO 1 TANK

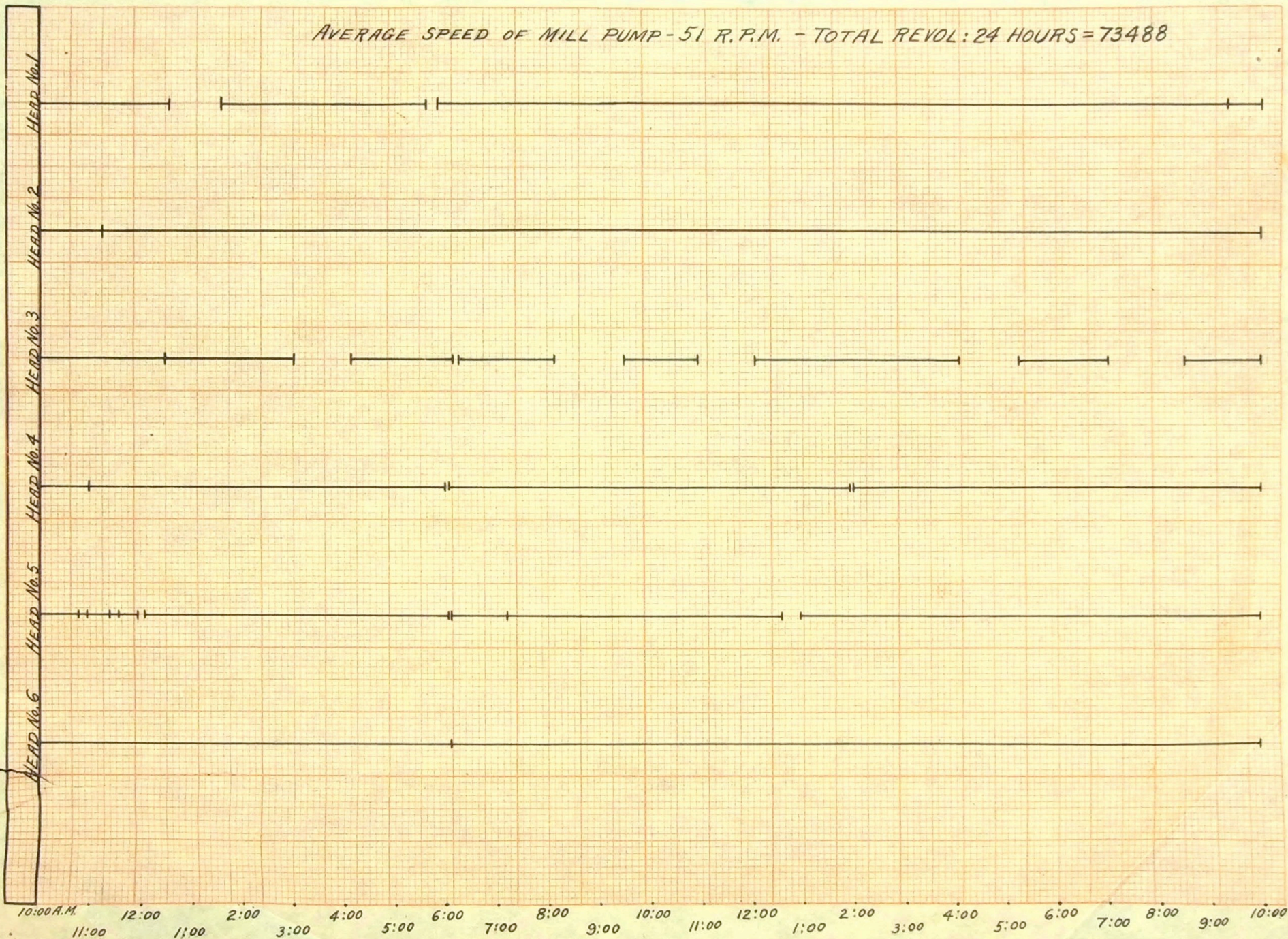
NUMBER	TIME FILLED	TIME EMPTY	TEMPERATURE OF WATER	REMARKS	REMARKS
1	8.18	8.20	159		
2	8.22	8.23	150		
3	8.25	8.26	145		
4	8.28	8.29	142		
5	8.31	8.33	140		
6	8.35	8.36	139		
7	8.38	8.39	138		
8	8.41	8.42	141		
9	8.44	8.46	139		
10	8.48	8.49	142		
11	8.51	8.52	139		
12	8.55	8.56	143		
13	8.58	8.59	140		
14	9.1	9.2	139		
15	9.4	9.6	142		
16	9.8	9.9	141		
17	9.11	9.12	140		
18	9.14	9.15	138		
19	9.18	9.19	138		
20	9.21	9.22	138		
21	9.24	9.26	137		
22	9.28	9.29	137		
23	9.31	9.32	140		
24	9.35	9.37	140		
25	9.38	9.40	139		
26	9.42	9.43	140		
27	9.45	9.47	140		
28	9.49	9.50	137		
29	9.52	9.54	141		
30	9.55	9.56	140		
31	9.58	10 -	140		
32					
33					
<b>TOTAL</b>			6178		
<b>AVERAGE</b>			141		

REMARKS: *From top of tanks to water 8 1/2" last tank*



# CHAMPION MILL - LOG OF OPERATION OF STAMPS AND MILL PUMP

AVERAGE SPEED OF MILL PUMP - 51 R.P.M. - TOTAL REVOL: 24 HOURS = 73488



CHICAGO - NEW YORK

No 285

THE FREDERICK POSTER



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO. WATER-2A READINGS TAKEN BY J. Linnville & A. Mitchell

NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK
1	10:00	10:02	140	34	12:21	12:24	132	68	2:57	2:58	142
2	10:04	10:05	140	35	12:26	12:32	140	69	3:00	3:02	140
3	10:07	10:08	140	36	12:34	12:37	142	70	3:04	3:05	142
4	10:09	10:10	140	37	12:39	12:41	142	71	3:07	3:10	140
5	10:12	10:13	130	38	12:43	12:45	142	72	3:11	3:14	150
6	10:15	10:16	140	39	12:47	12:49	142	73	3:16	3:18	150
7	10:17	10:18	142	40	12:51	12:56	140	74	3:20	3:22	142
8	10:19	10:22	138	41	12:59	1:05	144	75	3:24	3:26	148
9	10:24	10:26	140	42	1:08	1:18	150	76	3:28	3:30	144
10	10:28	10:30	142	43	1:21	1:23	158	77	3:32	3:34	142
11	10:32	10:34	142	44	1:25	1:27	150	78	3:36	3:39	142
12	10:36	10:38	140	45	1:29	1:31	140	79	3:40	3:43	144
13	10:40	10:41	140	46	1:33	1:34	140	80	3:44	3:47	144
14	10:43	10:45	140	47	1:36	1:38	140	81	3:49	3:51	142
15	10:47	10:50	144	48	1:40	1:42	142	82	3:53	3:59	140
16	10:52	10:56	144	49	1:44	1:46	142	83	4:01	4:05	146
17	10:58	11:03	142	50	1:48	1:50	140	84	4:07	4:09	142
18	11:05	11:08	144	51	1:52	1:55	140	85	4:11	4:13	140
19	11:10	11:12	150	52	1:57	1:58	150	86	4:15	4:22	140
20	11:14	11:19	144	53	2:00	2:02	150	87	4:24	4:30	144
21	11:21	11:23	150	54	2:04	2:06	150	88	4:32	4:38	150
22	11:25	11:29	150	55	2:08	2:10	144	89	4:40	4:47	152
23	11:31	11:34	148	56	2:12	2:13	146	90	4:49	4:58	150
24	11:36	11:38	142	57	2:15	2:16	144	91	4:57	5:00	150
25	11:40	11:43	150	58	2:18	2:20	142	92	5:02	5:05	150
26	11:45	11:47	144	59	2:22	2:24	144	93	5:07	5:09	150
27	11:50	11:52	146	60	2:26	2:28	144	94	5:11	5:13	144
28	11:56	11:58	144	61	2:29	2:32	144	95	5:15	5:20	142
29	12:00	12:02 PM	142	62	2:34	2:36	152	96	5:22	5:26	146
30	12:04	12:07	130	63	2:38	2:40	144	97	5:28	5:33	150
31	12:09	12:11	122	64	2:42	2:44	140	98	5:35	5:39	146
32	12:13	12:15	120	65	2:46	2:47	142	99	5:41	5:44	150
33	12:17	12:19	122	66	2:49	2:51	140	100	5:46	5:48	150
TOTAL				67	2:53	2:55	140				
AVERAGE											

REMARKS:- From top of tank to water 22" Lower tank  
 " " " " " " 5 in. upper "



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO \_\_\_\_\_ PLANT \_\_\_\_\_ DATE \_\_\_\_\_

SHEET NO WATER-2B READINGS TAKEN BY J. Guerville & A. Michel

NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP. OF WATER IN TANK
101	5:50	5:52	142	134	8:28	8:30	152	168	10:58	11:02	144
102	5:54	5:58	144	135	8:32	8:36	150	169	11:04	11:06	148
103	6:00	6:02	142	136	8:39	8:42	152	170	11:07	11:09	142
104	6:04	6:07	140	137	8:44	8:45	150	171	11:10	11:14	144
105	6:09	6:11	130	138	8:46	8:50	148	172	11:15	11:17	144
106	6:13	6:16	130	139	8:51	8:53	144	173	11:19	11:21	142
107	6:18	6:20	140	140	8:55	8:58	150	174	11:23	11:25	146
108	6:22	6:25	140	141	8:59	9:00	150	175	11:27	11:30	148
109	6:27	6:29	140	142	9:01	9:03	146	176	11:31	11:34	142
110	6:31	6:35	140	143	9:05	9:06	150	177	11:36	11:39	142
111	6:37	6:39	150	144	9:08	9:10	144	178	11:40	11:44	144
112	6:41	6:43	140	145	9:12	9:13	140	179	11:46	11:48	144
113	6:45	6:46	140	146	9:15	9:16	140	180	11:50	11:54	142
114	6:48	6:51	140	147	9:18	9:20	140	181	11:56	12:00	150
115	6:53	6:56	150	148	9:20	9:23	142	182	12:03	12:07	148
116	6:58	7:00	144	149	9:25	9:27	142	183	12:09	12:10	150
117	7:02	7:05	140	150	9:29	9:32	142	184	12:11	12:13	142
118	7:07	7:10	142	151	9:34	9:38	144	185	12:15	12:18	142
119	7:12	7:15	144	152	9:40	9:45	150	186	12:20	12:22	142
120	7:16	7:18	144	153	9:47	9:53	150	187	12:24	12:26	150
121	7:20	7:23	142	154	9:55	9:59	150	188	12:29	12:33	144
122	7:25	7:26	142	155	10:00	10:04	152	189	12:35	12:38	142
123	7:28	7:31	142	156	10:06	10:09	152	190	12:39	12:41	150
124	7:33	7:36	148	157	10:10	10:17	150	191	12:42	12:45	142
125	7:38	7:39	146	158	10:19	10:21	152	192	12:47	12:49	142
126	7:42	7:45	140	159	10:23	10:24	150	193	12:57	12:53	142
127	7:47	7:49	140	160	10:26	10:28	150	194	12:55	12:56	142
128	7:51	7:56	140	161	10:30	10:32	142	195	12:58	1:00	144
129	7:58	8:00	142	162	10:34	10:35	150	196	1:02	1:05	140
130	8:02	8:07	142	163	10:37	10:40	142	197	1:07	1:08	142
131	8:09	8:20	150	164	10:42	10:45	150	198	1:10	1:12	142
132	8:22	8:24	160	165	10:47	10:49	158	199	1:14	1:16	144
133	8:25	8:27	154	166	10:51	10:53	154	200	1:18	1:21	142
TOTAL				167	10:55	10:57	146				
AVERAGE											

REMARKS: \_\_\_\_\_



# COPPER RANGE COMPANY

## LOG OF BOILER TRIAL AT CHAMPION MILL

BOILER NO. PLANT DATE \_\_\_\_\_

SHEET NO. WATER-2C READINGS TAKEN BY J. Genville & A. Michel

NUMBER	TIME FILLED	TIME EMPTY	TEMP OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP OF WATER IN TANK	NUMBER	TIME FILLED	TIME EMPTY	TEMP OF WATER IN TANK
21	1:23	1:25	146	235	4:05	4:08	144	269	7:00	7:02	140
22	1:27	1:30	142	235	4:10	4:14	142	270	7:04	7:06	140
23	1:32	1:36	144	236	4:16	4:18	142	271	7:08	7:10	140
24	1:39	1:41	142	237	4:22	4:24	144	272	7:13	7:14	140
25	1:44	1:46	142	238	4:26	4:29	142	273	7:17	7:18	140
26	1:50	1:51	144	239	4:30	4:36	142	274	7:20	7:23	142
27	1:55	1:56	144	240	4:38	4:44	142	275	7:25	7:27	144
28	1:58	2:01	144	241	4:46	4:50	144	276	7:29	7:33	140
29	2:02	2:06	142	242	4:54	5:06	146	277	7:35	7:40	140
30	2:07	2:11	142	243	4:58	5:02	146	278	7:42	8:14	146
31	2:12	2:15	144	244	5:05	5:13	142	279	8:16	8:19	150
32	2:17	2:20	142	245	5:15	5:20	154	280	8:21	8:22	150
33	2:22	2:25	142	246	5:23	5:26	156	281	8:24	8:25	142
34	2:27	2:30	140	247	5:28	5:30	150	282	8:29	8:30	140
35	2:31	2:35	140	248	5:33	5:35	150	283	8:32	8:35	142
36	2:37	2:38	140	249	5:37	5:38	144	284	8:36	8:40	144
37	2:40	2:42	140	250	5:40	5:42	140	285	8:41	8:46	142
38	2:45	2:48	144	251	5:44	5:46	142	286	8:48	8:53	144
39	2:51	2:53	146	252	5:48	5:51	144	287	8:55	8:57	150
40	2:57	2:59	144	253	5:52	5:55	146	288	8:59	9:02	144
41	3:02	3:06	142	254	6:01	6:02	144	289	9:04	9:05	142
42	3:08	3:10	146	255	6:04	6:07	142	290	9:07	9:10	140
43	3:12	3:15	144	256	6:09	6:11	150	291	9:12	9:13	140
44	3:17	3:19	144	257	6:12	6:15	146	292	9:15	9:16	142
45	3:21	3:24	142	258	6:17	6:19	142	293	9:18	9:20	140
46	3:26	3:29	142	259	6:21	6:23	142	294	9:22	9:25	144
47	3:30	3:33	144	260	6:25	6:28	140	295	9:27	9:30	148
48	3:35	3:38	142	261	6:29	6:31	142	296	9:32	9:33	144
49	3:40	3:45	144	262	6:34	6:36	140	297	9:35	9:36	140
50	3:47	3:49	142	263	6:38	6:39	142	298	9:38	9:40	140
51	3:51	3:54	142	264	6:41	6:42	142	299	9:42	9:43	142
52	3:56	3:59	142	265	6:44	6:47	140	300	9:46	9:50	140
53	4:01	4:03	142	266	6:49	6:54	142	301	9:52	9:53	146
TOTAL				267	6:53	6:55	144	302	9:55	9:56	142
AVERAGE				268	6:57	6:58	140	303			

REMARKS:- 2-3 in from top tank to water lower tank.

43700  
144.7



# COPPER RANGE COMPANY

## CHAMPION MILL PLANT

TEST OF BOILER PLANT BOILERS LOCATED AT FREDA-MICHIGAN  
TO DETERMINE COMBINED EFFICIENCY OF BOILER-FURNACE AND GRATE

DATE		MARCH 23-24-1916		CAPACITY	
DURATION		24 HOURS			
KIND OF DRAFT		INDUCED		BOILER HORSE POWER DEVELOPED 1820	
STIRLING BOILERS HAVE ANDREWS GRATES				RATED CAPACITY IN EVAPORATION FROM AND AT 212°	
200 H.P. MARINES - HAWLEY DOWN DRAFT FURNACE				BUILDERS RATING IN BOILER HORSE POWER 1450	
150 H.P. " - HERRING BONE GRATES.				PERCENT OF RATED CAPACITY DEVELOPED 125	
KIND OF FURNACE				ECONOMY RESULTS	
GRATE SURFACE TOTAL					
PERCENT AIR OPENING IN GRATE					
WATER HEATING SURFACE - TOTAL		12818			
SUPERHEATING SURFACE		NONE		WATER FED PER POUND OF COAL FIRED 7.77	
RATIO OF GRATE TO WATER HEATING SURFACE				WATER EVAPORATED INTO DRY STEAM PER POUND OF DRY COAL 8.00	
KIND AND SIZE OF COAL PITTSBURGH.				EQUIVALENT EVAPORATION - DRY STEAM - FROM AND AT 212° PER POUND OF DRY COAL 8.42	
				EQUIVALENT EVAPORATION - DRY STEAM - FROM AND AT 212° PER POUND OF COMBUSTIBLE 9.10	
AVERAGE PRESSURES				EFFICIENCY	
STEAM PRESSURE BY GAUGE		162.2		CALORIFIC VALUE OF ONE POUND OF DRY COAL 14182	
BAROMETER 28.83 INCHES OF Hg. 4900		14.1		CALORIFIC VALUE OF ONE POUND OF COMBUSTIBLE 15140	
DRAFT AT BOILER DAMPER				EFFICIENCY OF BOILER-FURNACE AND GRATE 57.6	
DRAFT OVER FIRE				EFFICIENCY OF BOILER AND FURNACE 58.3	
AIR PRESSURE UNDER FIRE				PROXIMATE ANALYSIS OF COAL	
DRAFT AT ENTRANCE TO ECONOMIZER					
DRAFT AT BASE OF STACK		1.09			
AVERAGE TEMPERATURES					
EXTERNAL AIR		26.5		MOISTURE	
BOILER ROOM		64.7		FIXED CARBON	
STEAM				VOLATILE MATTER	
FEED WATER ENTERING ECONOMIZER		142.4		ASH	
FEED WATER ENTERING BOILER		216.1		5.20	
FLUE GASES LEAVING BOILER - AVERAGE		700.0		SULPHUR - DETERMINED SEPARATELY	
FLUE GASES AT BASE OF STACK ?		419.0		COMBUSTIBLE IN ASH	
TOTAL QUANTITIES					
WEIGHT OF COAL AS FIRED		188514		PERCENT COMBUSTIBLE IN ASH 26.90	
PERCENT MOISTURE IN COAL		5.2		TOTAL WEIGHT OF COMBUSTIBLE IN ASH 3590	
TOTAL WEIGHT OF DRY COAL		178712		FLUE GAS ANALYSIS	
TOTAL WEIGHT OF ASH AND REFUSE		13342			
TOTAL COMBUSTIBLE CONSUMED		165370			
PERCENT ASH AND REFUSE IN DRY COAL		7.46			
TOTAL WEIGHT OF WATER FED TO BOILER		1465661		CO <sub>2</sub>	
TOTAL WEIGHT OF WATER CORRECTED FOR MOISTURE IN STEAM		1442943		0	
FACTOR OF EVAPORATION		1.0427		CO	
TOTAL EVAPORATION FROM AND AT 212°		1504556		HYDROGEN AND HYDROCARBONS	
HOURLY QUANTITIES				REMARKS	
DRY COAL CONSUMED PER HOUR		7440			
DRY COAL CONSUMED PER SQUARE FOOT OF GRATE SURFACE PER HOUR					
WATER EVAPORATED PER HOUR		60122			
EQUIVALENT EVAPORATION PER HOUR FROM AND AT 212°		62689		CO <sub>2</sub> ENTRANCE TO NO. 1 ECONOMIZER - 7.5%	
				LBS. ROCK STAMPED PER LB. COAL FIRED - 35.9	
				STAMPING RATE PER 24 HRS. PER HEAD - 601 TONS	
				6 HEADS OPERATED FOR TOTAL OF 135 HR. - 1 MIN.	
				2.01% DRY COAL = COMBUSTIBLE IN ASH.	
				PLANT EVAPORATION - 9.86	
				42° FEED WATER.	
				ENGINEER IN CHARGE OF TEST	