



## ClearSign ULNOx Experience List – Process Burners

No.	Client	Project	Location	Equipment Type	Description	Startup Date	NOx (Act / Gty) PPM
1	Confidential Client #1	H-503	Bakersfield, CA	VC Heater – Monolithic Wall	3 Burners, 11 MM BTU/HR total, Up fired, Natural Draft, RFG	Apr 2016	4.5 / 6.0
2	Tricor Refining, LLC	H-21	Bakersfield, CA	VC Heater – Monolithic Wall	1 Burner, 12 MM BTU/Hr, Up Fired, Natural Draft, Nat Gas	Oct 2016	5.6 / 6.0
3	Delek Refining, LLC	15-H-2	Tyler, TX	Cabin Heater – Process Burner	FCC Feed Preheater, 1 Burner, 2.7 MM BTU/Hr, Up Fired, Natural Draft, RFG	Oct 2017	N/A – no NOx GTY
4	Tricor Refining, LLC	H-21	Bakersfield, CA	VC Heater – Process Burner	Tank Heater, 1 Burner, 8 MM BTU/hr, Up Fired, Natural Draft, Nat Gas	May 2018	4.0-5.5 / 6.0
5	Tricor Refining, LLC	H-21	Bakersfield, CA	VC Heater – Process Burner	Tank Heater, 1 Burner, 15 MM BTU/hr, Up Fired, Natural Draft, Nat Gas	June 2019	5.5 / 6.0
6	World Oil	H-101 Crude Heater	South Gate California	VC Heater – Process Burner	5 Burner, 39 MM BTU/hr total, Up Fired, Natural Draft, Nat Gas	In progress	In progress / 9.0
7	ExxonMobil	H-601	Broken Arrow, OK	Test Furnace – Process Burner	High H2 technology validation project, 4 burner, ~41 MM BTU/hr total, Up Fired, Natural Draft, RFG	September 2021	9.0
8	Confidential Client #5	H-101	Greater Los Angeles, CA	VC Heater – Process Burner	Reboiler, 3 Burner, 12.5 MM BTU/Hr total, Up Fired, Natural Draft, Nat Gas + offgas	March 2021	6.4 / 7.0
9	Confidential Client #6	H-572	United Kingdom	VC Heater – Process Burner	Single burner, 2.25 MM BTU/hr, Up Fired, Natural Gas, refinery fuel gas	Jan 2022	12 / 15 (optimized for CO and UHC, cold furnace)



## ClearSign ULNOx Experience List – Process Burners

No.	Client	Project	Location	Equipment Type	Description	Startup Date	NOx (Act / Gty) PPM
10	Confidential Client #8	B-307/308 Crude Heaters	Midwestern USA	VC Heater – Process Burner	Two identical heaters each with 8 x 18MMBTU/hr burners, Up Fired, Natural Draft, Refinery fuel gas	On Hold	n/a / 9.0
11	Confidential Client #9	3F3 / 3F4 HCR Reboiler Heaters	Los Angeles, CA	VC Heaters – Process Burner	Two heaters: one 8 x 8.5MMBTU/hr, second 10 x 12 MM BTU/hr burners, Up Fired, Natural Draft, Refinery fuel gas	2Q23	In progress / 5.0