



Hunter Plan Heat Rate Improvement Plan

Htr_2009_HRIP

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1. Revision History

Version	Status	Author	Reason for Issue	Date
1			2009 Plan Issue	March 31, 2009

2. Revision Control

This document is maintained by the PacifiCorp Energy Asset Management group.

3. Glossary of Terms

3.1. Actual Net Heat Rate (Btu/kWh)

Total actual heat input in Btu’s divided by actual net generation.

3.2. As-built Net Heat Rate (Btu/kWh)

Total guaranteed heat input, from the design heat balances in Btu’s divided by the guaranteed net generation, corrected for changes in equipment from design. This is the baseline number for the plant personnel when they make their annual reconciliation.

3.3. British thermal unit (Btu)

British thermal unit is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

3.4. Gross Heat Rate (Btu/kWh)

Total actual heat input in Btu’s divided by actual gross generation.

3.5. Net Generation (kWh)

Gross generation minus auxiliary or station usage

3.6. Planned Net Heat Rate (Btu/kWh)

Total budgeted heat input in Btu’s divided by the budgeted net generation. This number is the annual goal for the plant personnel to achieve.

4. Overall Plan and Objectives

4.1. Unit 1- Goals for 10-year plan

Figure 1, in the appendix, shows the ten-year heat rate plan for Hunter unit 1. The dips in the Planned Net Heat Rate in the years 2011 and 2015 are due to the work that is scheduled to take place during the planned outages in 2010 and 2014 (see section 7).

4.2. Unit 2 - Goals for 10-year Plan

Figure 2, in the appendix, shows the ten-year heat rate plan for Hunter unit 1. The dips in the Planned Net Heat Rate in the years 2012 and 2016 are

due to the work that is scheduled to take place during the planned outages in 2011 and 2015 (see section 7).

4.3. Unit 3 - Goals for 10-year Plan

Figure 3, in the appendix, shows the ten-year heat rate plan for Hunter unit 1. The dips in the Planned Net Heat Rate in the years 2012 and 2016 are due to the work that is scheduled to take place during the planned outages in 2011 and 2015 (see section 7).

5. Performance against last year's plan

5.1. Unit 1

Planned Net Heat Rate				10,758
Reconciliation to Planned Net Heat Rate	Planned	Actual		
Boiler Losses	258	95	(162)	
Turbine Losses	577	982	404	
Other Losses	77	119	42	
Actual Net Heat Rate				11,042

Negative numbers in the table above are improvements to heat rate.

5.2. Unit 2

Planned Net Heat Rate				10,558
Reconciliation to Planned Net Heat Rate	Planned	Actual		
Boiler Losses	231	11	(220)	
Turbine Losses	407	897	490	
Other Losses	81	71	(11)	
Actual Net Heat Rate				10,817

Negative numbers in the table above are improvements to heat rate.

5.3. Unit 3

Planned Net Heat Rate				10,098
Reconciliation to Planned Net Heat Rate	Planned	Actual		
Boiler Losses	172	11	(161)	
Turbine Losses	392	897	505	
Other Losses	(37)	(205)	(168)	
Actual Net Heat Rate				10,275

Negative numbers in the table above are improvements to heat rate.

6. Major Losses for Current Planned Net Heat Rate

This section of the heat rate plan identifies the reconciliation of the items that have the most impact between the As-built Net Heat Rate and the Planned Net Heat Rate.

6.1. Unit 1

As-Built Net Heat Rate	9,846
Boiler Losses	284
Turbine Losses	588
Other Losses	23
<u>Planned Net Heat Rate</u>	<u>10,741</u>

6.2. Unit 2

As-Built Net Heat Rate	9,839
Boiler Losses	258
Turbine Losses	502
Other Losses	-5
<u>Planned Net Heat Rate</u>	<u>10,593</u>

6.3. Unit 3

As-Built Net Heat Rate	9,572
Boiler Losses	258
Turbine Losses	502
Other Losses	-131
<u>Planned Net Heat Rate</u>	<u>10,201</u>

7. Major Unit Specific Initiatives

This section identifies the major planned capital and operational activities to improve or regain lost heat rate for the current 10-year plan.

7.1. Unit 1

Table 1 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

7.2. Unit 2

Table 2 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

7.3. Unit 3

Table 3 shows the capital projects included in the 10-year plan that contribute to the recovery of lost heat rate. Numbers inside parentheses are negative impact on heat rate and represent improvement to the overall unit efficiency.

8. Annual Review and Update

This plan will be reviewed and updated annually by the Hunter plant management team by March 31.

9. Appendix

Figure 1
Hunter Unit 1
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,846	9,846	9,846	9,846	9,846	9,846	9,845	9,844	9,844	9,844	9,845	9,846	9,846	9,846	9,846	9,846
Planned Net Heat Rate - Btu/kWh	10,441	10,675	10,720	10,675	10,758	10,741	10,165	10,045	10,156	10,248	10,230	10,273	10,326	10,342	10,135	10,108
Actual Net Heat Rate - Btu/kWh	10,680	10,577	10,697	10,656	11,042											
Capacity Factor	84%	82%	91%	86%	88%	85%	76%	86%	85%	83%	72%	87%	87%	86%	79%	86%
Annual Deviation from Plan - %	2.29%	-0.92%	-0.21%	-0.17%	2.64%											
Four-year Average Deviation from Plan - %	2.29%	0.68%	0.58%	0.25%	0.33%											

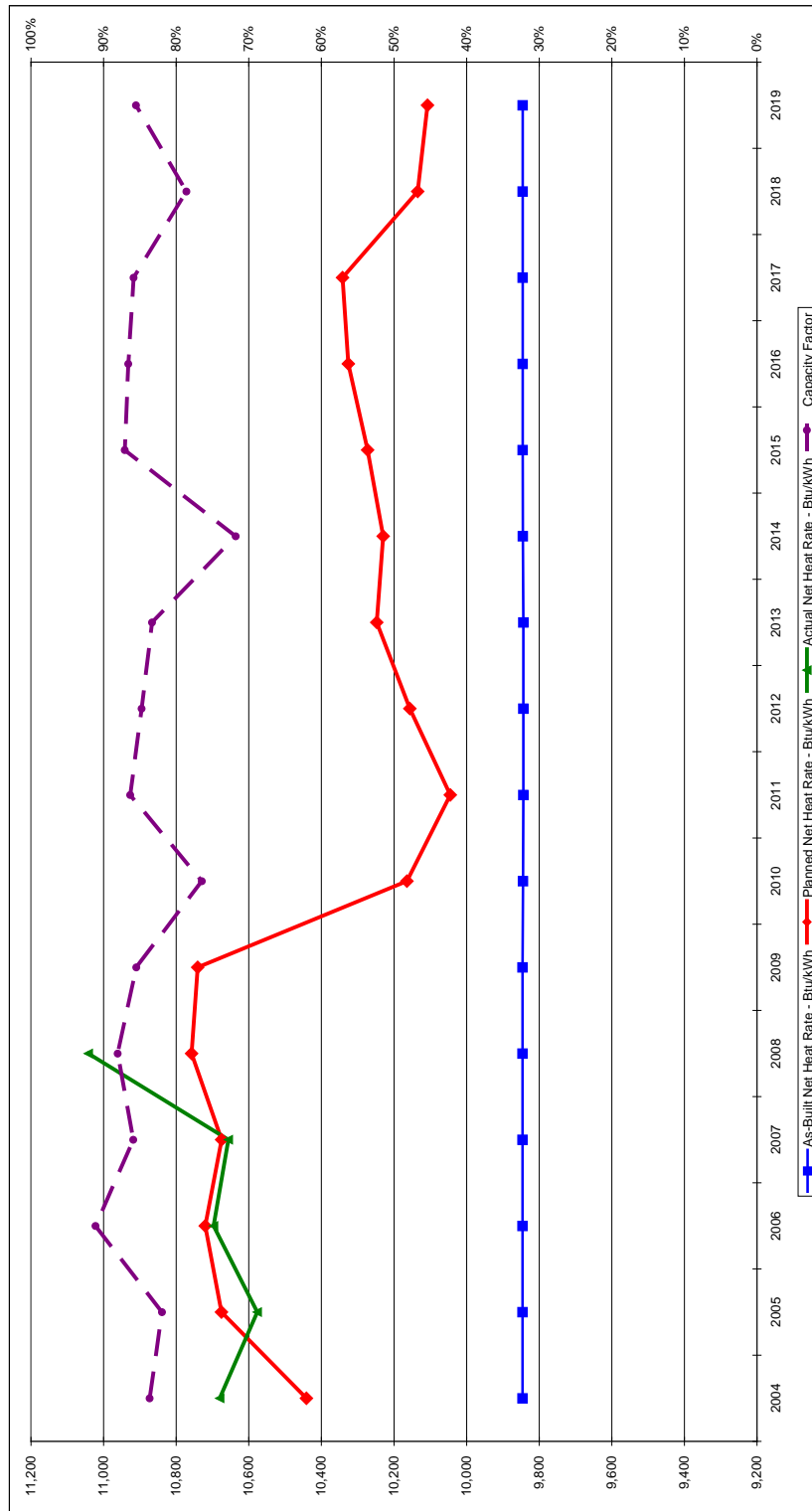


Figure 2
Hunter Unit 2
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,839	9,839	9,839	9,839	9,839	9,839	9,839	9,839	9,840	9,840	9,840	9,840	9,840	9,840	9,840	9,842
Planned Net Heat Rate - Btu/kWh	10,425	10,618	10,570	10,463	10,558	10,593	10,653	10,098	10,037	10,153	10,243	10,206	10,266	10,291	10,307	10,131
Actual Net Heat Rate - Btu/kWh	10,801	10,867	10,636	10,429	10,817											
Capacity Factor	87%	87%	80%	89%	90%	89%	86%	75%	90%	89%	88%	84%	90%	89%	88%	69%
Annual Deviation from Plan - %	3.61%	2.34%	0.63%	-0.32%	2.46%											
Four-year Average Deviation from Plan - %	3.61%	2.97%	2.19%	1.56%	1.28%											

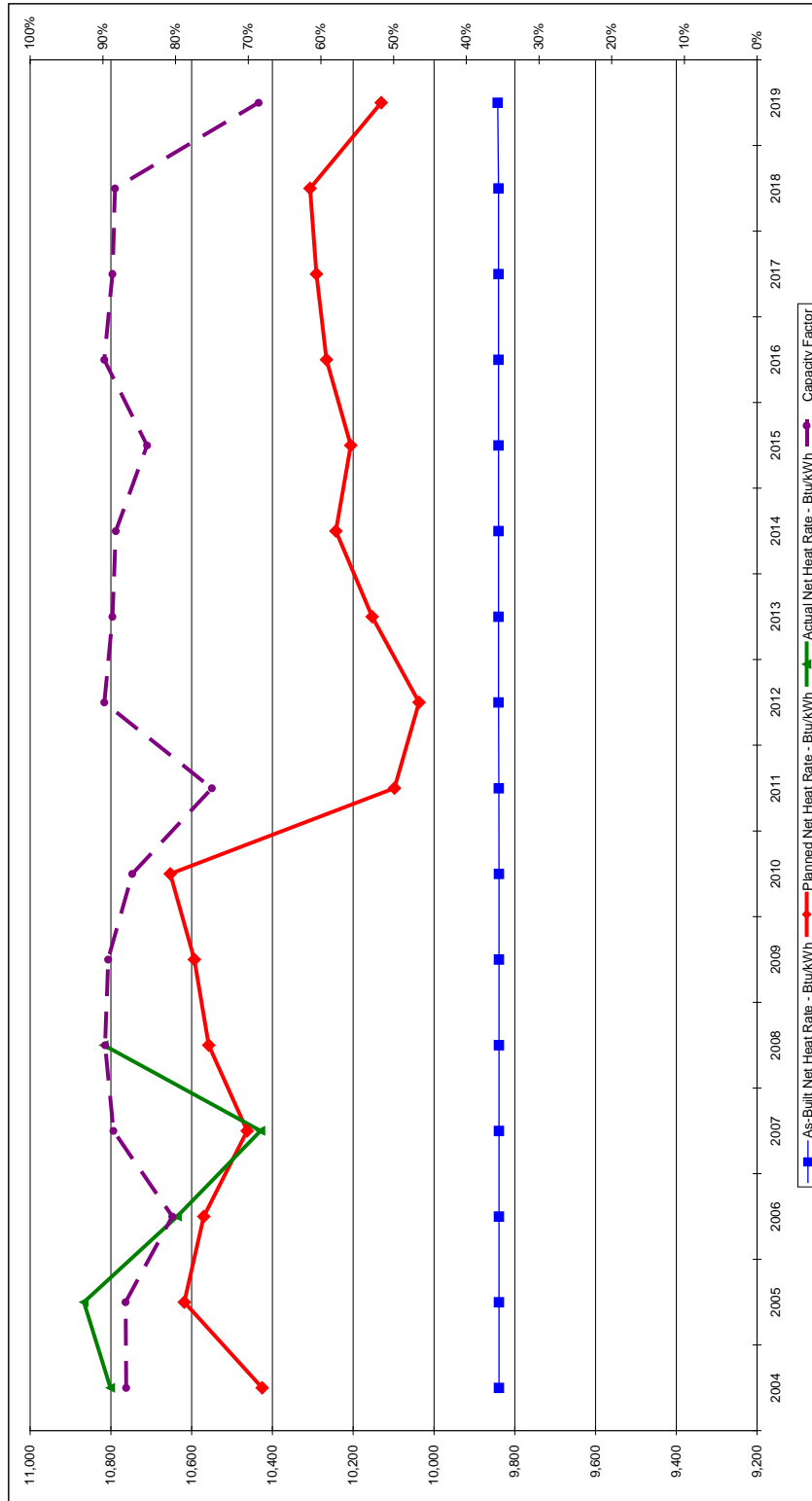
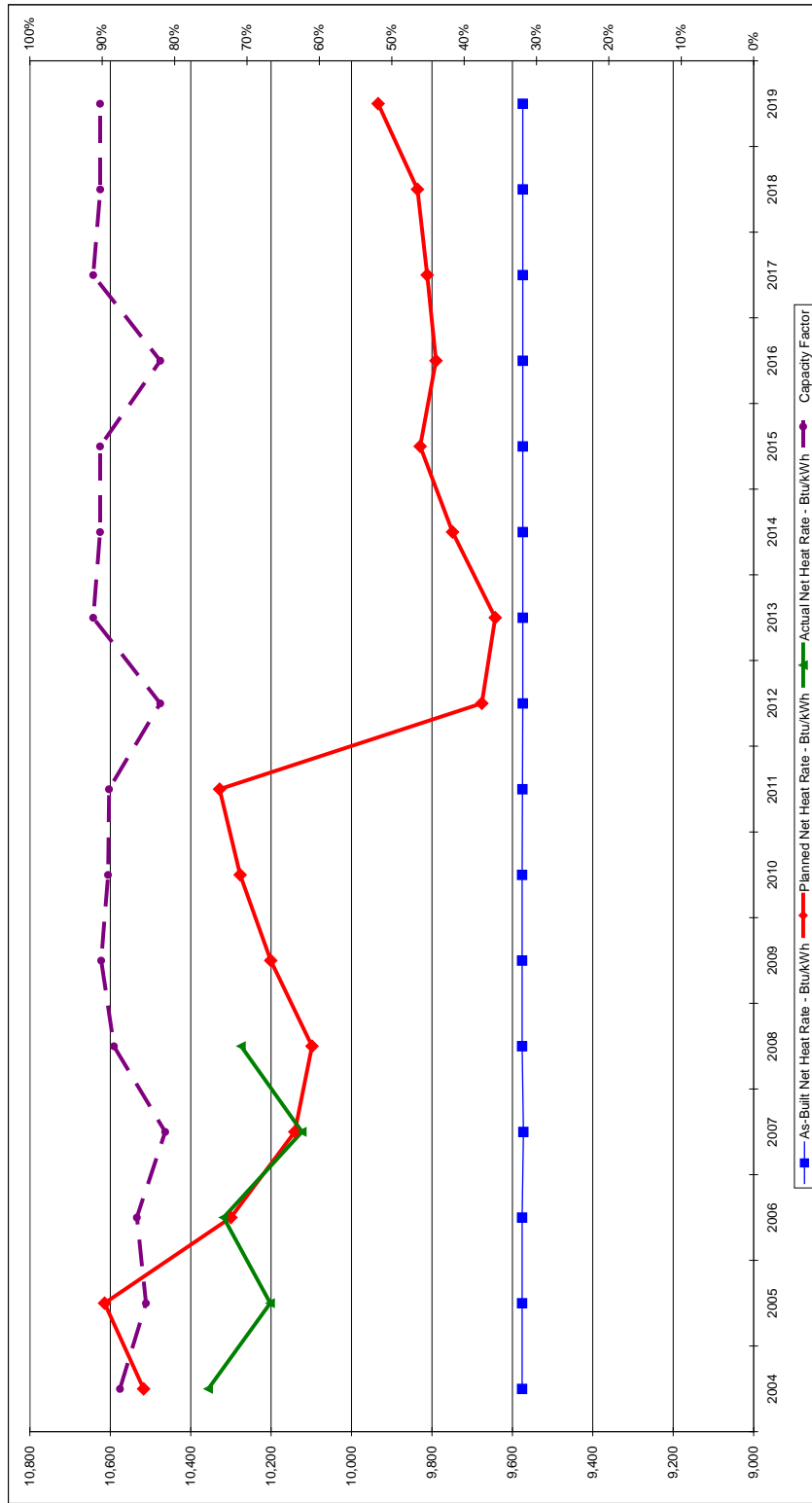


Figure 3
Hunter Unit 3
10-year Plan Heat Rate Goals

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
As-Built Net Heat Rate - Btu/kWh	9,576	9,576	9,576	9,572	9,576	9,576	9,576	9,575	9,574	9,574	9,574	9,574	9,574	9,574	9,574	9,574
Planned Net Heat Rate - Btu/kWh	10,517	10,614	10,300	10,141	10,098	10,201	10,277	10,328	9,676	9,642	9,749	9,829	9,790	9,812	9,836	9,934
Actual Net Heat Rate - Btu/kWh	10,356	10,202	10,318	10,123	10,275											
Capacity Factor	88%	84%	85%	81%	88%	90%	89%	89%	82%	91%	90%	90%	82%	91%	90%	90%
Annual Deviation from Plan - %	-1.53%	-3.88%	0.18%	-0.17%	1.75%											
Four-year Average Deviation from Plan - %	-1.53%	-2.71%	-1.74%	-1.35%	-0.53%											



**Table 1
Hunter Unit 1
10-year Plan Heat Rate Improvement Projects**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Plant controls replacement/Optimization systems in place											
CO / LOI combustion optimization system		-6	-10	-10	-10	-10	-10	-10	-10	-10	-10
Feedwater Heater Replacement--HP FWH's		-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Air Preheater basket and seal replacement		-9	-16	-16	-16	-16	-16	-16	-16	-16	-16
HP/IP Turbine Upgrade (17MW, 16.1 Pcorp share) (2010)		-5	-8	-8	-8	-8	-8	-8	-8	-8	-8
Clean air initiative: Baghouse installation, wet stack		-218	-374	-374	-374	-374	-374	-374	-374	-374	-374
Total adjustments related to Capital Projects		-240	-410	-410	-410	-389	-378	-378	-378	-378	-378
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Planned Heat Rate		0	-64	-106	-106	-106	-43	-12	-12	-12	-12
Total Auxiliary Load Changes		0	-64	-106	-106	-106	-43	-12	-12	-12	-12
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Clean air initiative: Baghouse installation, wet stack		0	0	0	0	0	-1	-1	-1	-1	-1
HP/IP Turbine Upgrade (17MW, 16.1 Pcorp share) (2010)		11	17	17	17	17	17	17	17	17	17
Total Capacity Changes		0	11	17	17	17	16	16	16	16	16

**Table 2
Hunter Unit 2
10-year Plan Heat Rate Improvement Projects**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Plant controls replacement/Optimization system in place			-10	-10	-10	-10	-10	-10	-10	-10	-10
Air Preheater Basket Replacement			-8	-8	-8	-8	-8	-8	-8	-8	-8
Turbine Upgrade DensePack (17mMW, 100%)			-249	-374	-374	-374	-374	-374	-374	-374	-374
Clean air initiative - Baghouse installation, wet stack			23	34	34	34	34	33.8	33.8	33.8	33.8
Clean air initiative - SCR (2019 +2.2MW)											38
Total adjustments related to Capital Projects	0	0	-245	-358	-358	-358	-358	-358	-358	-358	-320
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Planned Heat Rat			12	43	43	43	43	43	43	43	148
Total Auxiliary Load Changes	0	0	12	43	43	43	43	43	43	43	148
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Clean air initiative: Baghouse, wet stack (2011)		0	-1	-1	-1	-1	-1	-1	-1	-1	-1
Turbine Upgrade DensePack (17mMW, 100%) (2011)			11	17	17	17	17	17	17	17	17
Clean air initiative - SCR (2019 +2.2MW)											-1
Total Capacity Changes	0	0	10	16	16	16	16	16	16	16	14

**Table 3
Hunter Unit 3
10-year Plan Heat Rate Improvement Projects**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Budgeted / Planned Heat Rate Changes, Net basis (Improvements are negative)											
Cooling tower replacement (backpressure related)				-20	-20	-20	-20	-20	-20	-20	-20
Feedwater Htr replacement - HP			-10	-10	-10	-10	-10	-10	-10	-10	-10
Turbine Upgrade DensePack (19mMW)				-284	-378	-378	-378	-378	-378	-378	-378
Total adjustments related to Capital Projects	0	0	-10	-314	-408	-408	-408	-408	-408	-408	-408
Budgeted / Planned Auxiliary Load Changes											
Reduced auxiliary load benefit of Budgeted / Planned Heat Rat	KW	0	-29	-86	-86	-86	-86	-86	-86	-86	-86
Total Auxiliary Load Changes	KW	0	-29	-86	-86	-86	-86	-86	-86	-86	-86
Budgeted / Planned Net Dependable Rating Changes, (Net Basis)											
Turbine Upgrade DensePack (19mMW)	MW			14	19	19	19	19	19	19	19
Total Capacity Changes	MW	0	0	14	19	19	19	19	19	19	19

10. Required Signatures

Performance Engineer – Hunter Plant		Kent Gilbert	
Signature:	(on file)	Date:	27Mar09

Manager, Engineering – Hunter Plant		Larry Bruno	
Signature:	(on file)	Date:	27Mar09

Managing Director – Hunter Plant		Lauren Huntsman	
Signature:	(on file)	Date:	30Mar09