CH2MHILL

DOCKET
07-SPPE-1
DATE SEP 25 2007
RECD. SEP 26 2007

CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA
Tel 916-920-0300
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September 25, 2007

351572

Mary Dyas
Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814-5512

Subject: Data Response, Set 1B
Chevron Power Plant Replacement Project (07-SPPE-1)

Dear Ms. Dyas:

On behalf of Chevron, please find attached 12 copies and one original of the Data Responses, Set 1B, in response to Staff's Data Requests dated August 8, 2007 that were not responded to previously. We are also filing copies of this Data Response electronically.

Please call me if you have any questions.

Sincerely,

CH2M HILL

David A. Stein, PE
Project Manager

c: Project File
Proof of Service List

CHEVRON POWER PLANT REPLACEMENT PROJECT (07-SPPE-01)

DATA RESPONSE, SET 1B

Submitted by

Chevron

September 25, 2007

CH2MHILL

2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

Chevron Richmond Power Plant Replacement Project
07-SPPE-1
DATA REQUEST RESPONSE SET 1B

Technical Area: Air Quality
Authors: Brewster Birdsall

BACKGROUND

Net Emission Increases

The application shows conflicting emissions totals. According to Table 8.1-19, the CTG, HRSG, and cooling tower would emit 47.3 tons per year (tpy) PM10. However, Table 8.1-27 shows that the Power Plant Replacement would cause 14.8 tpy PM10, and text following that table states that the proposal would offset an 11 tpy PM10 increase. Table 8.1-27 (Section 8.1.8.2) does not provide sufficient detail to determine which sources create the reductions or what quantity of emission reduction credits (ERCs) would be surrendered.

DATA REQUEST

12. Please itemize the existing emission sources within the refinery that would be shutdown as a result of the Hydrogen Plant Replacement and Power Plant Replacement and quantify the baseline annual emissions.

    Response: Please see the previous response submitted in Data Request Response Set 1A indicating that the existing boilers in the Number 1 power plant will be shutdown once Cogen 3000 becomes fully operational and itemizing the BAAQMD ERCs held by Chevron. The additional information provided below and in Attachment AQ-12A quantifies the baseline annual emissions.

    Attachment AQ-12A presents the emission inventory recently agreed to by the Bay Area Air Quality Management District. The emission inventory includes equipment capacities, emission estimates for new equipment, baseline emission estimates, and net emissions increases and decreases. Attachment AQ-12B presents the toxic emission estimates for the Renewal project.

13. Please show the proposed project's annual emission increases (including startups/shutdowns) for comparison with the baseline annual emissions.

    Response: The BAAQMD approved emission inventory for the entire Renewal project is presented in Attachments AQ-12A and AQ-12B.

14. Please identify the quantities of ERCs for each criteria pollutant that would be surrendered as part of the proposed project. The list of potential ERCs for surrender (Table 8.1-28) should be updated because some of the certificate numbers are no longer applicable.

    Response: Table AQ-14 presents a summary of the net emissions increases/decreases (based on the BAAQMD approved emission inventory). This table shows a slight increase of 7.31 tons per year of VOC emissions and an increase of 77.32 tons per year of CO emissions. As the BAAQMD is in attainment of the state and federal CO ambient air

quality standards, no ERCs are required. Therefore, the Renewal project will only be required to provide 8.4 tons per year of VOC ERCs.

TABLE AQ-14 CHEVRON RENEWAL PROJECT NET EMISSION INCREASES/DECREASES

	Net Emissions (tons/year)				
	NOx	SOx	CO	PM	VOC
Hydrogen Plant Replacement	-7.33	-51.81	49.59	-19.33	-0.57
Power Plant Replacement	-13.52	1.67	30.22	14.14	1.02
Reformer Replacement	-52.04	1.75	15.75	1.05	0.66
Hydrogen Purity Improvements	5.42	25.97	-18.25	-2.46	6.20
Renewal Project Total	-67.47	-22.43	77.32	-6.60	7.31
Emission Offset Factor	NA	NA	NA	NA	1.15
Amount to be Offset	NA	NA	NA	NA	8.4

15. Please describe the plan for shutting down existing sources as part of the Hydrogen Plant or the Power Plant Replacement Projects and how the proposed reductions would be made enforceable, real, and permanent.

Response: As described in the response to Data Request 12, the existing boilers in the No. 1 power plant will be shutdown once Cogen 3000 becomes fully operational. Please see the response to Data Request #12.

ATTACHMENT AQ-12A

Attachment AQ-12A

Chevron Refinery Renewal Project Emission Inventory Sources	Maximum Annual Avg Capacity	Post-Project Status
A. List of BAAQMMD Sources (not including abatement devices and emission points)		
1. Hydrogen Plant Replacement		
a) Existing H2 Plant (both trains): S-4250	150 MMSCFD	S/D
b) Existing 20 Plant PSA/HRU: S-4348	20 MMSCFD	S/D
c) New Hydrogen Plant (2 Trains): S-4449, S-4450	280 MMSCFD	New
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	847 MMBtu/hr	S/D
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	847 MMBtu/hr	S/D
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	130 MMBtu/hr total	S/D
d) H2 Plant Train 1 Reformer Furnace: S-4471	920 MM Btu/hr	New
e) H2 Plant Train 2 Reformer Furnace: S-4472	920 MM Btu/hr	New
f) H2 Recovery Unit (new front-end PSA): S-4451	50 MMSCFD	New
g) New Cooling Tower: S-4465	51.84 MMGPD	New
h) New Flare: S-6020	0.2 MMBtu/hr pilot	New
j) Existing TKN Furnaces F-510/20/30 (low NOx burners): S-4161, S-4162, S-4163	61 MMBtu/hr each	Altered
k) Existing Poly Plant Furnaces F-651, F-661 (low NOx burners): S-4188, S-4189	27 and 15 MMBtu/hr, resp.	Altered
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	61 MMBtu/hr each	Altered
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	27 and 15 MMBtu/hr, resp.	Altered
2. Power Plant Replacement (Include Repower Existing)		
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	~250 MMBtu/hr each	S/D
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	53.5 MW; 860 MMBtu/hr per train (turbine and duct)	Modified
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	53.5 MW; 860 MMBtu/hr per train (turbine and duct)	Modified
e) New 3rd Cogen Unit/HRSG :S-4473, S-4474	49.5 MW; 840 MMBtu/hr per train (turbine and duct)	New
f) Cogen Cooling Tower (S-4325)	0 MMGPD	Eliminated
3. Reformer Replacement		
a) Existing #4 Rheniformer: S-4283	40 MBbl/day	S/D
b) Existing #5 Rheniformer: S-4237	31 MBbl/day	S/D
c) New Continuous Catalytic Reformer: S-4452	75 MBbl/day	New
a) Existing #4 Rhen Furnaces F-3550/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	187, 170, 152, 77 MMBtu/hr resp.	S/D
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	198, 133, 78, 52 MMBtu/hr resp.	S/D
c) New CCR Furnaces S-4477, S- 4478, S- 4479, S-4480	500 MMBTU/hr	New
4. Hydrogen Purity Project (Incl. TKC Debottleneck)		
a) Existing TKC: S-4253	80 MBbl/day	Modified
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	61 MBbl/day	Altered
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	47, 45, 145 MMBtu/hr resp.	Unchanged
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	47, 45, 145 MMBtu/hr resp.	Unchanged
d) New TKC Recycle H2 Amine Contactor: S-4453	6 MMSCFD H2S	New
e) New Fresh Amine Tank: S-4481	70k gal	New
e) New Lean Amine Tank S-3227	130k gal	New
e) New Caustic Tank S-3228	200k gal	New
e) New Spent Caustic Tank S-3229	400k gal	New
f) Existing #4 H2S: S-4434	5 MMSCFD H2S	Unchanged
g) Existing #5 H2S: S-4435	8.57 MMSCFD H2S	Modified
h) Existing SRUs: S-4227, S-4228, S-4229	200, 200, 450 LTPD, resp.	Modified
i) Existing SRU Stack Gas Heaters: S-4192, S-4193, S-4194,	32, 32, 56 MMBtu/hr resp.	Modified
j) Existing Sulfur Loading Rack: S-4396	216 kLTPY	S/D
k) New SRU Amine Regenerator: S-4454	9.2 MMSCFD H2S	New
n) New Acid Gas Scrubber: S-4450	9.0 MMSCFD H2S	New
o) New Sulfur Loading Rack: S-4490	310 kLTPY	New

Attachment AQ-12A
Chevron Refinery Renewal Project
Emission Increases/Decreases

Emissions increases and Decreases (excluding TKN and Poly furnaces)

Table X.a

Projects	Net Emissions (lbs/day)					
	NOx	SOx	CO	PM	VOC	Toxics
Hydrogen Plant Replacement	-40	-284	272	-106	-3	
Power Plant Replacement	-74	9	168	77	6	
Reformer Replacement	-285	10	86	6	4	
Hydrogen Purity Improvements	30	142	-100	-13	34	
Renewal Project Total	-370	-123	424	-36	40	0

Table X.a

Projects	Emissions Increases (lbs/day)					
	NOx	SOx	CO	PM	VOC	Toxics
Hydrogen Plant Replacement *	355	277	501	126	192	
Power Plant Replacement	186	9	181	151	60	
Reformer Replacement	83	10	130	90	97	
Hydrogen Purity Improvements	224	458	1172	34	37	
Renewal Project Total	848	754	1984	401	386	0

Table X.a

Projects	Emissions Decreases (lbs/day)					
	NOx	SOx	CO	PM	VOC	Toxics
Hydrogen Plant Replacement	396	561	230	232	195	
Power Plant Replacement	260	0	15	73	54	
Reformer Replacement	368	0	44	84	93	
Hydrogen Purity Improvements	194	316	1272	48	3	
Renewal Project Total	1218	877	1561	437	346	0

Table X.b

	Net Emissions (tons/year)					
	NOx	SOx	CO	PM	VOC	Toxics
Hydrogen Plant Replacement	-7.33	-51.81	49.59	-19.33	-0.57	
Power Plant Replacement	-13.52	1.67	30.22	14.14	1.02	
Reformer Replacement	-52.04	1.75	15.75	1.05	0.66	
Hydrogen Purity Improvements	5.42	25.97	-18.25	-2.46	6.20	
Renewal Project Total	-67.47	-22.43	77.32	-6.60	7.31	0.00
Emission Offset Factor						
Amount to be Offset						

Table X.b

	Emissions Increases (tons/year)					
	NOx	SOx	CO	PM	VOC	Toxics
Hydrogen Plant Replacement	64.88	50.57	91.51	22.95	35.11	
Power Plant Replacement	33.91	1.67	33.02	27.50	10.89	
Reformer Replacement	15.11	1.80	23.70	16.46	17.67	
Hydrogen Purity Improvements	40.85	83.61	213.89	6.24	6.73	
Renewal Project Total	154.74	137.65	362.12	73.14	70.41	0.00
Emission Offset Factor						
Amount to be Offset						

Table X.b

	Emissions Decreases (tons/year)					
	NOx	SOx	CO	PM	VOC	Toxics
Hydrogen Plant Replacement	72.20	102.39	41.92	42.27	35.67	
Power Plant Replacement	47.43	0.00	2.80	13.36	9.87	
Reformer Replacement	67.14	0.05	7.95	15.41	17.02	
Hydrogen Purity Improvements	35.43	57.64	232.13	8.70	0.53	
Renewal Project Total	222.21	160.08	284.80	79.74	63.09	0.00
Emission Offset Factor						
Amount to be Offset						

Sources	Net Emissions (tons/year)					
	NOx	SOx	CO	PM	VOC	Toxics
1. Hydrogen Plant Replacement						
a) Existing H2 Plant: S-4250	0.00	0.00	-10.22	0.00	-9.69	
b) Existing 20 Plant PSA/HRU: S-4348	0.00	0.00	0.00	0.00	0.00	
c) New Hydrogen Plant (2 Trains): S-NEW	0.00	0.00	0.00	0.00	6.50	
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	-31.63	0.00	-20.26	-25.90	-13.30	
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	-37.22	0.00	-10.00	-15.36	-11.90	
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	-3.35	0.00	-1.44	-1.01	-0.79	
d) H2 Plant Train 1 Reformer Furnace: S-NEW	26.63	0.72	32.05	10.34	11.60	
e) H2 Plant Train 2 Reformer Furnace: S-NEW	26.63	0.72	32.05	10.34	11.60	
a) New H2 Plant Feed Furnaces: S-NEW...	0.00	0.00	0.00	0.00	0.00	
f) H2 Recovery Unit (new front-end PSA): S-NEW	0.00	0.00	0.00	0.00	0.00	
g) New Cooling Tower: S-NEW	0.00	0.00	0.00	1.97	0.00	
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	0.00	0.00	0.00	0.00	0.00	
h) New Flare: S-NEW	11.61	0.04	27.40	0.30	5.41	
i) New Startup Incinerator???: S-NEW	0.00	0.00	0.00	0.00	0.00	
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
l) Existing Fuel Gas System SO2	0.00	-102.39	0.00	0.00	0.00	
m) New Fuel Gas System SO2	0.00	49.09	0.00	0.00	0.00	
Net Hydrogen Plant Replacemen	-7.33	-51.81	49.59	-19.33	-0.57	0.00
2. Power Plant Replacement (Include Repower Existing)	NOx	SOx	CO	PM	VOC	Toxics
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4138	-47.43	0.00	-2.80	-13.36	-9.87	
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
d) New H2 Plant Cogen Unit: S-NEW	0.00	0.00	0.00	0.00	0.00	
e) New 3rd Cogen Unit (option): S-NEW	33.91	1.67	33.02	27.41	10.89	
f) Cogen Cooling Tower (S-NEW)	0.00	0.00	0.00	0.09	0.00	
Net Power Plant Replacement (Include Repower Existing)	-13.52	1.67	30.22	14.14	1.02	0.00
3. Reformer Replacement	NOx	SOx	CO	PM	VOC	Toxics
a) Existing #4 Rheniformer: S-4283	-0.02	-0.03	-1.17	0.00	-2.70	
b) Existing #5 Rheniformer: S-4237	-0.02	-0.03	-1.25	0.00	-2.38	
c) New Continuous Catalytic Reformer: S-NEW	1.80	1.80	7.50	0.14	5.87	
a) Existing #4 Rhen Furnaces F-3850/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	-34.86	0.00	-2.06	-8.43	-6.53	
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	-32.25	0.00	-3.47	-6.97	-5.40	
c) New CCR Furnaces S-NEW, S-NEW, S- NEW, S-NEW (S-NEW?)	13.31	0.00	16.20	16.32	11.81	
Net Reformer Replacement	-52.04	1.75	15.75	1.05	0.66	0.00
4. Hydrogen Purity Project (Incl. TKO Debottlenecks)	NOx	SOx	CO	PM	VOC	Toxics
a) Existing TKC: S-4253	0.00	0.00	0.00	0.00	0.00	
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	0.00	0.00	0.00	0.00	0.00	
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
d) New TKC Recycle H2 Amine Contactor: S-NEW	0.00	0.00	0.00	0.00	3.89	
e) NEW Amine Tank: S-NEW	0.00	0.00	0.00	0.00	0.00	
f) Existing #4 H2S: S-4434	0.00	0.00	0.00	0.00	0.00	
g) Existing #5 H2S: S-4435	0.00	0.00	0.00	0.00	0.00	
h) Existing No. 1 SRU: S-4227	-1.86	-12.82	-69.35	-1.88	0.00	
h) Existing No. 2 SRU: S-4228	-5.98	-17.20	-21.63	-2.40	0.00	
h) Existing No. 3 SRU: S-4229	-10.50	-27.63	-117.63	-3.69	0.00	
hh) New No. 1 SRU: S-4227	8.20	19.85	44.91	0.58	0.00	
hh) New No. 2 SRU: S-4228	8.59	20.71	38.35	0.58	0.00	
hh) New No. 3 SRU: S-4229	17.59	43.24	64.26	1.16	0.00	
i) Existing No. 1 SRU Stack Gas Heater: S-4192	-4.05	0.00	13.06	-0.21	-0.15	
i) Existing No. 2 SRU Stack Gas Heater: S-4193	-4.72	0.00	-23.52	-0.20	-0.15	
i) Existing No. 3 SRU Stack Gas Heater: S-4194	-8.31	0.00	25.75	-0.32	-0.23	
ii) New No. 1 SRU Stack Gas Heater: S-4192	1.53	0.00	8.39	1.04	0.76	
ii) New No. 2 SRU Stack Gas Heater: S-4193	1.40	0.00	6.26	1.04	0.76	
ii) New No. 3 SRU Stack Gas Heater: S-4194	3.53	0.00	12.90	1.83	1.32	
j) Existing Sulfur Loading Rack: S-4396	0.00	0.00	0.00	0.00	0.00	
k) New SRU Amine Regenerator: S-NEW	0.00	0.00	0.00	0.00	0.00	
l) New Oxygen Generator: S-NEW (exempt)	0.00	0.00	0.00	0.00	0.00	
m) New Sulfur Degassing Vessel: S-NEW???	0.00	0.00	0.00	0.00	0.00	
n) New Acid Gas Scrubber: S-NEW???	0.00	0.00	0.00	0.00	0.00	
o) New Sulfur Loading Rack: S-NEW	0.00	0.01	0.00	0.01	0.00	
Net Hydrogen Purity Project (Incl. TKO Debottlenecks)	5.42	25.97	-18.25	-2.46	6.20	0.00
Combined SRUs and Stack Heaters	NOx	SOx	CO	PM	VOC	
Existing No. 1 SRU & Stack Heater	-5.91	-12.82	-56.28	-2.10	-0.15	
Existing No. 2 SRU & Stack Heater	-10.71	-17.20	-45.15	-2.60	-0.15	
Existing No. 3 SRU & Stack Heater	-18.81	-27.63	-91.88	-4.01	-0.23	
New No. 1 SRU & Stack Heater	9.73	19.85	53.30	1.62	0.76	
New No. 2 SRU & Stack Heater	10.00	20.71	44.62	1.62	0.76	
New No. 3 SRU & Stack Heater	21.13	43.24	77.16	2.99	1.32	

Sources	Emissions Increases (tons/year)					
	NOx	SOx	CO	PM	VOC	Toxics
1. Hydrogen Plant Replacement						
a) Existing H2 Plant: S-4250	0.00	0.00	0.00	0.00	0.00	
b) Existing 20 Plant PSA/HRU: S-4348	0.00	0.00	0.00	0.00	0.00	
c) New Hydrogen Plant (2 Trains): S-NEW	0.00	0.00	0.00	0.00	6.50	
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	0.00	0.00	0.00	0.00	0.00	
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	0.00	0.00	0.00	0.00	0.00	
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	0.00	0.00	0.00	0.00	0.00	
d) H2 Plant Train 1 Reformer Furnace: S-NEW	26.63	0.72	32.05	10.34	11.60	
e) H2 Plant Train 2 Reformer Furnace: S-NEW	26.63	0.72	32.05	10.34	11.60	
a) New H2 Plant Feed Furnaces: S-NEW...	0.00	0.00	0.00	0.00	0.00	
f) H2 Recovery Unit (new front-end PSA): S-NEW	0.00	0.00	0.00	0.00	0.00	
g) New Cooling Tower: S-NEW	0.00	0.00	0.00	1.97	0.00	
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	0.00	0.00	0.00	0.00	0.00	
h) New Flare: S-NEW	11.61	0.04	27.40	0.30	5.41	
i) New Startup Incinerator???: S-NEW	0.00	0.00	0.00	0.00	0.00	
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
l) Existing Fuel Gas System SO2	0.00	0.00	0.00	0.00	0.00	
m) New Fuel Gas System SO2	0.00	49.09	0.00	0.00	0.00	
Net Hydrogen Plant Replacemen	64.88	50.57	91.51	22.95	35.11	0.00
2. Power Plant Replacement (Include Repower Existing)	NOx	SOx	CO	PM	VOC	Toxics
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4138	0.00	0.00	0.00	0.00	0.00	
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
d) New H2 Plant Cogen Unit: S-NEW	0.00	0.00	0.00	0.00	0.00	
e) New 4th Cogen Unit (option): S-NEW	33.91	1.67	33.02	27.41	10.89	
f) Cogen Cooling Tower (S-NEW)	0.00	0.00	0.00	0.09	0.00	
Net Power Plant Replacement (Include Repower Existing)	33.91	1.67	33.02	27.50	10.89	0.00
3. Reformer Replacement	NOx	SOx	CO	PM	VOC	Toxics
a) Existing #4 Rheniformer: S-4283	0.00	0.00	0.00	0.00	0.00	
b) Existing #5 Rheniformer: S-4237	0.00	0.00	0.00	0.00	0.00	
c) New Continuous Catalytic Reformer: S-NEW	1.80	1.80	7.50	0.14	5.87	
a) Existing #4 Rhen Furnaces F-3850/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	0.00	0.00	0.00	0.00	0.00	
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	0.00	0.00	0.00	0.00	0.00	
c) New CCR Furnaces S-NEW, S-NEW, S- NEW, S-NEW (S-NEW?)	13.31	0.00	16.20	16.32	11.81	
Net Reformer Replacement	15.11	1.80	23.70	16.46	17.67	0.00
4. Hydrogen Purity Project (Incl. TKO Debottlenecks)	NOx	SOx	CO	PM	VOC	Toxics
a) Existing TKC: S-4253	0.00	0.00	0.00	0.00	0.00	
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	0.00	0.00	0.00	0.00	0.00	
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
d) New TKC Recycle H2 Amine Contactor: S-NEW	0.00	0.00	0.00	0.00	3.89	
e) NEW Amine Tank: S-NEW	0.00	0.00	0.00	0.00	0.00	
f) Existing #4 H2S: S-4434	0.00	0.00	0.00	0.00	0.00	
g) Existing #5 H2S: S-4435	0.00	0.00	0.00	0.00	0.00	
h) Existing No. 1 SRU: S-4227	0.00	0.00	0.00	0.00	0.00	
h) Existing No. 2 SRU: S-4228	0.00	0.00	0.00	0.00	0.00	
h) Existing No. 3 SRU: S-4229	0.00	0.00	0.00	0.00	0.00	
hh) New No. 1 SRU: S-4227	8.20	19.85	44.91	0.58	0.00	
hh) New No. 2 SRU: S-4228	8.59	20.71	38.35	0.58	0.00	
hh) New No. 3 SRU: S-4229	17.59	43.24	64.26	1.16	0.00	
i) Existing No. 1 SRU Stack Gas Heater: S-4192	0.00	0.00	13.06	0.00	0.00	
i) Existing No. 2 SRU Stack Gas Heater: S-4193	0.00	0.00	0.00	0.00	0.00	
i) Existing No. 3 SRU Stack Gas Heater: S-4194	0.00	0.00	25.75	0.00	0.00	
ii) New No. 1 SRU Stack Gas Heater: S-4192	1.53	0.00	8.39	1.04	0.76	
ii) New No. 2 SRU Stack Gas Heater: S-4193	1.40	0.00	6.26	1.04	0.76	
ii) New No. 3 SRU Stack Gas Heater: S-4194	3.53	0.00	12.90	1.83	1.32	
j) Existing Sulfur Loading Rack: S-4396	0.00	0.00	0.00	0.00	0.00	
k) New SRU Amine Regenerator: S-NEW	0.00	0.00	0.00	0.00	0.00	
l) New Oxygen Generator: S-NEW (exempt)	0.00	0.00	0.00	0.00	0.00	
m) New Sulfur Degassing Vessel: S-NEW???	0.00	0.00	0.00	0.00	0.00	
n) New Emergency Scrubber: S-NEW???	0.00	0.00	0.00	0.00	0.00	
o) New Sulfur Loading Rack: S-NEW	0.00	0.01	0.00	0.01	0.00	
Net Hydrogen Purity Project (Incl. TKO Debottlenecks)	40.85	83.61	213.89	6.24	6.73	0.00
Combined SRUs and Stack Heaters	NOx	SOx	CO	PM	VOC	
Existing No. 1 SRU & Stack Heater	0.00	0.00	13.06	0.00	0.00	
Existing No. 2 SRU & Stack Heater	0.00	0.00	0.00	0.00	0.00	
Existing No. 3 SRU & Stack Heater	0.00	0.00	25.75	0.00	0.00	
New No. 1 SRU & Stack Heater	9.73	19.85	53.30	1.62	0.76	
New No. 2 SRU & Stack Heater	10.00	20.71	44.62	1.62	0.76	
New No. 3 SRU & Stack Heater	21.13	43.24	77.16	2.99	1.32	

Sources	Emissions Decreases (tons/year)					
	NOx	SOx	CO	PM	VOC	Toxics
1. Hydrogen Plant Replacement						
a) Existing H2 Plant: S-4250	0.00	0.00	10.22	0.00	9.69	
b) Existing 20 Plant PSA/HRU: S-4348	0.00	0.00	0.00	0.00	0.00	
c) New Hydrogen Plant (2 Trains): S-NEW	0.00	0.00	0.00	0.00	0.00	
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	31.63	0.00	20.26	25.90	13.30	
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	37.22	0.00	10.00	15.36	11.90	
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	3.35	0.00	1.44	1.01	0.79	
d) H2 Plant Train 1 Reformer Furnace: S-NEW	0.00	0.00	0.00	0.00	0.00	
e) H2 Plant Train 2 Reformer Furnace: S-NEW	0.00	0.00	0.00	0.00	0.00	
a) New H2 Plant Feed Furnaces: S-NEW...	0.00	0.00	0.00	0.00	0.00	
f) H2 Recovery Unit (new front-end PSA): S-NEW	0.00	0.00	0.00	0.00	0.00	
g) New Cooling Tower: S-NEW	0.00	0.00	0.00	0.00	0.00	
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	0.00	0.00	0.00	0.00	0.00	
h) New Flare: S-NEW	0.00	0.00	0.00	0.00	0.00	
i) New Startup Incinerator???: S-NEW	0.00	0.00	0.00	0.00	0.00	
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
l) Existing Fuel Gas System SO2	0.00	102.39	0.00	0.00	0.00	
m) New Fuel Gas System SO2	0.00	0.00	0.00	0.00	0.00	
Net Hydrogen Plant Replacemen	72.20	102.39	41.92	42.27	35.67	0.00
2. Power Plant Replacement (Include Repower Existing)	NOx	SOx	CO	PM	VOC	Toxics
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4138	47.43	0.00	2.80	13.36	9.87	
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
d) New H2 Plant Cogen Unit: S-NEW	0.00	0.00	0.00	0.00	0.00	
e) New 4th Cogen Unit (option): S-NEW	0.00	0.00	0.00	0.00	0.00	
f) Cogen Cooling Tower (S-NEW)	0.00	0.00	0.00	0.00	0.00	
Net Power Plant Replacement (Include Repower Existing)	47.43	0.00	2.80	13.36	9.87	0.00
3. Reformer Replacement	NOx	SOx	CO	PM	VOC	Toxics
a) Existing #4 Rheniformer: S-4283	0.02	0.03	1.17	0.00	2.70	
b) Existing #5 Rheniformer: S-4237	0.02	0.03	1.25	0.00	2.38	
c) New Continuous Catalytic Reformer: S-NEW	0.00	0.00	0.00	0.00	0.00	
a) Existing #4 Rhen Furnaces F-3850/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	34.86	0.00	2.06	8.43	6.53	
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	32.25	0.00	3.47	6.97	5.40	
c) New CCR Furnaces S-NEW, S-NEW, S- NEW, S-NEW (S-NEW?)	0.00	0.00	0.00	0.00	0.00	
Net Reformer Replacement	67.14	0.05	7.95	15.41	17.02	0.00
4. Hydrogen Purity Project (Incl. TKO Debottlenecks)	NOx	SOx	CO	PM	VOC	Toxics
a) Existing TKC: S-4253	0.00	0.00	0.00	0.00	0.00	
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	0.00	0.00	0.00	0.00	0.00	
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
d) New TKC Recycle H2 Amine Contactor: S-NEW	0.00	0.00	0.00	0.00	0.00	
e) NEW Amine Tank: S-NEW	0.00	0.00	0.00	0.00	0.00	
f) Existing #4 H2S: S-4434	0.00	0.00	0.00	0.00	0.00	
g) Existing #5 H2S: S-4435	0.00	0.00	0.00	0.00	0.00	
h) Existing No. 1 SRU: S-4227	1.86	12.82	69.35	1.88	0.00	
h) Existing No. 2 SRU: S-4228	5.98	17.20	21.63	2.40	0.00	
h) Existing No. 3 SRU: S-4229	10.50	27.63	117.63	3.69	0.00	
hh) New No. 1 SRU: S-4227	0.00	0.00	0.00	0.00	0.00	
hh) New No. 2 SRU: S-4228	0.00	0.00	0.00	0.00	0.00	
hh) New No. 3 SRU: S-4229	0.00	0.00	0.00	0.00	0.00	
i) Existing No. 1 SRU Stack Gas Heater: S-4192	4.05	0.00	0.00	0.21	0.15	
i) Existing No. 2 SRU Stack Gas Heater: S-4193	4.72	0.00	23.52	0.20	0.15	
i) Existing No. 3 SRU Stack Gas Heater: S-4194	8.31	0.00	0.00	0.32	0.23	
ii) New No. 1 SRU Stack Gas Heater: S-4192	0.00	0.00	0.00	0.00	0.00	
ii) New No. 2 SRU Stack Gas Heater: S-4193	0.00	0.00	0.00	0.00	0.00	
ii) New No. 3 SRU Stack Gas Heater: S-4194	0.00	0.00	0.00	0.00	0.00	
j) Existing Sulfur Loading Rack: S-4396	0.00	0.00	0.00	0.00	0.00	
k) New SRU Amine Regenerator: S-NEW	0.00	0.00	0.00	0.00	0.00	
l) New Oxygen Generator: S-NEW (exempt)	0.00	0.00	0.00	0.00	0.00	
m) New Sulfur Degassing Vessel: S-NEW???	0.00	0.00	0.00	0.00	0.00	
n) New Emergency Scrubber: S-NEW???	0.00	0.00	0.00	0.00	0.00	
o) New Sulfur Loading Rack: S-NEW	0.00	0.00	0.00	0.00	0.00	
Net Hydrogen Purity Project (Incl. TKO Debottlenecks)	35.43	57.64	232.13	8.70	0.53	0.00
Combined SRUs and Stack Heaters	NOx	SOx	CO	PM	VOC	
Existing No. 1 SRU & Stack Heater	5.91	12.82	69.35	2.10	0.15	
Existing No. 2 SRU & Stack Heater	10.71	17.20	45.15	2.60	0.15	
Existing No. 3 SRU & Stack Heater	18.81	27.63	117.63	4.01	0.23	
New No. 1 SRU & Stack Heater	0.00	0.00	0.00	0.00	0.00	
New No. 2 SRU & Stack Heater	0.00	0.00	0.00	0.00	0.00	
New No. 3 SRU & Stack Heater	0.00	0.00	0.00	0.00	0.00	

Attachment AQ-12A
Chevron Refinery Renewal Project
Net Emission Increases

Net Emissions Tables

Rev: 21
Baseline ending: 6/30/2005
Printed: 9/19/07 11:14 AM

Table X.a

Projects	Net Emissions (lbs/day)					
	NOx	SOx	CO	PM	VOC	Total
Hydrogen Plant Replacement	-40	-284	272	-106	-3	-161
Power Plant Replacement	-74	9	166	77	6	184
Reformer Replacement	-285	10	86	6	4	-180
Hydrogen Purity Improvements	30	142	-100	-13	34	93
Renewal Project Total	-370	-123	424	-36	40	-65

RLOP Cap Limits (Condition #459)

	Limit (typical actual) Tons/Year					
	NOx Current	NOx 9x10 adj.	SOx	CO	PM	VOC
Refinery Only	5,641 (3125)	*1,515 (650)*	389 (121)	710 (343)	273 (187)	324 (134)
Wharf Only	405 (489)	405 (489)	707 (721)	52 (61)	56 (60)	65 (140)
Refinery plus Wharf	6,046 (3,614)	*1,920 (1,139)*	1,096 (842)	762 (404)	329 (247)	388 (275)

Does not include FCC, F-135, tanks, and fugitives

Table X.b

	Net Emissions (tons/year)					
	NOx	SOx	CO	PM	VOC	Total
Hydrogen Plant Replacement	-7.33	-51.81	49.59	-19.33	-0.57	-29.44
Power Plant Replacement	-13.52	1.67	30.22	14.14	1.02	33.53
Reformer Replacement	-52.04	1.75	15.75	1.05	0.66	-32.83
Hydrogen Purity Improvements	5.42	25.97	-18.25	-2.46	6.20	16.88
Renewal Project Total	-67.47	-22.43	77.32	-6.60	7.31	-11.86
TKN/Poly NOx Reduction (LNB Instal.)	-45.07					-45.07
Total Incl. TKN/Poly NOx Reduction	-112.54	-22.43	77.32	-6.60	7.31	-56.93

Emission Reduction Credit Bank

Certificate # (origination date)	Tons/Year					
	NOx	SOx	CO	PM	VOC	
765 (3/18/92)	10.6	0.1	2.1	0.5	0.0	3/15/1992
904 (4/24/92)	5.0	0.1	1.0	0.3	1.8	4/24/1992
917 (7/14/92)	36.2	133.8	485.5	31.1	24.7	7/14/1992
223 (1/7/93)	20.7	1.0	9.1	5.4	60.1	1/7/1993
817 (9/15/93)	8.8	0.5	7.4	1.5	68.9	9/15/1993
766 (12/2/94)	0.0	0.0	0.0	0.0	65.3	12/2/1994
901 (1/27/95)	0.0	0.0	0.0	0.0	6.5	1/27/1995
900 (4/1/96)	1.0	0.1	0.5	0.3	0.0	4/1/1996
489 (11/18/96)	71.4	0.0	0.0	0.0	0.0	11/18/1996
584 (7/8/98)	0.0	0.0	0.0	0.0	0.2	7/8/1998
777 (11/2/01)	0.0	0.0	0.0	0.0	15.4	11/2/2001
588 (3/3/99)--Chev Chem	31.8	0.0	2.1	0.0	0.0	3/3/1999
Total	185.5	135.6	507.7	39.1	242.8	

Sources	Net Emissions (tons/year)					
	NOx	SOx	CO	PM	VOC	
1. Hydrogen Plant Replacement						
a) Existing H2 Plant: S-4250	0.00	0.00	-10.22	0.00	-9.69	
b) Existing 20 Plant PSA/HRU: S-4348	0.00	0.00	0.00	0.00	0.00	
c) New Hydrogen Plant (2 Trains): S-NEW	0.00	0.00	0.00	0.00	6.50	
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	-31.63	0.00	-20.26	-25.90	-13.30	
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	-37.22	0.00	-10.00	-15.36	-11.90	
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	-3.35	0.00	-1.44	-1.01	-0.79	
d) H2 Plant Train 1 Reformer Furnace: S-NEW	26.83	0.72	32.05	10.34	11.60	
e) H2 Plant Train 2 Reformer Furnace: S-NEW	26.83	0.72	32.05	10.34	11.60	
a) New H2 Plant Feed Furnaces: S-NEW...	0.00	0.00	0.00	0.00	0.00	
f) H2 Recovery Unit (new front-end PSA): S-NEW	0.00	0.00	0.00	0.00	0.00	
g) New Cooling Tower: S-NEW	0.00	0.00	0.00	1.87	0.00	
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	0.00	0.00	0.00	0.00	0.00	
h) New Flare: S-NEW	11.81	0.04	27.40	0.30	5.41	
l) New Startup Incinerator???: S-NEW	0.00	0.00	0.00	0.00	0.00	
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	0.00	0.00	0.00	0.00	0.00	
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	0.00	0.00	0.00	0.00	0.00	
l) Existing Fuel Gas System SO2	0.00	-102.39	0.00	0.00	0.00	
m) New Fuel Gas System SO2	0.00	49.58	0.00	0.00	0.00	
Net Hydrogen Plant Replacement	**-7.33**	**-51.81**	**49.59**	**-19.33**	**-0.57**	**0.00**
2. Power Plant Replacement (Include Repower Existing)	NOx	SOx	CO	PM	VOC	
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	-47.43	0.00	-2.80	-13.36	-9.87	
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	0.00	0.00	0.00	0.00	0.00	
d) New H2 Plant Cogen Unit: S-NEW	0.00	0.00	0.00	0.00	0.00	
e) New 3rd Cogen Unit (option):S-NEW	33.91	1.67	33.02	14.14	10.89	
f) Cogen Cooling Tower (S-NEW)	0.00	0.00	0.00	0.00	0.00	
Net Power Plant Replacement (Include Repower Existing)	**-13.52**	**1.67**	**30.22**	**14.14**	**1.02**	**0.00**
3. Reformer Replacement	NOx	SOx	CO	PM	VOC	
a) Existing #4 Rheniformer: S-4283	-0.02	-0.03	-1.17	0.00	-2.70	
b) Existing #5 Rheniformer: S-4237	-0.02	-0.03	-1.25	0.00	-2.38	
c) New Continuous Catalytic Reformer: S-NEW	1.80	1.80	7.50	0.14	5.87	
a) Existing #4 Rhen Furnaces F-3550/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	-34.86	0.00	-2.06	-8.43	-6.53	
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	-32.25	0.00	-3.47	-6.97	-5.40	
c) New CCR Furnaces S-NEW, S- NEW, S- NEW, S-NEW (S-NEW?)	12.31	0.00	15.20	10.32	11.61	
Net Reformer Replacement	**-52.04**	**1.75**	**15.75**	**1.05**	**0.66**	**0.00**
4. Hydrogen Purity Project (Incl. TKC Debottleneck)	NOx	SOx	CO	PM	VOC	
a) Existing TKC: S-4253	0.00	0.00	0.00	0.00	0.00	
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	0.00	0.00	0.00	0.00	0.00	
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
e) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	0.00	0.00	0.00	0.00	0.00	
d) New TKC Recycle H2 Amine Contactor: S-NEW	0.00	0.00	0.00	0.00	3.89	
e) NEW Amine Tank: S-NEW	0.00	0.00	0.00	0.00	0.00	
f) Existing #4 H2S: S-4434	0.00	0.00	0.00	0.00	0.00	
g) Existing #5 H2S: S-4435	0.00	0.00	0.00	0.00	0.00	
h) Existing No. 1 SRU: S-4227	-1.86	-12.82	-69.35	-1.88	0.00	
h) Existing No. 2 SRU: S-4228	-5.98	-17.20	-21.63	-2.40	0.00	
h) Existing No. 3 SRU: S-4229	-10.50	-27.63	-117.63	-3.69	0.00	
hh) New No. 1 SRU: S-4227	8.20	19.65	44.91	0.58	0.00	
hh) New No. 2 SRU: S-4228	4.89	20.71	38.25	0.58	0.00	
hh) New No. 3 SRU: S-4229	17.59	43.24	84.28	1.16	0.00	
f) Existing No. 1 SRU Stack Gas Heater: S-4192	-4.05	0.00	13.06	-0.21	-0.15	
f) Existing No. 2 SRU Stack Gas Heater: S-4193	-4.72	0.00	-23.52	-0.20	-0.15	
f) Existing No. 3 SRU Stack Gas Heater: S-4194	-8.31	0.00	25.75	-0.32	-0.23	
ff) New No. 1 SRU Stack Gas Heater: S-4192	1.63	0.00	6.53	1.04	0.76	
ff) New No. 2 SRU Stack Gas Heater: S-4193	1.40	0.00	6.25	1.04	0.76	
ff) New No. 3 SRU Stack Gas Heater: S-4194	3.55	0.00	12.90	1.83	1.32	
j) Existing Sulfur Loading Rack: S-4396	0.00	0.00	0.00	0.00	0.00	
k) New SRU Amine Regenerator: S-NEW	0.00	0.00	0.00	0.00	0.00	
l) New Oxygen Generator: S-NEW (exempt)	0.00	0.00	0.00	0.00	0.00	
m) New Sulfur Degassing Vessel: S-NEW???	0.00	0.00	0.00	0.00	0.00	
n) New Acid Gas Scrubber: S-NEW???	0.00	0.00	0.00	0.00	0.00	
o) New Sulfur Loading Rack: S-NEW	0.00	0.01	0.00	0.01	0.00	
Net Hydrogen Purity Project (Incl. TKC Debottleneck)	**5.42**	**25.97**	**-18.25**	**-2.46**	**6.20**	**0.00**
Combined SRUs and Stack Heaters	NOx	SOx	CO	PM	VOC	
Existing No. 1 SRU & Stack Heater	-5.91	-12.82	-56.28	-2.10	-0.15	
Existing No. 2 SRU & Stack Heater	-10.71	-17.20	-45.15	-2.60	-0.15	
Existing No. 3 SRU & Stack Heater	-18.81	-27.63	-91.88	-4.01	-0.23	
New No. 1 SRU & Stack Heater	9.73	19.65	53.30	1.62	0.76	
New No. 2 SRU & Stack Heater	10.00	20.71	44.62	1.62	0.76	
New No. 3 SRU & Stack Heater	21.13	43.24	77.16	2.99	1.32	
Change No. 1 SRU & Stack Heater	3.82	6.83	-2.99	-0.47	0.60	
Change No. 2 SRU & Stack Heater	-0.71	3.52	-0.54	-0.98	0.61	
Change No. 3 SRU & Stack Heater	2.31	15.61	-14.72	-1.02	1.09	

PSD Triggers

Pollutant	NOx	SOx	CO	PM	VOC
PSD Trigger (tons/year)	40	40	100	25	40
Pollutant	PM-10	H2S	TRS	RS	H2SO4
PSD Trigger (tons/year)	15	10	10	10	7

Note Shading indicates emissions for which Chevron proposes establishing limits.

Limits for SRU and associated stack heater must be combined.

CEQA Significance Levels

Pollutant	NOx	SOx	CO	PM	VOC
CEQA Significance Level (tons/yr)	15	N/A	100	15	15

Attachment AQ-12A
Chevron Refinery Renewal Project
NOx Emissions

Sources	NOx Emissions								
1. Hydrogen Plant Replacement		Baseline			Permit/Potential			Net NOx
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing H2 Plant: S-4250	Value	50,166			0	--	0	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
b) Existing 20 Plant PSA/HRU: S-4348	Value	2,980			0	--	0	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
c) New Hydrogen Plant (2 Trains): S-NEW	Value	0	--	0	102,200			0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	Value	4,932,983	0.0128	31.63	0	--	0	-31.63
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	Value	4,414,649	0.0169	37.22	0	--	0	-37.22
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	Value	291,564	0.0230	3.35	0	--	0	-3.35
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) H2 Plant Train 1 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00661	26.63	26.63
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) H2 Plant Train 2 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00661	26.63	26.63
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
a) New H2 Plant Feed Furnaces: S-NEW...	Value	0	--	0	0	0.00608	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) H2 Recovery Unit (new front-end PSA): S-NEW	Value	0	--	0	18,250		0	0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
g) New Cooling Tower: S-NEW	Value	0	0	0	18,922	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	Value		0	0	0	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
h) New Flare: S-NEW	Value	0	--	0	327,821	0.0708	11.61	11.61
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) New Startup Incinerator???: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	911,634	0.1130	51.50	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	202,362	0.2500	25.30	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	0	--	0	1,603,080	0.0320	25.65	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	0	--	0.00	367,920	0.0330	6.07	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Hydrogen Plant Replacement	**Value**	**10,753,193**		**149.00**	**18,417,221**		**96.60**	**-7.33**
2. Power Plant Replacement (Include Repower Existing)		**Baseline**			**Permit/Potential**			**Net NOx**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	Value	3,585,535	0.0265	47.43	0	--	0	-47.43
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	0.0092	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New H2 Plant Cogen Unit: S-NEW cancelled	Value	0	--	0	0	0.0092	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) New 3rd Cogen Unit (option):S-NEW	Value	0	--	0	7,358,400	0.00922	33.91	33.91
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) Cogen Cooling Tower: S-NEW	Value	0	0	0	1,892	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
Net Power Plant Replacement (Include Repower Existing)	**Value**	**3,585,535**		**47.43**	**7,358,400**		**33.91**	**-13.52**
3. Reformer Replacement		**Baseline**			**Permit/Potential**			**Net NOx**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing #4 Rheniformer: S-4283	Value	8,467,156	4.14E-06	0.02	0	--	0	-0.02
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing #5 Rheniformer: S-4237	Value	9,051,274	4.14E-06	0.02	0	--	0	-0.02
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) New Continuous Catalytic Reformer: S-NEW	Value	0	--	0	27,375,000	1.32E-04	1.80	1.80

Attachment AQ-12A
Chevron Refinery Renewal Project
NOx Emissions

	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
a) Existing #4 Rhen Furnaces F-3550/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	Value	2,423,281	0.0288	34.86	0	--	0	-34.86
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	Value	2,003,990	0.0322	32.25	0	--	0	-32.25
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) New CCR Furnaces S-NEW, S- NEW, S- NEW, S-NEW	Value	0	--	0	4,380,000	0.00608	13.31	13.31
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Reformer Replacement	**Value**	**4,427,271**		**67.14**	**4,380,000**		**15.11**	**-52.04**
4. Hydrogen Purity Project (incl. TKC Debottleneck)		**Baseline**			**Permit/Potential**			**Net NOx**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing TKC: S-4253	Value	15,575,802		0	29,200,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	Value	0		0	22,265,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value	1,304,577	0.0305	19.87	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value	0	--	0	2,146,200	0.0305	32.69	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New TKC Recycle H2 Amine Contactor: S-NEW	Value	0	--	0	2,190		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
e) NEW Amine Tank: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	gal/min	lb/gal	T/yr	gal/min	lb/gal	T/yr	T/yr
f) Existing #4 H2S: S-4434	Value	1,212		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
g) Existing #5 H2S: S-4435	Value	1,865		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
h) Existing No. 1 SRU: S-4227	Value	35,904	0.1035	1.86	0	--	0	-1.86
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 2 SRU: S-4228	Value	45,696	0.2619	5.98	0	--	0	-5.98
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 3 SRU: S-4229	Value	70,311	0.2988	10.50	0	--	0	-10.50
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 1 SRU: S-4227	Value	0	--	0	55,042	0.2979	8.20	8.20
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 2 SRU: S-4228	Value	0	--	0	55,042	0.3122	8.59	8.59
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 3 SRU: S-4229	Value	0	--	0	110,048	0.3198	17.59	17.59
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
i) Existing No. 1 SRU Stack Gas Heater: S-4192	Value	0.075	53.96	4.05	0	--	0	-4.05
	(Units) Basis	MMSCF/hr stkhtr flu gas	T/MMSCF stkhtr flu gas	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 2 SRU Stack Gas Heater: S-4193	Value	0.088	53.95	4.72	0	--	0	-4.72
	(Units) Basis	MMSCF/hr stkhtr flu gas	T/MMSCF stkhtr flu gas	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 3 SRU Stack Gas Heater: S-4194	Value	0.170	49.01	8.31	0	--	0	-8.31
	(Units) Basis	MMSCF/hr stkhtr flu gas	T/MMSCF stkhtr flu gas	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 1 SRU Stack Gas Heater: S-4192	Value	0	--	0	280,320	0.01092	1.53	1.53
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 2 SRU Stack Gas Heater: S-4193	Value	0	--	0	280,320	0.01001	1.40	1.40
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 3 SRU Stack Gas Heater: S-4194	Value	0	--	0	490,560	0.0144	3.53	3.53
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing Sulfur Loading Rack: S-4396	Value	151,911	0	0	0	0	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
k) New SRU Amine Regenerator: S-NEW	Value	0	--	0	3,358		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
l) New Oxygen Generator: S-NEW (exempt)	Value	0	--	0				0.00
	(Units) Basis			T/yr			T/yr	T/yr
m) New Sulfur Degassing Vessel: S-NEW???	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
n) New Acid Gas Scrubber: S-NEW???	Value	0	--	0				0.00
	(Units) Basis	MMSCFD	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
o) New Sulfur Loading Rack: S-NEW	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
Net Hydrogen Purity Project (incl. TKC Debottleneck)	**Value**	**1,304,577**		**55.30**	**3,197,400**		**73.54**	**5.42**

Attachment AQ-12A
Chevron Refinery Renewal Project
SO2 Emissions

Sources		SO2 Emissions							
1. Hydrogen Plant Replacement		Baseline			Permit/Potential			Net SO2
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing H2 Plant: S-4250	Value	50,166			0	--	0.00	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
b) Existing 20 Plant PSA/HRU: S-4348	Value	2,980			0	--	0.00	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
c) New Hydrogen Plant (2 Trains): S-NEW	Value	0	--	0	102,200			0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
f) H2 Recovery Unit (new front-end PSA): S-NEW	Value	0	--	0	18,250	0.00000	0.00	0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
g) New Cooling Tower: S-NEW	Value		0	0	18,922	0	0.00	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	Value		0	0	0	0	0.00	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
h) New Flare: S-NEW	Value	0	--	0	26,280	0.0031	0.04	0.04
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) New Startup Incinerator???: S-NEW	Value	0	--	0			0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Hydrogen Plant Replacement	**Value**	**0**		**0.00**	**18,615,000**		**0.04**	**0.04**
	(Units) Basis	MMBTU/yr			MMBTU/yr			
2. Power Plant Replacement (Include Repower Existing)		Baseline			Permit/Potential			Net SO2
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
F) Cogen Cooling Tower (S-NEW)			0	0	1,892	0	0.00	0.00
		MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
Net Power Plant Replacement (Include Repower Existing)	**Value**	**12,350,067**		**0.00**	**27,191,040**		**0.00**	**0.00**
	(Units) Basis	MMBTU/yr			MMBTU/yr			
3. Reformer Replacement		Baseline			Permit/Potential			Net SO2
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing #4 Rheniformer: S-4283	Value	8,467,156	5.94E-06	0.03	0	--	0	-0.03
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing #5 Rheniformer: S-4237	Value	9,051,274	5.94E-06	0.03	0	--	0	-0.03
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) New Continuous Catalytic Reformer: S-NEW	Value	0	--	0	27,375,000	1.32E-04	1.80	1.80
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
Net Reformer Replacement	**Value**	**0**		**0.05**	**5,899,334**		**1.80**	**1.75**
	(Units) Basis	MMBTU/yr			MMBTU/yr			
4. Hydrogen Purity Project (Incl. TKC Debottleneck)		Baseline			Permit/Potential			Net SO2
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing TKC: S-4253	Value	15,575,802		0	23,725,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	Value	0		0	22,265,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
d) New TKC Recycle H2 Amine Contactor: S-NEW	Value	0	--	0	2,190		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
e) NEW Amine Tank: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	gal/min	lb/gal	T/yr	gal/min	lb/gal	T/yr	T/yr
f) Existing #4 H2S: S-4434	Value	1,212		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
g) Existing #5 H2S: S-4435	Value	1,865		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
h) Existing No. 1 SRU: S-4227	Value	35,904	0.71394	12.82	0	--	0	-12.82
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 2 SRU: S-4228	Value	45,696	0.75260	17.20	0	--	0	-17.20
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 3 SRU: S-4229	Value	70,311	0.78583	27.63	0	--	0	-27.63
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 1 SRU: S-4227	Value	0	--	0	55,042	0.71394	19.65	19.65
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 2 SRU: S-4228	Value	0	--	0	55,042	0.75260	20.71	20.71
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 3 SRU: S-4229	Value	0	--	0	110,048	0.78583	43.24	43.24
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
i) Existing No. 1 SRU Stack Gas Heater: S-4192	Value	280,320	0	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 2 SRU Stack Gas Heater: S-4193	Value	280,320	0	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 3 SRU Stack Gas Heater: S-4194	Value	490,560	0	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 1 SRU Stack Gas Heater: S-4192	Value	--	0	0	280,320	0	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 2 SRU Stack Gas Heater: S-4193	Value	--	0	0	280,320		0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 3 SRU Stack Gas Heater: S-4194	Value	--	0	0	490,560		0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing Sulfur Loading Rack: S-4396	Value	35,904	0	0	0	0	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
k) New SRU Amine Regenerator: S-NEW	Value	0	--	0	3,358		0	0.00

Attachment AQ-12A
Chevron Refinery Renewal Project
SO2 Emissions

				(Units)	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
l) New Oxygen Generator: S-NEW (exempt)				Basis							
				Value	0	--	0				0.00
				(Units)			T/yr			T/yr	T/yr
				Basis							
m) New Sulfur Degassing Vessel: S-NEW???				Value	0	--	0	310,250			0.00
				(Units)	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
				Basis							
n) New Acid Gas Scrubber: S-NEW???				Value	0	--	0				0.00
				(Units)	MMSCFD	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
				Basis							
o) New Sulfur Loading Rack: S-NEW				Value	0	--	0	310,250			0.01
				(Units)	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
				Basis							
Net Hydrogen Purity Project (incl. TKC Debottleneck)				**Value**	0		**57.64**	2,146,200		**83.60**	**25.97**

Baseline Fuel Gas SO2 Emissions to be Banked:

Mix Drum	Total MMBTU/yr	Reg 9-10 MMBTU/yr	Total SO2 tons/year
V-475	18,104,529		41.78
V-870	12,950,972		39.52
V-701	7,069,805		21.09
Total	38,125,305	0	102.39

Future 3 H2S Adjustments:

Baseline sweet gas make, MMSCFD	21.94			
Matching FCC feed rate, MBD	88.38			
Normalize gas make to 80 MBD feed, MMSCFD	25.67			
3 H2S sweet gas:				
H2S content, ppmv	26.26			
Non-H2S TRS content, ppmv	3.41			
Total TRS content, ppmv	29.66			
SO2 from H2S, lb SO2/MMSCF sweet gas	4.434			
SO2 from other TRS, lb SO2/MMSCF sweet gas	0.584			
Total SO2, lb SO2/MMSCF sweet gas	5.018			
Future SO2 from 3 H2S sweet gas, tons/year	23.50			
Round up for FCC sulfur contingency	25.00			
One high month, tons/year	118.97			
Composite year (11 mo low, 1 mo high), tons/yr	32.83			
Allowance for unplanned hyd plt S/D's, tons/yr	7.83			
Allowance for LPG burn, tons/year	6.17			
Allowance for natural gas, tons/year	5.09			
Contingency, tons/year	5.00			
Adjusted Future Fuel Gas SO2, tons/year	49.09		49.09	
Totals		102.39	49.09	-53.29

Add SO2 from hydrogen plant feed clean-up breakthrough

1. From Fuel	6/28/2006	5/23/2007
Fuel rate per plant, SCF/hr	46000	94000
Total sulfur content (per PG&E spec), ppmv	17	17
Total sulfur content, grains/100 SCF	0.5	0.5
grains/lb	7000	7000
Density of natural gas, lb/SCF	0.0435	0.0435
Total sulfur content, ppmw	16.42	16.42
Fuel rate, lb/hr	2001	4089
Sulfur rate, lb/hr	0.0329	0.0671
Sulfur rate, lb/yr	288	588
SO2 emissions, lb/yr	558	1140
SO2 emissions per plant, T/Y	0.28	0.57
Total SO2 emissions, T/Y	0.56	1.14

2. From Feedstock		
(note: assumes 20 ppb breakthrough all the time)		
Feed rate per plant (D/S of S treat), SCFH	1911000	
Total sulfur content @ detection limit, ppbv	100	
Sulfur compounds, SCFH	0.191	
Sulfur compounds, SCF/yr	1674	
Lb SO2/SCF feedstock (source?)	0.17	
SO2 emissions, lb/yr	285	
SO2 emissions per plant, T/Y	0.14	
SO2 emissions (both trains), T/Y	0.28	0.30

3. Total		
Total SO2 emissions (both trains), T/Y	0.84	1.44
Total SO2 emissions (per train), T/Y	0.42	0.72

Add SO2 from LPG/nat gas to Cogen turbine

See Cogen LPG Sulfur Check.xls (T/Y)	1.67

Attachment AQ-12A
Chevron Refinery Renewal Project
CO Emissions

Sources	CO Emissions							
1. Hydrogen Plant Replacement		Baseline			Permit/Potential			Net CO
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing H2 Plant: S-4250	Value	50,166	0.40725	10.22	0	--	0	-10.22
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
b) Existing 20 Plant PSA/HRU: S-4348	Value	2,980			0	--	0	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
c) New Hydrogen Plant (2 Trains): S-NEW	Value	0	--	0	102,200			0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	Value	4,932,983	0.00822	20.26	0	--	0	-20.26
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	Value	4,414,649	0.00453	10.00	0	--	0	-10.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	Value	291,564	0.0099	1.44	0	--	0	-1.44
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) H2 Plant Train 1 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00795	32.05	32.05
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) H2 Plant Train 2 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00795	32.05	32.05
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
a) New H2 Plant Feed Furnaces: S-NEW...	Value	0	--	0	0	0.00740	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) H2 Recovery Unit (new front-end PSA): S-NEW	Value	0	--	0	18,250		0	0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
g) New Cooling Tower: S-NEW	Value	0	0	0	18,922	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	Value		0	0	0	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
h) New Flare: S-NEW	Value	0	--	0	327,821	0.1672	27.40	27.40
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) New Startup Incinerator???: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	911,634	0.0163	7.45	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	202,362	0.0163	1.65	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	0	--	0	1,603,080	0.0163	13.10	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	0	--	0.00	367,920	0.0163	3.01	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Hydrogen Plant Replacement	**Value**	**10,753,193**		**51.02**	**18,417,221**		**107.62**	**49.59**
2. Power Plant Replacement (Include Repower Existing)		**Baseline**			**Permit/Potential**			**Net CO**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	Value	3,585,535	0.00156	2.80	0	--	0	-2.80
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	0.0045	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New H2 Plant Cogen Unit: S-NEW cancelled	Value	0	--	0	0	0.0045	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) New 3rd Cogen Unit (option):S-NEW	Value	0	--	0	7,358,400	0.00898	33.02	33.02
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) Cogen Cooling Tower (S-NEW)	Value	0	0	0	1,892	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
Net Power Plant Replacement (Include Repower Existing)	**Value**	**3,585,535**		**2.80**	**7,358,400**		**33.02**	**30.22**
3. Reformer Replacement		**Baseline**			**Permit/Potential**			**Net CO**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing #4 Rheniformer: S-4283	Value	8,467,156	2.76E-04	1.17	0	--	0	-1.17
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing #5 Rheniformer: S-4237	Value	9,051,274	2.76E-04	1.25	0	--	0	-1.25
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) New Continuous Catalytic Reformer: S-NEW	Value	0	--	0	27,375,000	5.48E-04	7.5	7.50

Attachment AQ-12A
Chevron Refinery Renewal Project
CO Emissions

	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
a) Existing #4 Rhen Furnaces F-3550/60/70/80; S-4038, S-4039, S-4040, S-4041, resp	Value	2,423,281	0.00170	2.06	0	--	0	-2.06
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
h) Existing #5 Rhen Furnaces F-550/60/70/80; S-4042, S-4043, S-4044, S-4045, resp	Value	2,003,990	0.00346	3.47	0	--	0	-3.47
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) New CCR Furnaces S-NEW, S- NEW, S- NEW, S-NEW	Value	0	--	0	4,380,000	0.00740	16.20	16.20
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Reformer Replacement	**Value**	**4,427,271**		**7.95**	**4,380,000**		**23.70**	**15.75**
4. Hydrogen Purity Project (incl. TKC Debottleneck)		**Baseline**			**Permit/Potential**			**Net CO**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing TKC: S-4253	Value	15,575,802		0	29,200,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	Value	0		0	22,265,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) Existing TKC Furnaces F-410, F-420, F-710; S-4159, S-4160, S-4167, resp.	Value	1,304,577	0.0163	10.66	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Debottlenecked TKC Furnaces F-410, F-420, F-710; S-4159, S-4160, S-4167, resp.	Value	0	--	0	2,146,200	0.0163	17.54	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New TKC Recycle H2 Amine Contactor: S-NEW	Value	0	--	0	2,190		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
e) NEW Amine Tank: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	gal/min	lb/gal	T/yr	gal/min	lb/gal	T/yr	T/yr
f) Existing #4 H2S: S-4434	Value	1,212		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
g) Existing #5 H2S: S-4435	Value	1,865		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
h) Existing No. 1 SRU: S-4227	Value	35,904	3.8630	69.35	0	--	0	-69.35
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 2 SRU: S-4228	Value	45,696	0.9468	21.63	0	--	0	-21.63
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 3 SRU: S-4229	Value	70,311	3.3460	117.63	0	--	0	-117.63
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 1 SRU: S-4227	Value	0	--	0	55,042	1.6320	44.91	44.91
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 2 SRU: S-4228	Value	0	--	0	55,042	1.3935	38.35	38.35
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 3 SRU: S-4229	Value	0	--	0	110,048	1.1678	64.26	64.26
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
i) Existing No. 1 SRU Stack Gas Heater: S-4192	Value	0.075	-174.13	-13.06	0	--	0	13.06
	(Units) Basis	MMSCF/hr stkhtr flu gas	T/MMSCF stkhtr flu gas	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 2 SRU Stack Gas Heater: S-4193	Value	0.088	268.63	23.52	0	--	0	-23.52
	(Units) Basis	MMSCF/hr stkhtr flu gas	T/MMSCF stkhtr flu gas	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 3 SRU Stack Gas Heater: S-4194	Value	0.170	-151.91	-25.75	0	--	0	25.75
	(Units) Basis	MMSCF/hr stkhtr flu gas	T/MMSCF stkhtr flu gas	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 1 SRU Stack Gas Heater: S-4192	Value	0	--	0	280,320	0.0598	8.39	8.39
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 2 SRU Stack Gas Heater: S-4193	Value	0	--	0	280,320	0.0447	6.26	6.26
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 3 SRU Stack Gas Heater: S-4194	Value	0	--	0	490,560	0.0526	12.90	12.90
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing Sulfur Loading Rack: S-4396	Value	151,911	0	0	0	0	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
k) New SRU Amine Regenerator: S-NEW	Value	0	--	0	3,358		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
l) New Oxygen Generator: S-NEW (exempt)	Value	0	--	0				0.00
	(Units) Basis			T/yr			T/yr	T/yr
m) New Sulfur Degassing Vessel: S-NEW???	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
n) New Acid Gas Scrubber: S-NEW???	Value	0	--	0				0.00
	(Units) Basis	MMSCFD	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
o) New Sulfur Loading Rack: S-NEW	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
Net Hydrogen Purity Project (incl. TKC Debottleneck)	**Value**	**1,304,577**		**203.98**	**3,197,400**		**192.61**	**-18.25**

Attachment AQ-12A
Chevron Refinery Renewal Project
PM10 Emissions

Sources	PM Emissions							
1. Hydrogen Plant Replacement		Baseline			Permit/Potential			Net PM
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing H2 Plant: S-4250	Value	50,166			0	--	0	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
b) Existing 20 Plant PSA/HRU: S-4348	Value	2,980			0	--	0	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
c) New Hydrogen Plant (2 Trains): S-NEW	Value	0	--	0	102,200			0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	Value	4,932,983	0.01050	25.90	0	--	0	-25.90
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	Value	4,414,649	0.00696	15.36	0	--	0	-15.36
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	Value	291,564	0.00696	1.01	0	--	0	-1.01
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) H2 Plant Train 1 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00257	10.34	10.34
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) H2 Plant Train 2 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00257	10.34	10.34
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
a) New H2 Plant Feed Furnaces: S-NEW...	Value	0	--	0	0	0.00745	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) H2 Recovery Unit (new front-end PSA): S-NEW	Value	0	--	0	18,250		0	0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
g) New Cooling Tower: S-NEW	Value	0	0	0	18,922	0.208	1.97	1.97
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	lb/MMgal	T/yr	T/yr
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	Value		0	0	0	--	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
h) New Flare: S-NEW	Value	0	--	0	80,526	0.00745	0.30	0.30
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) New Startup Incinerator???: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	911,634	0.00745	3.40	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	202,362	0.00745	0.75	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	0	--	0	1,603,080	0.00745	5.97	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	0	--	0.00	367,920	0.00745	1.37	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Hydrogen Plant Replacement	**Value**	**10,753,193**		**46.42**	**18,169,926**		**30.29**	**-19.33**
2. Power Plant Replacement (Include Repower Existing)		Baseline			Permit/Potential			Net PM
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	Value	3,585,535	0.00745	13.36	0	--	0	-13.36
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	0.00745	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New H2 Plant Cogen Unit: S-NEW cancelled	Value	0	--	0	0	0.00745	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) New 3rd Cogen Unit (option):S-NEW	Value	0	--	0	7,358,400	0.00745	27.41	27.41
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Cogen Wetted Media and NOx Steam	Value	0	0	0			0.09	0.09
	(Units) Basis	MMgal/yr	T/MMgal	T/yr			T/yr	T/yr
Net Power Plant Replacement (Include Repower Existing)	**Value**	**3,585,535**		**13.36**	**7,358,400**		**27.50**	**14.14**
3. Reformer Replacement		Baseline			Permit/Potential			Net PM
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing #4 Rheniformer: S-4283	Value	8,467,156	0	0	0	--	0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing #5 Rheniformer: S-4237	Value	9,051,274	0	0	0	--	0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) New Continunus Catalytic Reformer: S-NEW	Value	0	--	0	27,375,000	--	0.14	0.14

Attachment AQ-12A
Chevron Refinery Renewal Project
PM10 Emissions

	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
a) Existing #4 Rhen Furnaces F-3550/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	Value	2,423,281	0.00696	8.43	0	--	0	-8.43
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	Value	2,003,990	0.00696	6.97	0	--	0	-6.97
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) New CCR Furnaces S-NEW, S- NEW, S- NEW, S-NEW	Value	0	--	0	4,380,000	0.00745	16.32	16.32
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Reformer Replacement	**Value**	**4,427,271**		**15.41**	**4,380,000**		**16.46**	**1.05**
4. Hydrogen Purity Project (incl. TKC Debottleneck)		**Baseline**			**Permit/Potential**			**Net PM**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing TKC: S-4253	Value	15,575,802		0	29,200,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	Value	0		0	22,265,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value	1,304,577	0.00745	4.86	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value	0	--	0	2,146,200	0.00745	8.00	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New TKC Recycle H2 Amine Contactor: S-NEW	Value	0	--	0	2,190		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
e) NEW Amine Tank: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	gal/min	lb/gal	T/yr	gal/min	lb/gal	T/yr	T/yr
f) Existing #4 H2S: S-4434	Value	1,212		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
g) Existing #5 H2S: S-4435	Value	1,865		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
h) Existing No. 1 SRU: S-4227	Value	35,904	0.10496	1.88	0	--	0	-1.88
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 2 SRU: S-4228	Value	45,696	0.10496	2.40	0	--	0	-2.40
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 3 SRU: S-4229	Value	70,311	0.10496	3.69	0	--	0	-3.69
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 1 SRU: S-4227	Value	0	--	0	82,125	--	0.58	0.58
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 2 SRU: S-4228	Value	0	--	0	82,125	--	0.58	0.58
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 3 SRU: S-4229	Value	0	--	0	164,250	--	1.16	1.16
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
i) Existing No. 1 SRU Stack Gas Heater: S-4192	Value	57,488	0.00745	0.21	0	--	0	-0.21
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 2 SRU Stack Gas Heater: S-4193	Value	54,268	0.00745	0.20	0	--	0	-0.20
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 3 SRU Stack Gas Heater: S-4194	Value	84,622	0.00745	0.32	0	--	0	-0.32
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 1 SRU Stack Gas Heater: S-4192	Value	0	--	0	280,320	0.00745	1.04	1.04
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 2 SRU Stack Gas Heater: S-4193	Value	0	--	0	280,320	0.00745	1.04	1.04
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 3 SRU Stack Gas Heater: S-4194	Value	0	--	0	490,560	0.00745	1.83	1.83
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing Sulfur Loading Rack: S-4396	Value	151,911	0	0	0	0	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
k) New SRU Amine Regenerator: S-NEW	Value	0	--	0	3,358		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
l) New Oxygen Generator: S-NEW (exempt)	Value	0	--	0				0.00
	(Units) Basis			T/yr			T/yr	T/yr
m) New Sulfur Degassing Vessel: S-NEW???	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
n) New Acid Gas Scrubber: S-NEW???	Value	0	--	0				0.00
	(Units) Basis	MMSCFD	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
o) New Sulfur Loading Rack: S-NEW	Value	0	--	0	310,250		0.01	0.01
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
Net Hydrogen Purity Project (incl. TKC Debottleneck)	**Value**	**1,500,954**		**13.56**	**3,197,400**		**14.24**	**-2.46**

Attachment AQ-12A
Chevron Refinery Renewal Project
VOC Emissions

Sources	Total VOC Emissions							
1. Hydrogen Plant Replacement		Baseline			Permit/Potential			Net VOC
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing H2 Plant: S-4250	Value			9.69			0.00	-9.69
	(Units) Basis			T/yr			T/yr	T/yr
b) Existing 20 Plant PSA/HRU: S-4348	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
c) New Hydrogen Plant (2 Trains): S-NEW	Value			0.00			6.50	6.50
	(Units) Basis			T/yr			T/yr	T/yr
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	Value			13.30			0	-13.30
	(Units) Basis			T/yr			T/yr	T/yr
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	Value			11.90			0.00	-11.90
	(Units) Basis			T/yr			T/yr	T/yr
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	Value			0.79			0.00	-0.79
	(Units) Basis			T/yr			T/yr	T/yr
d) H2 Plant Train 1 Reformer Furnace: S-NEW	Value			0.00			11.60	11.60
	(Units) Basis			T/yr			T/yr	T/yr
e) H2 Plant Train 2 Reformer Furnace: S-NEW	Value			0.00			11.60	11.60
	(Units) Basis			T/yr			T/yr	T/yr
a) New H2 Plant Feed Furnaces: S-NEW...	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
f) H2 Recovery Unit (new front-end PSA): S-NEW	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
g) New Cooling Tower: S-NEW	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
h) New Flare: S-NEW	Value			0.00			5.41	5.41
	(Units) Basis			T/yr			T/yr	T/yr
i) New Startup Incinerator???: S-NEW	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value			0.00			0.00	
	(Units) Basis			T/yr			T/yr	T/yr
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value			0.00			0.00	
	(Units) Basis			T/yr			T/yr	T/yr
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value			0.00			0.00	
	(Units) Basis			T/yr			T/yr	T/yr
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value			0.00			0.00	
	(Units) Basis			T/yr			T/yr	T/yr
Net Hydrogen Plant Replacement	**Value**			**35.67**			**35.11**	**-0.57**
2. Power Plant Replacement (Include Repower Existing)		**Baseline**			**Permit/Potential**			**Net VOC**
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	Value			9.87			0.00	-9.87
	(Units) Basis			T/yr			T/yr	T/yr
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
d) New H2 Plant Cogen Unit: S-NEW cancelled	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
e) New 3rd Cogen Unit (option):S-NEW	Value			0.00			10.89	10.89
	(Units) Basis			T/yr			T/yr	T/yr
f) Cogen Cooling Tower (S-NEW)	Value			0.00			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
Net Power Plant Replacement (Include Repower Existing)	**Value**			**9.87**			**10.89**	**1.02**
3. Reformer Replacement		**Baseline**			**Permit/Potential**			**Net VOC**
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing #4 Rheniformer: S-4283	Value			2.70			0.00	-2.70
	(Units) Basis			T/yr			T/yr	T/yr
b) Existing #5 Rheniformer: S-4237	Value			2.38			0.00	-2.38
	(Units) Basis			T/yr			T/yr	T/yr
c) New Continuous Catalytic Reformer: S-NEW	Value			0.00			5.87	5.87

Attachment AQ-12A
Chevron Refinery Renewal Project
VOC Emissions

	(Units) Basis			T/yr			T/yr	T/yr
a) Existing #4 Rhen Furnaces F-3550/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	Value			6.53			0.00	-6.53
	(Units) Basis			T/yr			T/yr	T/yr
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	Value			5.40			0.00	-5.40
	(Units) Basis			T/yr			T/yr	T/yr
c) New CCR Furnaces S-NEW, S- NEW, S- NEW, S-NEW	Value			0.00			11.81	11.81
	(Units) Basis			T/yr			T/yr	T/yr
Net Reformer Replacement	**Value**			**17.02**			**17.67**	**0.66**
4. Hydrogen Purity Project (incl. TKC Debottleneck)		**Baseline**			**Permit/Potential**			**Net VOC**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing TKC: S-4253	Value			0.00			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value			0.00			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value			0			0.00	0.00
	(Units) Basis			T/yr			T/yr	T/yr
d) New TKC Recycle H2 Amine Contactor: S-NEW	Value			0			3.89	3.89
	(Units) Basis			T/yr			T/yr	T/yr
e) NEW Amine Tank: S-NEW	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
f) Existing #4 H2S: S-4434	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
g) Existing #5 H2S: S-4435	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
h) Existing No. 1 SRU: S-4227	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
h) Existing No. 2 SRU: S-4228	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
h) Existing No. 3 SRU: S-4229	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
hh) New No. 1 SRU: S-4227	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
hh) New No. 2 SRU: S-4228	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
hh) New No. 3 SRU: S-4229	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
i) Existing No. 1 SRU Stack Gas Heater: S-4192	Value			0.15			0	-0.15
	(Units) Basis			T/yr			T/yr	T/yr
i) Existing No. 2 SRU Stack Gas Heater: S-4193	Value			0.15			0	-0.15
	(Units) Basis			T/yr			T/yr	T/yr
i) Existing No. 3 SRU Stack Gas Heater: S-4194	Value			0.23			0	-0.23
	(Units) Basis			T/yr			T/yr	T/yr
ii) New No. 1 SRU Stack Gas Heater: S-4192	Value			0			0.76	0.76
	(Units) Basis			T/yr			T/yr	T/yr
ii) New No. 2 SRU Stack Gas Heater: S-4193	Value			0			0.76	0.76
	(Units) Basis			T/yr			T/yr	T/yr
ii) New No. 3 SRU Stack Gas Heater: S-4194	Value			0			1.32	1.32
	(Units) Basis			T/yr			T/yr	T/yr
j) Existing Sulfur Loading Rack: S-4396	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
k) New SRU Amine Regenerator: S-NEW	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
l) New Oxygen Generator: S-NEW (exempt)	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
m) New Sulfur Degassing Vessel: S-NEW???	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
n) New Acid Gas Scrubber: S-NEW???	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
o) New Sulfur Loading Rack: S-NEW	Value			0			0	0.00
	(Units) Basis			T/yr			T/yr	T/yr
Net Hydrogen Purity Project (incl. TKC Debottleneck)	**Value**			**0.53**			**6.73**	**6.20**

Attachment AQ-12A
Chevron Refinery Renewal Project
VOC Comb and Vent Emissions

Sources	VOC Comb & Vent Emissions							
1. Hydrogen Plant Replacement		Baseline			Permit/Potential			Net VOC
		Throughput	Em. Factor	Emission	Throughput	Em. Factor	Emission	Emissions
a) Existing H2 Plant: S-4250	Value	50,166	0.1857	4.66	0	--	0	-4.66
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
b) Existing 20 Plant PSA/HRU: S-4348	Value	2,980	--	0	0	--	0	0.00
	(Units) Basis	MMSCF/yr Prod Hyd	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
c) New Hydrogen Plant (2 Trains): S-NEW	Value	0	--	0	102,200	0.0000	0.00	0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCF/yr	lb/MMSCF	T/yr	T/yr
a) Existing H2 Plant Train A Reformer Furnace F-305: S-4170	Value	4,932,983	0.00539	13.30	0	--	0	-13.30
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing H2 Plant Train B Reformer Furnace F-355: S-4171	Value	4,414,649	0.00539	11.90	0	--	0	-11.90
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Existing H2 Plant Feed Furnaces F-320/30/40: S-4156, S-4157, S-4158, resp.	Value	291,564	0.00539	0.79	0	--	0	-0.79
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) H2 Plant Train 1 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00288	11.60	11.60
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) H2 Plant Train 2 Reformer Furnace: S-NEW	Value	0	--	0	8,059,200	0.00288	11.60	11.60
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
a) New H2 Plant Feed Furnaces: S-NEW...	Value	0	--	0	0	0.00539	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) H2 Recovery Unit (new front-end PSA): S-NEW	Value	0	--	0	18,250	--	0	0.00
	(Units) Basis	MMSCF/yr	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
g) New Cooling Tower: S-NEW	Value	0	0	0	18,922	0.00	0.00	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	lb/MMgal	T/yr	T/yr
gg) Existing Wax Cooling Towers: S-XXXX, S-XXXX, S-XXXX	Value		0	0	0	--	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
h) New Flare: S-NEW	Value	0	--	0	67,309	0.16080	5.41	5.41
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) New Startup Incinerator???: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	911,634	0.0054	0.00	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Existing Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	202,362	0.0054	0.00	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Low NOx Burners TKN Furnaces F-510/20/30: S-4161, S-4162, S-4163	Value	0	--	0	1,603,080	0.0054	0.00	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
k) Low NOx Burners Poly Plant Furnaces F-651, F-661: S-4188, S-4189	Value	0	--	0.00	367,920	0.0054	0.00	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Hydrogen Plant Replacement	**Value**	**10,753,193**		**30.65**	**18,156,709**		**28.61**	**-2.03**
2. Power Plant Replacement (Include Repower Existing)		**Baseline**			**Permit/Potential**			**Net VOC**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing Power Plant Boilers 1, 3, 4, 5 and 7: S-4129, S-4131, S-4132, S-4133, S-4135	Value	3,585,535	0.0054	9.67	0	--	0	-9.67
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	--	0	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Repowered Cogen Units/HRSGs: S-4350, S-4351, S-4352, S-4353,	Value	0	--	0	0	0.0026	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New H2 Plant Cogen Unit: S-NEW cancelled	Value	0	--	0	0	0.0026	0.00	0.00
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
e) New 3rd Cogen Unit (option):S-NEW	Value	0	--	0	7,358,400	0.00256	9.44	9.44
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
f) Cogen Cooling Tower (S-NEW)	Value	0	0	0	1,892	0	0	0.00
	(Units) Basis	MMgal/yr	T/MMgal	T/yr	MMgal/yr	T/MMgal	T/yr	T/yr
Net Power Plant Replacement (Include Repower Existing)	**Value**	**3,585,535**		**9.67**	**7,358,400**		**9.44**	**-0.23**
3. Reformer Replacement		**Baseline**			**Permit/Potential**			**Net VOC**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing #4 Rheniformer: S-4283	Value	8,467,156	6.90E-05	0.29	0	--	0	-0.29
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing #5 Rheniformer: S-4237	Value	9,051,274	6.90E-05	0.31	0	--	0	-0.31
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) New Continuous Catalytic Reformer: S-NEW	Value	0	--	0	27,375,000	1.32E-04	1.80	1.80

Attachment AQ-12A
Chevron Refinery Renewal Project
VOC Comb and Vent Emissions

	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
a) Existing #4 Rhen Furnaces F-3550/60/70/80: S-4038, S-4039, S-4040, S-4041, resp	Value	2,423,281	0.00539	6.53	0	--	0	-6.53
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
b) Existing #5 Rhen Furnaces F-550/60/70/80: S-4042, S-4043, S-4044, S-4045, resp	Value	2,003,990	0.00539	5.40	0	--	0	-5.40
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) New CCR Furnaces S-NEW, S- NEW, S- NEW, S-NEW	Value	0	--	0	4,380,000	0.00539	11.81	11.81
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
Net Reformer Replacement	Value	**4,427,271**		**12.54**	**4,380,000**		**13.61**	**1.07**
4. Hydrogen Purity Project (incl. TKC Debottleneck)		**Baseline**			**Permit/Potential**			**Net VOC**
		Throughput	**Em. Factor**	**Emission**	**Throughput**	**Em. Factor**	**Emission**	**Emissions**
a) Existing TKC: S-4253	Value	15,575,802		0	29,200,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
b) Existing TKN/ISO (recycle compressor upgrade): S-4252	Value	0		0	22,265,000		0	0.00
	(Units) Basis	B/yr	lb/B	T/yr	B/yr	lb/B	T/yr	T/yr
c) Existing TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value	1,304,577	0.0054	0.00	0	--	0	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
c) Debottlenecked TKC Furnaces F-410, F-420, F-710: S-4159, S-4160, S-4167, resp.	Value	0	--	0	2,146,200	0.0054	0.00	
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
d) New TKC Recycle H2 Amine Contactor: S-NEW	Value	0	--	0	2,190		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
e) NEW Amine Tank: S-NEW	Value	0	--	0			0	0.00
	(Units) Basis	gal/min	lb/gal	T/yr	gal/min	lb/gal	T/yr	T/yr
f) Existing #4 H2S: S-4434	Value	1,212		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
g) Existing #5 H2S: S-4435	Value	1,865		0	1,825		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
h) Existing No. 1 SRU: S-4227	Value	35,904	--	0	0	--	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 2 SRU: S-4228	Value	45,696	--	0	0	--	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
h) Existing No. 3 SRU: S-4229	Value	70,311	--	0	0	--	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 1 SRU: S-4227	Value	0	--	0	55,042	--	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 2 SRU: S-4228	Value	0	--	0	55,042	--	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
hh) New No. 3 SRU: S-4229	Value	0	--	0	110,048	--	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
i) Existing No. 1 SRU Stack Gas Heater: S-4192	Value	57,488	0.00539	0.15	0	--	0	-0.15
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 2 SRU Stack Gas Heater: S-4193	Value	54,268	0.00539	0.15	0	--	0	-0.15
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
i) Existing No. 3 SRU Stack Gas Heater: S-4194	Value	84,622	0.00539	0.23	0	--	0	-0.23
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 1 SRU Stack Gas Heater: S-4192	Value	0	--	0	280,320	0.00539	0.76	0.76
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 2 SRU Stack Gas Heater: S-4193	Value	0	--	0	280,320	0.00539	0.76	0.76
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
ii) New No. 3 SRU Stack Gas Heater: S-4194	Value	0	--	0	490,560	0.00539	1.32	1.32
	(Units) Basis	MMBTU/yr	lb/MMBTU	T/yr	MMBTU/yr	lb/MMBTU	T/yr	T/yr
j) Existing Sulfur Loading Rack: S-4396	Value	151,911	0	0	0	0	0	0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
k) New SRU Amine Regenerator: S-NEW	Value	0	--	0	3,358		0	0.00
	(Units) Basis	MMSCF/yr H2S	lb/MMSCF	T/yr	MMSCF/yr H2S	lb/MMSCF	T/yr	T/yr
l) New Oxygen Generator: S-NEW (exempt)	Value	0	--	0				0.00
	(Units) Basis			T/yr			T/yr	T/yr
m) New Sulfur Degassing Vessel: S-NEW???	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
n) New Acid Gas Scrubber: S-NEW???	Value	0	--	0				0.00
	(Units) Basis	MMSCFD	lb/MMSCF	T/yr	MMSCFD	lb/MMSCF	T/yr	T/yr
o) New Sulfur Loading Rack: S-NEW	Value	0	--	0	310,250			0.00
	(Units) Basis	LT/yr	lb/LT	T/yr	LT/yr	lb/LT	T/yr	T/yr
Net Hydrogen Purity Project (incl. TKC Debottleneck)	Value	**1,500,954**		**0.53**	**3,197,400**		**2.83**	**2.30**

ATTACHMENT AQ-12B

Attachment AQ-12B
Chevron Refinery Renewal Project
Heath Risk Modeling Inputs

Sub-Project	Source	Description	Model Point ID	Annual Average: Residential Cancer Risk Model Input (per million) (1)	Annual Average: Offsite Worker Cancer Risk Model Input (per million) (1)	Annual Average: Residential Chronic HI Model Input (2)	Annual Average: Offsite Worker Chronic HI Model Input (2)	1-hr Average: Acute HI Model Input (1)	Monthly Avg.: Lead (based on max hourly emission rate), g/s	POINT SOURCE PARAMETERS: Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (F)	Exit Velocity (m/s)	Stack Diameter (m)
Reformer Replacement	S-4038 & S4039 Shutdown Note 1	4 Rhen W (F-3550 & F-3560) Total	4038	-6.08E-01	-1.71E-01	-1.14E-02	-8.29E-03	-1.99E-04	-1.20E-04	4038	#4 Rhen (F-3550 & 3560)	553658.75	4199370	4.6	57.00	450	13.30	2.59
Reformer Replacement	S-4040 & S4041 Shutdown Note 2	4 Rhen E (F-3570 & F-3580) Total	4040	-2.56E-01	-7.20E-02	-4.79E-03	-3.49E-03	-8.35E-05	-5.05E-05	4040	#4 Rhen (F-3570 & 3580)	553665.69	4199374	4.6	57.00	450	13.30	2.59
Reformer Replacement	S-4042 & S-4043 Shutdown	5 Rhen W Furnaces F-550 & F-560	4042	-3.57E-01	-1.01E-01	-6.69E-03	-4.87E-03	-1.17E-04	-7.05E-05	4042	#5 Rhen (F-550 & 560)	553580.38	4199317.5	5	62.18	450	9.60	2.67
Reformer Replacement	S-4044 & S-4045 Shutdown	5 Rhen E Furnaces F-570 & F-580	4044	-3.57E-01	-1.01E-01	-6.69E-03	-4.87E-03	-1.17E-04	-7.05E-05	4044	#5 Rhen (F-570 & 580)	553590.06	4199323	5	62.18	450	9.60	2.67
Power Plant Replacement	S-4129 Shutdown	No. 1 Power Plant - 1 Boiler	4129	-2.00E-01	-5.64E-02	-3.75E-03	-2.73E-03	-6.53E-05	-3.95E-05	4129	#1 POWER PLT-1 Boiler	553603.13	4198916	6.3	37.49	450	1.20	2.44
Power Plant Replacement	S-4131 Shutdown	No. 1 Power Plant - 3 Boiler	4131	-2.91E-01	-8.19E-02	-5.44E-03	-3.96E-03	-9.50E-05	-5.74E-05	4131	#1 POWER PLT-3 Boiler	553614.5	4198904	7	38.10	450	1.20	2.44
Power Plant Replacement	S-4132 Shutdown	No. 1 Power Plant - 4 Boiler	4132	-2.52E-01	-7.09E-02	-4.72E-03	-3.44E-03	-8.24E-05	-4.98E-05	4132	#1 POWER PLT-4 Boiler	553614.5	4198904	7	38.10	450	1.20	2.44
Power Plant Replacement	S-4133 Shutdown	No. 1 Power Plant - 5 Boiler	4133	-2.49E-01	-7.02E-02	-4.67E-03	-3.40E-03	-8.14E-05	-4.92E-05	4133	#1 POWER PLT-5 Boiler	553631.38	4198889	6	38.10	450	1.20	2.44
Power Plant Replacement	S-4135 Shutdown	No. 1 Power Plant - 7 Boiler	4135	-2.86E-01	-8.05E-02	-5.35E-03	-3.90E-03	-9.33E-05	-5.64E-05	4135	#1 POWER PLT-7 Boiler	553645.44	4198874.5	6.1	38.10	450	1.20	1.83
Hydrogen Plant Replacement	S-4158 Shutdown	F-340 Feed Furnace	4158	-1.04E-01	-2.93E-02	-1.95E-03	-1.42E-03	-3.39E-05	-2.05E-05	4158	H2 Plt F-340	553191.44	4200221	2.7	29.26	700	9.90	1.22
Hydrogen Purity	S-4159 & S-4160 Modified	TKC F-410/420	4159	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4159	TKC F-410 & 420 Furnace	[illegible]	4200309.5	4.6	41.76	885	12.00	1.91
Hydrogen Plant Replacement	S-4161, S-4162, S-4163 Modified	F-500 TIO Furnaces	4161	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4161	TIO F-510/520/530	[illegible]	4200349.5	3.4	40.84	870	15.25	2.29
Hydrogen Purity	S-4167 Modified	TKC F-740	4167	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4167	TKC F-740	552907.13	4200291.5	4.5	41.15	865	13.87	2.13
Hydrogen Plant Replacement	S-4170 Shutdown	F-305 A Train Reformer Furnace	4170	-1.76E+00	-4.95E-01	-3.45E-02	-2.43E-02	-6.74E-04	-3.47E-04	4170	Reformer F-305 A Train	553126.59	4200271.7	2.7	49.38	700	16.20	1.83
Hydrogen Plant Replacement	S-4171 Shutdown	F-355 B Train Reformer Furnace	4171	-1.57E+00	-4.43E-01	-2.95E-02	-2.15E-02	-5.14E-04	-3.11E-04	4171	Reformer F-355 B Train	553146.78	4200254.7	2.7	49.38	700	16.20	1.83
Hydrogen Plant Replacement	S-4188 Modified	[illegible] Poly Furnace	4188	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4188	F-651 Polymer Furnace/Low NC	[illegible]	[illegible]	3.4	30.48	740	14.06	0.91
Hydrogen Plant Replacement	S-4189 Modified	[illegible] Poly Furnace	4189	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4189	F-661 Polymer Furnace/Low NC	[illegible]	[illegible]	3.4	30.18	400	7.81	0.91
Hydrogen Purity	S-4227 & S-4192 Modified Note 3	1 SRU & Stack Heater	4192	8.13E-02	2.29E-02	-1.66E-01	-3.65E-02	-1.68E-03	2.00E-05	4192	SRU PLANTS	552360.31	4200403.5	3.4	65.00	600	14.64	0.98
Hydrogen Purity	S-4228 & S-4193 Modified Note 3	2 SRU & Stack Heater	4193	7.69E-02	2.17E-02	-1.46E-01	-3.20E-02	-1.47E-03	1.91E-05	4193	SRU PLANTS	552383	4200387	3.4	65.00	600	14.64	0.98
Hydrogen Purity	S-4229 & S-4194 Modified Note 3	3 SRU & Stack Heater	4194	1.50E-01	4.21E-02	-2.19E-01	-4.77E-02	-2.53E-05	3.64E-05	4194	SRU PLANTS	552379.19	4200341.5	3.4	65.00	600	16.40	1.22
Regeneration Reformer	S-4237 Shutdown	5 Rhen Regen Vent	4237	-2.98E-03	-5.95E-04	-2.21E-02	-4.95E-03	-3.88E-05	0.00E+00	4237	#5 Rhen vent	553571.92	4199286.4	5.2	10.67	400	20.00	0.30
Regeneration Reformer	S-4283 Shutdown	4 Rhen Regen Vent	4283	-2.80E-03	-5.60E-04	-2.07E-02	-4.63E-03	-3.63E-05	0.00E+00	4283	#4 Rhen vent	553670.78	4199344.5	4.7	10.67	400	20.00	0.30
Power Plant Replacement	S-4350 & S-4351 Modified	No. 1 Power Plant - Cogen 1	4350	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4350	#1 POWER PLT-Cogen 1	[illegible]	4199164	4.3	50.60	850	37.15	3.66
Power Plant Replacement	S-4352 & S-4353 Modified	No. 1 Power Plant - Cogen 2	4352	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4352	#1 POWER PLT-Cogen 2	552707.29	4199194.9	4.7	50.60	800	41.52	3.46
	S-4396 Modified	Sulfur Loading Rack	4396	0.00E+00	0.00E+00	6.94E-05	1.55E-05	1.10E-04	0.00E+00	4396	Sulfur Loading Racks	552543.39	4200525.3	3.4	15.24	100	1.60	0.20
Hydrogen Plant	S-4449 New	Deaerator Vent	4449	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4449	H2 Plt - Deaerator Vent	553323.81	4199750	4.3	25.91	70	6.12	0.36
Regeneration Reformer	S-4452 New	CCR Regen Vent	4452	1.97E-01	4.67E-02	1.22E-01	2.74E-02	2.65E-04	0.00E+00	4452	CCR Vent	553403.17	4199521.2	5.2	15.24	350	7.57	0.20
Hydrogen Plant	S-4465 New	Hyd Plt Cooling Tower	4465	2.52E-03	5.00E-04	4.01E-05	8.98E-06	3.71E-06	0.00E+00	4465	H2 Plt Cooling Tower 4 Cells	553343.5	4199728	4.3	7.62	85	1.80	7.62
Hydrogen Plant Replacement	S-4471 New	Hyd Plt Train 1 Reformer Furnace	4471	2.87E+00	8.09E-01	5.35E-02	3.91E-02	1.11E-03	5.85E-04	4471	H2 Plt Train 1 Reformer Furnace	553364.06	4199647	4.4	35.05	330	22.85	2.79
Hydrogen Plant Replacement	S-4472 New	Hyd Plt Train 2 Reformer Furnace	4472	2.87E+00	8.09E-01	5.35E-02	3.91E-02	1.11E-03	5.85E-04	4472	H2 Plt Train 2 Reformer Furnace	553317.06	4199732.5	4.3	35.05	330	22.85	2.79
Power Plant Replacement	S-4475 & S-4476 New	No. 1 Power Plant - Cogen 4	4475	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4475	#1 POWER PLT-Cogen 4	553628.67	4199149.2	4.9	38.40	800	41.36	3.66
Power Plant Replacement	S-4473 & S-4474 New	No. 1 Power Plant - Cogen 3	4473	6.11E+00	1.21E+00	6.70E-01	4.26E-01	2.44E-02	0.00E+00	4473	#1 POWER PLT-Cogen 3	553690.84	4199213.9	4.9	50.60	200	14.41	3.66
Reformer Replacement	S-4477, S-4478, S-4479 & S-4480 New	CCR Furnaces	4477	1.56E+00	4.40E-01	3.71E-02	2.31E-02	3.85E-03	6.19E-04	4477	CCR Furnaces	553392.86	4199567.7	4.7	86.87	375	6.84	4.82
Hydrogen Plant Replacement	S-6020 New	Flare Pilot/Purge	6020	2.40E-02	6.76E-03	4.59E-04	3.29E-04	4.40E-04	2.89E-04	6020	H2 FLARE-model as flare	553396	4199804	4.6	75.76	1832	20.00	3.80
Hydrogen Plant	S-4250 Shutdown	A Train CO2 Vent	4250A	0.00E+00	0.00E+00	-3.29E-05	-7.37E-06	-5.64E-06	0.00E+00									
Hydrogen Plant	S-4250 Shutdown	A Train Deaerator Vent	4250A	0.00E+00	0.00E+00	-5.73E-07	-1.28E-07	-9.82E-08	0.00E+00									
Hydrogen Plant	S-4250 Shutdown	A Train CO2 and Deaerator Vent Combined	4250A	0.00E+00	0.00E+00	-3.35E-05	-7.49E-06	-5.74E-06	0.00E+00	4250A	H2 Plt A Train Vent	553088.54	4200224.2	3	25.91	120	9.80	0.508
Hydrogen Plant	S-4250 Shutdown	B Train CO2 Vent	4250B	0.00E+00	0.00E+00	-3.29E-05	-7.37E-06	-5.64E-06	0.00E+00									
Hydrogen Plant	S-4250 Shutdown	B Train Deaerator Vent	4250B	0.00E+00	0.00E+00	-5.73E-07	-1.28E-07	-9.82E-08	0.00E+00									
Hydrogen Plant	S-4250 Shutdown	B Train CO2 and Deaerator Vent Combined	4250B	0.00E+00	0.00E+00	-3.35E-05	-7.49E-06	-5.74E-06	0.00E+00	4250B	H2 Plt B Train Vent	553108.73	4200207.2	3.2	25.91	120	9.80	0.508
Power Plant Fugitives	S-4129 fugitive Shutdown	No. 1 Power Plant - 1 Boiler	4129FUG	-6.93E-05	-1.37E-05	-3.97E-07	-8.88E-08	-7.13E-08	0.00E+00									
Power Plant Fugitives	S-4131 fugitive Shutdown	No. 1 Power Plant - 3 Boiler	4129FUG	-6.93E-05	-1.37E-05	-3.97E-07	-8.88E-08	-7.13E-08	0.00E+00									
Power Plant Fugitives	S-4132 fugitive Shutdown	No. 1 Power Plant - 4 Boiler	4129FUG	-6.93E-05	-1.37E-05	-3.97E-07	-8.88E-08	-7.13E-08	0.00E+00	FUGITIVE AREA SOURCE PARAMETERS								
Power Plant Fugitives	S-4133 fugitive Shutdown	No. 1 Power Plant - 5 Boiler	4129FUG	-6.93E-05	-1.37E-05	-3.97E-07	-8.88E-08	-7.13E-08	0.00E+00	Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North
Power Plant Fugitives	S-4135 fugitive Shutdown	No. 1 Power Plant - 7 Boiler	4129FUG	-6.93E-05	-1.37E-05	-3.97E-07	-8.88E-08	-7.13E-08	0.00E+00									
Power Plant Fugitives	S-4129, 4131, 4132, 4133 & 4135 fugitive Shutdown	No. 1 Power Plant - 1, 3, 4, 5 & 7 Boiler Combined	4129FUG	-3.47E-04	-6.84E-05	-1.98E-06	-4.44E-07	-3.56E-07	0.00E+00	4129FUG	#1 Power Plt Boilers Combined	553608.81	4198936.5	5.2	1.98	64.6	16.60	43
H2 Purity Fugitives	S-4227, S-4228, & S4229 fugitive Modified	SRU's	4227FUG / 4228FUG / 4229FUG	0.00E+00	0.00E+00	5.86E-03	1.31E-03	7.56E-05	0.00E+00									
H2 Purity Fugitives	S-4227 fugitive Modified	1 SRU	4227FUG	0.00E+00	0.00E+00	1.95E-03	4.37E-04	2.52E-05	0.00E+00	4227FUG	S-4227 Fugitives SRU No. 1 Tra	552386.75	4200407	3.4	1.98	29.08	20.00	-50
H2 Purity Fugitives	S-4228 fugitive Modified	2 SRU	4228FUG	0.00E+00	0.00E+00	1.95E-03	4.37E-04	2.52E-05	0.00E+00	4228FUG	S-4228 Fugitive SRU No. 2 Trai	552406.44	4200390	3.4	1.98	29.08	20.00	-50
H2 Purity Fugitives	S-4229 fugitive Modified	3 SRU	4229FUG	0.00E+00	0.00E+00	1.95E-03	4.37E-04	2.52E-05	0.00E+00	4229FUG	S-4229 Fugitives SRU No. 3 Tra	552419.94	4200361	3.4	1.98	39.86	22.00	-50
Reformer Fugitives	S-4237 fugitive Shutdown	5 Rhen	4237FUG	-7.41E-02	-1.46E-02	-9.68E-05	-2.17E-05	-2.42E-06	0.00E+00	4237FUG	S4237 5 Rheniformer Fugitives	553566.13	4199268	5.2	1.98	30	28.00	-30
Hydrogen Plant Fugitives	S-4250 fugitive Shutdown	Hydrogen A Train	4250FUGA	-3.12E-03	-6.14E-04	-2.10E-05	-4.69E-06	-4.62E-06	0.00E+00									
Hydrogen Plant Fugitives	S-4250 fugitive Shutdown	Hydrogen B Train	4250FUGB	-5.76E-03	-1.14E-03	-3.45E-05	-7.72E-06	-6.62E-06	0.00E+00									
H2 Purity Fugitives	S-4250 fugitive Shutdown	Hydrogen A/B Trns (NH3 [illegible])	4250FUGA/B	0.00E+00	0.00E+00	-1.15E-06	-2.58E-07	-7.21E-08	0.00E+00									
Hydrogen Plant Fugitives	S-4250 fugitive Shutdown	Hydrogen A Train	4250FUGA	-3.12E-03	-6.14E-04	-2.15E-05	-4.82E-06	-4.66E-06	0.00E+00	4250FUGA	Hydrogen Train A S4250 Fugitiv	553078.63	4200200	3.7	1.98	65	15.00	-50
Hydrogen Plant Fugitives	S-4250 fugitive Shutdown	Hydrogen B Train	4250FUGB	-5.76E-03	-1.14E-03	-3.51E-05	-7.85E-06	-6.66E-06	0.00E+00	4250FUGB	Hydrogen Train B S4250 Fugitiv	553096.81	4200185	3.6	1.98	65	15.00	-50
H2 Purity Fugitives	S-4253 fugitive Modified	TKC	4253FUG	5.03E-02	9.92E-03	2.53E-03	5.65E-04	5.30E-05	0.00E+00	4253FUG	S-4253 Fugitive FCC Feed Hydr	552921.5	4200277.5	4.5	1.98	44.17		-50
Reformer Fugitives	S-4283 fugitive Shutdown	4 Rhen	4283FUG	-8.82E-02	-1.74E-02	-1.15E-04	-2.58E-05	-2.89E-06	0.00E+00	4283FUG	S4283 4 Rheniformer Fugitives	553665.06	4199325	4.7	1.98	30	28.00	-30
Power Plant Fugitives	S-4350 & S-4351 fugitive Modified	Cogen 1	4350FUG	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4350FUG	#1 Power Plt - Cogen 1	553740.06	4199140	4.3	1.98	40.44	20.00	-30
Power Plant Fugitives	S-4352 & S-4353 fugitive Modified	Cogen 2	4352FUG	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4352FUG	#1 Power Plt - Cogen 2	553720.84	4199177.5	4.8	1.98	40.44	20.00	-30
[illegible]	S-4393 fugitive Modified	[illegible]	4393FUG	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4393FUG	Bioreactor	553651.38	4199184.5	0	0	152.4		[illegible]
Hydrogen Plant Fugitives	S-4449 fugitive New	Hydrogen 1 Train	4449FUG	1.25E-02	2.47E-03	6.61E-05	1.48E-05	1.04E-05	0.00E+00									
Hydrogen Plant Fugitives	S-4450 fugitive New	Hydrogen 2 Train	4450FUG	1.25E-02	2.47E-03	6.61E-05	1.48E-05	1.04E-05	0.00E+00									
H2 Purity Fugitives	S-4449 and S-4450 fugitives New	Hydrogen 1/2 Trains (NH3 & H2S	4449FUG /	0.00E+00	0.00E+00	3.06E-06	6.84E-07	1.92E-07	0.00E+00									
Hydrogen Plant Fugitives	S-4449 fugitive New	Hydrogen 1 Train	4449FUG	1.25E-02	2.47E-03	6.77E-05	1.51E-05	1.05E-05	0.00E+00	4449FUG	H2 Plt Fugitives Train 1	553312.19	4199709	4.3	1.98	95	70.00	60
Hydrogen Plant Fugitives	S-4450 fugitive New	Hydrogen 2 Train	4450FUG	1.25E-02	2.47E-03	6.77E-05	1.51E-05	1.05E-05	0.00E+00	4450FUG	H2 Plt Fugitives Train 2	553264.75	4199791.5	4.3	1.98	95	70.00	60
Reformer Fugitives	S-4452 fugitive New	CCR	4452FUG	1.70E-01	3.35E-02	2.22E-04	4.97E-05	5.56E-06	0.00E+00									
H2 Purity Fugitives	S-4452 fugitive New	CCR	4452FUG	0.00E+00	0.00E+00	2.31E-06	5.16E-07	1.44E-07	0.00E+00									
Reformer Fugitives	S-4452 fugitive New	CCR	4452FUG	1.70E-01	3.35E-02	2.24E-04	5.02E-05	5.71E-06	0.00E+00	4452FUG	CCR Fugitives	553400.19	4199508	5.5	1.98	74.66		-30
Power Plant Fugitives	S-4473 & S-4474 fugitive New	Cogen 3	4473FUG	5.63E-03	1.11E-03	2.98E-05	6.67E-06	4.68E-06	0.00E+00									
Power Plant Fugitives	S-4475 & S-4476 fugitive New	Cogen 4	4475FUG	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00									
H2 Purity Fugitives	S-4475, S-4476, S-4473, & S-4474 fugitives New	Cogens - New	4475FUG / 4473FUG	0.00E+00	0.00E+00	2.31E-06	5.16E-07	1.44E-07	0.00E+00									
Power Plant Fugitives	S-4475 & S-4476 fugitive New	Cogen 4	4475FUG	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4475FUG	#1 Power Plt - Cogen 4	553701.81	4199208.5	4.9	1.98	44.17	22.00	-30
Power Plant Fugitives	S-4473 & S-4474 fugitive New	Cogen 3	4473FUG	5.63E-03	1.11E-03	3.21E-05	7.18E-06	4.83E-06	0.00E+00	4473FUG	#1 Power Plt - Cogen 3	553640.56	4199142.5	5.3	1.98	44.17	22.00	-30

Attachment AQ-12B
Chevron Refinery Renewal Project
Health Risk Values

Toxic Air Contaminant	Inhalation Cancer Potency Factor, (mg/kg d)$^{-1}$	Residential Unit Risk Value From HARP, (ug/m^3)$^{-1}$	Offsite Worker Unit Risk Value From HARP, (ug/m^3)$^{-1}$	Chronic Inhalation REL, (ug/m^3)	Residential HI per unit concentration, HI/(ug/m^3)	Offsite Worker HI per unit concentration, HI/(ug/m^3)	
Acetaldehyde	1.0E-02	2.90E-06	5.72E-07	9.0E+00	1.11E-01	2.49E-02	na
Ammonia @ 10 ppm slip	na	na	na	2.0E+02	5.00E-03	1.12E-03	3.2E+03
Arsenic	HARP	1.58E-02	5.18E-03	HARP	6.20E+01	5.94E+01	1.9E-01
Benzene	1.0E-01	2.90E-05	5.72E-06	6.0E+01	1.67E-02	3.73E-03	1.3E+03
Benzo(a)anthracene	HARP	1.65E-03	6.00E-04	na	na	na	na
Benzo(a)pyrene	HARP	1.65E-02	6.00E-03	na	na	na	na
Benzo(b)fluoranthene	HARP	1.65E-03	6.00E-04	na	na	na	na
Benzo(k)fluoranthene	HARP	1.65E-03	6.00E-04	na	na	na	na
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bromine & compounds	na	na	na	1.7E+00	5.88E-01	1.32E-01	na
1,3-Butadiene	6.0E-01	1.74E-04	3.43E-05	2.0E+01	5.00E-02	1.12E-02	na
Cadmium	1.5E+01	4.34E-03	8.57E-04	HARP	5.59E+01	5.49E+01	na
Carbon disulfide	na	na	na	8.0E+02	1.25E-03	2.80E-04	6.2E+03
Chlorine	na	na	na	2.0E-01	5.00E+00	1.12E+00	2.1E+02
Chloroform	1.9E-02	5.50E-06	1.09E-06	3.0E+02	3.33E-03	7.46E-04	1.5E+02
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	HARP	1.65E-04	6.00E-05	na	na	na	na
Copper	na	na	na	2.4E+00	4.17E-01	9.32E-02	1.0E+02
Cresols (Note 3)	na	na	na	6.0E+02	1.67E-03	3.73E-04	na
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Diethanolamine (DEA) (Note 3)	na	na	na	3.0E+00	3.33E-01	7.46E-02	na
Ethylbenzene (Note 3)	na	na	na	2.0E+03	5.00E-04	1.12E-04	na
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Formaldehyde	2.1E-02	6.08E-06	1.20E-06	3.0E+00	3.33E-01	7.46E-02	9.4E+01
n-Hexane	na	na	na	7.0E+03	1.43E-04	3.20E-05	na
Hydrogen chloride	na	na	na	9.0E+00	1.11E-01	2.49E-02	2.1E+03
Hydrogen sulfide	na	na	na	1.0E+01	1.00E-01	2.24E-02	4.2E+01
Indeno(1,2,3-cd)pyrene	HARP	1.65E-03	6.00E-04	na	na	na	na
Lead	HARP	3.58E-05	1.44E-05	Appendix F (BL	na	na	na
Manganese	na	na	na	2.0E-01	5.00E+00	1.12E+00	na
Mercury	na	na	na	HARP	5.76E+01	5.35E+01	1.8E+00
Methanol	na	na	na	4.0E+03	2.50E-04	5.59E-05	2.8E+04
Methyl tert-Butyl Ether (MTBE) (Note 3)	1.8E-03	5.21E-07	1.03E-07	8.0E+03	1.25E-04	2.80E-05	na
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Naphthalene	1.2E-01	3.48E-05	6.86E-06	9.0E+00	1.11E-01	2.49E-02	na
Nickel	9.1E-01	2.64E-04	5.20E-05	HARP	2.00E+01	2.00E+01	6.0E+00
Perchloroethylene (Note 3)	2.1E-02	6.08E-06	1.20E-06	3.5E+01	2.86E-02	6.39E-03	2.0E+04
Phenol	na	na	na	2.0E+02	5.00E-03	1.12E-03	5.8E+03
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Polychlorinated dioxins/furans	HARP	3.37E+02	8.10E+01	HARP	2.65E+05	1.73E+05	na
Propylene (Note 3)	na	na	na	3.0E+03	3.33E-04	7.46E-05	na
Selenium	na	na	na	2.0E+01	5.00E-02	1.12E-02	na
Styrene	na	na	na	9.0E+02	1.11E-03	2.49E-04	2.1E+04
Sulfuric acid mist	na	na	na	1.0E+00	1.00E+00	2.24E-01	1.2E+02
Toluene	na	na	na	3.0E+02	3.33E-03	7.46E-04	3.7E+04
Xylenes	na	na	na	7.0E+02	1.43E-03	3.20E-04	2.2E+04
Zinc	na	na	na	3.5E+01	2.86E-02	6.39E-03	na

1. The cancer unit risk values include the impacts from other pathways for multipathway TACs. The URV is derived from HARP for each receptor (residential and worker) and includes exposure adjustments based on the continuous operation of the source.

2. The chronic non-cancer hazard quotient for the residential is not adjusted for exposure. For the worker receptor, the chronic non-cancer hazard quotient for TACs with inhalation only pathways is adjusted for exposure (adjustment = 8/24*245/365) and no exposure adjustment is made to the hazard quotient for multipathway TACs.

3. Chemical emitted as fugitive emissions only - added Cresols, Diethanolamine, Ethylbenzene, Ethylene Dibromide, Methyl tert-Butyl Ether, Methyl Ethyl Ketone, Perchloroethylene and Propylene in January 31, 2006 submittal of TAC emission spreadsheet.

4. February 10, 2006 e-mail from Robert Johnston confirms zero emissions of beryllium, hexavalent chromium, Dibenz(a,h)anthracene, Phosphorus, Ethylene Dibromide and Methyl Ethyl Ketone. A revised TAC emission spreadsheet was submitted that included emission changes for the hydrogen plant and to add emissions of Diethanolamine, Perchloroethylene and Styrene

Source No(s)./Status
Description
Sub-Project

Toxic Air Contaminant	Residential Unit Risk Value From HARP (ug/m3)-1	Offsite Worker Unit Risk Value From HARP (ug/m3)-1	Residential HI per unit concentration HI/(ug/m3)	Offsite Worker HI per unit concentration HI/(ug/m3)	S-4170 Shutdown, F-305 A Train Reformer Furnace, Hydrogen Plant Replacement: TAC Emissions lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	2.49E-02	-7.55E+01	-1.09E-03	-3.15E-03	-6.21E-04	-1.21E-04	-2.70E-05
Ammonia @ 10 ppm slip	na	na	5.00E-03	1.12E-03	-2.22E+04	-3.19E-01			-1.59E-03	-3.56E-04
Arsenic	1.58E-02	5.18E-03	6.20E+01	5.94E+01	-4.19E+00	-6.03E-05	-9.53E-01	-3.12E-01	-3.74E-03	-3.58E-03
Benzene	2.90E-05	5.72E-06	1.67E-02	3.73E-03	-3.19E+02	-4.59E-03	-1.33E-01	-2.63E-02	-7.65E-05	-1.71E-05
Benzo(a)anthracene	1.65E-03	6.00E-04	na	na	-1.58E-01	-2.28E-06	-3.76E-03	-1.37E-03		
Benzo(a)pyrene	1.65E-02	6.00E-03	na	na	-4.42E-01	-6.36E-06	-1.05E-01	-3.81E-02		
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	na	-1.99E-01	-2.87E-06	-4.73E-03	-1.72E-03		
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	na	-1.19E-01	-1.71E-06	-2.82E-03	-1.03E-03		
Beryllium	2.43E-03	4.80E-04	1.43E+02	1.43E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds	na	na	5.88E-01	1.32E-01		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02	1.12E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	4.34E-03	8.57E-04	5.59E+01	5.49E+01	-4.87E+00	-7.01E-05	-3.04E-01	-6.01E-02	-3.92E-03	-3.85E-03
Carbon disulfide	na	na	1.25E-03	2.80E-04		0.00E+00			0.00E+00	0.00E+00
Chlorine	na	na	5.00E+00	1.12E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform	5.50E-06	1.09E-06	3.33E-03	7.46E-04		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	1.46E-01	2.91E-02	5.00E+00	5.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.65E-04	6.00E-05	na	na	-8.04E-03	-1.16E-07	-1.91E-05	-6.94E-06		
Copper (Note 5)	na	na	4.17E-01	9.32E-02	-2.08E+01	-2.99E-04			-1.24E-04	-2.78E-05
Cresols (Note 4)	na	na	1.67E-03	3.73E-04		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na	na	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01	7.46E-02		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)	na	na	5.00E-04	1.12E-04		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not	7.24E-05	1.43E-05	1.25E+00	2.80E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01	7.46E-02	-5.48E+02	-7.88E-03	-4.79E-02	-9.45E-03	-2.63E-03	-5.87E-04
n-Hexane	na	na	1.43E-04	3.20E-05		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride	na	na	1.11E-01	2.49E-02		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	na	na	1.00E-01	2.24E-02	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	na	-5.08E-01	-7.31E-06	-1.21E-02	-4.38E-03		
Lead	3.58E-05	1.44E-05	na	na	-2.41E+01	-3.47E-04	-1.24E-02	-5.00E-03		
Manganese (Note 5)	na	na	5.00E+00	1.12E+00	-3.36E+01	-4.83E-04			-2.42E-03	-5.41E-04
Mercury	na	na	5.76E+01	5.35E+01	-8.88E-01	-1.28E-05			-7.36E-04	-6.83E-04
Methanol	na	na	2.50E-04	5.59E-05		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04	2.80E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No	na	na	1.00E-03	2.24E-04		0.00E+00			0.00E+00	0.00E+00
Naphthalene	3.48E-05	6.86E-06	1.11E-01	2.49E-02	-1.54E+00	-2.22E-05	-7.73E-04	-1.52E-04	-2.47E-06	-5.52E-07
Nickel (Note 5)	2.64E-04	5.20E-05	2.00E+01	2.00E+01	-4.65E+01	-6.68E-04	-1.76E-01	-3.48E-02	-1.34E-02	-1.34E-02
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	6.39E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	na	na	5.00E-03	1.12E-03	-2.78E+01	-3.99E-04			-2.00E-06	-4.47E-07
Phosphorus	na	na	1.43E+01	3.20E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05	1.73E+05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)	na	na	3.33E-04	7.46E-05		0.00E+00			0.00E+00	0.00E+00
Selenium	na	na	5.00E-02	1.12E-02	-9.67E-02	-1.39E-06			-6.95E-06	-1.56E-08
Styrene	na	na	1.11E-03	2.49E-04		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	na	na	1.00E+00	2.24E-01	-3.97E+02	-5.71E-03			-5.71E-03	-1.28E-03
Toluene	na	na	3.33E-03	7.46E-04	-5.28E+02	-7.59E-03			-2.53E-05	-5.66E-06
Xylenes	na	na	1.43E-03	3.20E-04	-1.84E+02	-2.65E-03			-3.78E-06	-8.46E-07
Zinc (Note 5)	na	na	2.86E-02	6.39E-03	-1.03E+02	-1.48E-03			-4.22E-05	-9.43E-06
						sum	-1.76E+00	-4.95E-01	-3.45E-02	-2.43E-02

Toxic Air Contaminant	S-4171 Shutdown, F-355 B Train Reformer Furnace, Hydrogen Plant Replacement: TAC Emissions lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	S-4158 Shutdown, F-340 Feed Furnace, Hydrogen Plant Replacement: TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	-6.75E+01	-9.72E-04	-2.82E-03	-5.56E-04	-1.08E-04	-2.42E-05	-4.46E+00	-6.42E-05	-1.86E-04	-3.67E-05	-7.13E-06	-1.60E-06
Ammonia @ 10 ppm slip		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Arsenic	-3.75E+00	-5.40E-05	-8.53E-01	-2.80E-01	-3.35E-03	-3.21E-03	-2.48E-01	-3.56E-06	-5.63E-02	-1.85E-02	-2.21E-04	-2.12E-04
Benzene	-2.86E+02	-4.11E-03	-1.18E-01	-2.35E-02	-6.85E-05	-1.53E-05	-1.89E+01	-2.71E-04	-7.87E-03	-1.55E-03	-4.52E-06	-1.01E-06
Benzo(a)anthracene	-1.42E-01	-2.04E-06	-3.36E-03	-1.22E-03			-9.36E-03	-1.35E-07	-2.22E-04	-8.06E-05		
Benzo(a)pyrene	-3.96E-01	-5.69E-06	-9.39E-02	-3.41E-02			-2.61E-02	-3.76E-07	-6.20E-03	-2.25E-03		
Benzo(b)fluoranthene	-1.78E-01	-2.57E-06	-4.23E-03	-1.54E-03			-1.18E-02	-1.69E-07	-2.00E-04	-1.02E-04		
Benzo(k)fluoranthene	-1.06E-01	-1.53E-06	-2.53E-03	-9.18E-04			-7.03E-03	-1.01E-07	-1.67E-04	-6.06E-05		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	-4.36E+00	-6.27E-05	-2.72E-01	-5.38E-02	-3.51E-03	-3.44E-03	-2.08E-01	-4.14E-06	-1.80E-02	-3.55E-03	-2.32E-04	-2.27E-04
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	-7.20E-03	-1.04E-07	-1.71E-05	-6.21E-06			-4.75E-04	-6.84E-09	-1.13E-06	-4.10E-07		
Copper (Note 5)	-1.86E+01	-2.67E-04			-1.11E-04	-2.49E-05	-1.23E+00	-1.77E-05			-7.36E-06	-1.65E-06
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	-4.90E+02	-7.05E-03	-4.29E-02	-8.46E-03	-2.35E-03	-5.26E-04	-3.24E+01	-4.66E-04	-2.83E-03	-5.59E-04	-1.55E-04	-3.47E-05
n-Hexane		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	-4.55E-01	-6.54E-06	-1.08E-02	-3.92E-03			-3.00E-02	-4.32E-07	-7.13E-04	-2.59E-04		
Lead	-2.16E+01	-3.11E-04	-1.11E-02	-4.47E-03			-1.43E+00	-2.05E-05	-7.34E-04	-2.95E-04		
Manganese (Note 5)	-3.01E+01	-4.32E-04			-2.16E-03	-4.84E-04	-1.99E+00	-2.86E-05			-1.43E-04	-3.19E-05
Mercury	-7.95E-01	-1.14E-05			6.58E-04	-6.11E-04	-5.25E-02	-7.55E-07			-4.35E-05	-4.04E-05
Methanol		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	-1.38E+00	-1.99E-05	6.92E-04	-1.36E-04	-2.21E-06	-4.94E-07	-9.13E-02	-1.31E-06	-4.57E-05	-9.00E-06	-1.46E-07	-3.26E-08
Nickel (Note 5)	-4.16E+01	-5.98E-04	-1.58E-01	-3.11E-02	-1.20E-02	-1.20E-02	-2.75E+00	-3.95E-05	-1.04E-02	-2.05E-03	-7.90E-04	-7.90E-04
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	-2.49E+01	-3.57E-04			-1.79E-06	-4.00E-07	-1.64E+00	-2.36E-05			-1.18E-07	-2.64E-08
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	-8.65E-02	-1.24E-06			-6.22E-06	-1.39E-08	-5.71E-03	-8.22E-08			-4.11E-08	-9.20E-10
Styrene		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	-3.56E+02	-5.11E-03			-5.11E-03	-1.14E-03	-2.35E+01	-3.38E-04			-3.38E-04	-7.56E-05
Toluene	-4.72E+02	-6.79E-03			-2.26E-05	-5.07E-06	-3.12E+01	-4.49E-04			-1.50E-06	-3.35E-07
Xylenes	-1.65E+02	-2.37E-03			-3.38E-06	-7.57E-07	-1.09E+01	-1.56E-04			-2.23E-07	-5.00E-08
Zinc (Note 5)	-9.18E+01	-1.32E-03			-3.77E-05	-8.44E-06	-6.06E+00	-8.72E-05			-2.49E-06	-5.58E-07
		sum	-1.57E+00	-4.43E-01	-2.95E-02	2.15E-02		sum	-1.04E-01	-2.93E-02	-1.95E-03	-1.42E-03

Toxic Air Contaminant	S-4471 New, Hyd Plt Train 1 Reformer Furnace, Hydrogen Plant Replacement: TAC Emissions lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	S-4472 New, Hyd Plt Train 2 Reformer Furnace, Hydrogen Plant Replacement: TAC Emissions lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	1.23E+02	1.77E-03	5.14E-03	1.01E-03	1.97E-04	4.41E-05	1.23E+02	1.77E-03	5.14E-03	1.01E-03	1.97E-04	4.41E-05
Ammonia @ 10 ppm slip	3.62E+04	5.21E-01			2.60E-03	5.82E-04	3.62E+04	5.21E-01			2.60E-03	5.82E-04
Arsenic	6.85E+00	9.85E-05	1.56E+00	5.10E-01	6.11E-03	5.85E-03	6.85E+00	9.85E-05	1.56E+00	5.10E-01	6.11E-03	5.85E-03
Benzene	5.21E+02	7.50E-03	2.18E-01	4.29E-02	1.25E-04	2.80E-05	5.21E+02	7.50E-03	2.18E-01	4.29E-02	1.25E-04	2.80E-05
Benzo(a)anthracene	2.59E-01	3.72E-06	6.14E-03	2.23E-03			2.59E-01	3.72E-06	6.14E-03	2.23E-03		
Benzo(a)pyrene	7.22E-01	1.04E-05	1.71E-01	6.23E-02			7.22E-01	1.04E-05	1.71E-01	6.23E-02		
Benzo(b)fluoranthene	3.26E-01	4.68E-06	7.73E-03	2.81E-03			3.26E-01	4.68E-06	7.73E-03	2.81E-03		
Benzo(k)fluoranthene	1.94E-01	2.79E-06	4.61E-03	1.68E-03			1.94E-01	2.79E-06	4.61E-03	1.68E-03		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	7.96E+00	1.15E-04	4.97E-01	9.82E-02	6.40E-03	6.29E-03	7.96E+00	1.15E-04	4.97E-01	9.82E-02	6.40E-03	6.29E-03
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.31E-02	1.89E-07	3.12E-05	1.13E-05			1.31E-02	1.89E-07	3.12E-05	1.13E-05		
Copper (Note 5)	3.39E+01	4.88E-04			2.03E-04	4.55E-05	3.39E+01	4.88E-04			2.03E-04	4.55E-05
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	8.95E+02	1.29E-02	7.82E-02	1.54E-02	4.29E-03	9.60E-04	8.95E+02	1.29E-02	7.82E-02	1.54E-02	4.29E-03	9.60E-04
n-Hexane		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	8.30E-01	1.19E-05	1.97E-02	7.16E-03			8.30E-01	1.19E-05	1.97E-02	7.16E-03		
Lead	3.94E+01	5.67E-04	2.03E-02	8.16E-03			3.94E+01	5.67E-04	2.03E-02	8.16E-03		
Manganese (Note 5)	5.49E+01	7.89E-04			3.95E-03	8.83E-04	5.49E+01	7.89E-04			3.95E-03	8.83E-04
Mercury	1.45E+00	2.09E-05			1.20E-03	1.12E-03	1.45E+00	2.09E-05			1.20E-03	1.12E-03
Methanol	5.52E-01	7.95E-06			1.99E-09	4.44E-10	5.52E-01	7.95E-06			1.99E-09	4.44E-10
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	2.52E+00	3.63E-05	1.26E-03	2.49E-04	4.03E-06	9.02E-07	2.52E+00	3.63E-05	1.26E-03	2.49E-04	4.03E-06	9.02E-07
Nickel (Note 5)	7.59E+01	1.09E-03	2.88E-01	5.68E-02	2.18E-02	2.18E-02	7.59E+01	1.09E-03	2.88E-01	5.68E-02	2.18E-02	2.18E-02
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	4.54E+01	6.53E-04			3.26E-06	7.30E-07	4.54E+01	6.53E-04			3.26E-06	7.30E-07
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	1.58E-01	2.27E-06			1.14E-07	2.54E-08	1.58E-01	2.27E-06			1.14E-07	2.54E-08
Styrene		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	4.46E+02	6.42E-03			6.42E-03	1.44E-03	4.46E+02	6.42E-03			6.42E-03	1.44E-03
Toluene	8.62E+02	1.24E-02			4.13E-05	9.25E-06	8.62E+02	1.24E-02			4.13E-05	9.25E-06
Xylenes	3.01E+02	4.32E-03			6.18E-06	1.38E-06	3.01E+02	4.32E-03			6.18E-06	1.38E-06
Zinc (Note 5)	1.68E+02	2.41E-03			6.89E-05	1.54E-05	1.68E+02	2.41E-03			6.89E-05	1.54E-05
		sum	2.87E+00	8.09E-01	5.35E-02	3.91E-02		sum	2.87E+00	8.09E-01	5.35E-02	3.91E-02

Toxic Air Contaminant	S-4181, S-4182, S-4183 Modified [illegible] Hydrogen Plant Replacement: TAC Emissions lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ammonia @ 10 ppm slip		[illegible]			[illegible]	[illegible]
Arsenic	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)anthracene	[illegible]	[illegible]	[illegible]	[illegible]		
Benzo(a)pyrene	[illegible]	[illegible]	[illegible]	[illegible]		
Benzo(b)fluoranthene	[illegible]	[illegible]	[illegible]	[illegible]		
Benzo(k)fluoranthene	[illegible]	[illegible]	[illegible]	[illegible]		
Beryllium	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bromine & compounds		[illegible]			[illegible]	[illegible]
1,3-Butadiene		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cadmium (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carbon disulfide		[illegible]			[illegible]	[illegible]
Chlorine		[illegible]			[illegible]	[illegible]
Chloroform		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chromium (hexavalent)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	[illegible]	[illegible]	[illegible]	[illegible]		
Copper (Note 5)	[illegible]	[illegible]			[illegible]	[illegible]
Cresols (Note 4)		[illegible]			[illegible]	[illegible]
Dibenz(a,h)anthracene	[illegible]	[illegible]	[illegible]	[illegible]		
Diethanolamine (DEA) (Note 4)		[illegible]			[illegible]	[illegible]
Ethylbenzene (Note 4)		[illegible]			[illegible]	[illegible]
Ethylene Dibromide (EDB) (Not		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Formaldehyde	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
n-Hexane		[illegible]			[illegible]	[illegible]
Hydrogen chloride		[illegible]			[illegible]	[illegible]
Hydrogen sulfide	[illegible]	[illegible]			[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	[illegible]	[illegible]	[illegible]	[illegible]		
Lead	[illegible]	[illegible]	[illegible]	[illegible]		
Manganese (Note 5)	[illegible]	[illegible]			[illegible]	[illegible]
Mercury	[illegible]	[illegible]			[illegible]	[illegible]
Methanol		[illegible]			[illegible]	[illegible]
Methyl tert-Butyl Ether (MTBE)		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methyl Ethyl Ketone (MEK) (No		[illegible]			[illegible]	[illegible]
Naphthalene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nickel (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Perchloroethylene (Note 4)		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phenol (Note 5)	[illegible]	[illegible]			[illegible]	[illegible]
Phosphorus	[illegible]	[illegible]			[illegible]	[illegible]
Polychlorinated dioxins/furans		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Propylene (Note 4)		[illegible]			[illegible]	[illegible]
Selenium	[illegible]	[illegible]			[illegible]	[illegible]
Styrene		[illegible]			[illegible]	[illegible]
Sulfuric acid mist		[illegible]			[illegible]	[illegible]
Toluene	[illegible]	[illegible]			[illegible]	[illegible]
Xylenes	[illegible]	[illegible]			[illegible]	[illegible]
Zinc (Note 5)	[illegible]	[illegible]			[illegible]	[illegible]
		sum	0.00E+00	0.00E+00	0.00E+00	[illegible]

Multiple sources with multiple emission points in close proximity
(These sources are in close proximity and data are not available to split emissions from these sources further
Chevron recommends that these sources be combined and modeled as one source
Calculations have been done on this basis

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3550 and F-3560 both emit from 4 Rhen W stack. Total is shown in 4 Rhen W Total column
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3570 and F-3580 both emit from 4 Rhen E stack. Total is shown in 4 Rhen E Total column
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source for carbon disulfide and sulfuric acid mist. Stack heater is source for all other pollutants
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas, refinery fuel gas and LPG (for other constituents cogen fuel is natural gas and refinery fuel gas)

(1) Cancer Risk Model Input (per million) = Sum ((TAC emission, g/s) * (Unit Risk (ug/m^3)$^{-1}$) * 1E6)
(2) Chronic Hazard Index Model Input = Sum ((TAC emission g/s) * (Chronic HI / ug/m^3))

Attachment AQ-12B
Chevron Refinery Renewal Project
Combustion Source Toxic Emission Estimate

Source No(s)./Status
Description
Sub-Project

Toxic Air Contaminant	Residential Unit Risk Value From HARP (µg/m3)-1	Offsite Worker Unit Risk Value From HARP (µg/m3)-1	Residential Hi per unit concentration (µg/m3)	S-4133 Shutdown No. 1 Power Plant - 5 Boiler Power Plant Replacement						S-4135 Shutdown No. 1 Power Plant - 7 Boiler Power Plant Replacement						S-4470 & S-4471 Modified No. 1 Power Plant - Cogen 2 Power Plant Replacement						S-4473 & S-4474 New No. 1 Power Plant - Cogen 3 Power Plant Replacement						[illegible] Power Plant Replacement					
				TAC Emissions lb/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic Hi Model Input (2)	Offsite Worker Chronic Hi Model Input (2)	TAC Emissions lb/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic Hi Model Input (2)	Offsite Worker Chronic Hi Model Input (2)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	TAC Emissions lb/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic Hi Model Input (2)	Offsite Worker Chronic Hi Model Input (2)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	-1.07E+01	-1.54E-04	-4.46E-04	-8.80E-05	-1.71E-05	-3.38E-06	-1.23E+01	-1.76E-04	-5.11E-04	-1.01E-04	-1.99E-05	-4.38E-06							3.02E+01	4.33E-04	1.26E-03	2.49E-04	4.63E-05	1.06E-05				
Ammonia @ 10 ppm slip	na	na	5.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00							1.00E+05	1.44E+00			7.21E-03	1.61E-03				
Arsenic	1.58E-03	5.18E-03	6.20E+01	-5.94E-01	-8.55E-06	-1.25E-01	-4.13E-02	-5.30E-04	-5.08E-04	-6.81E-01	-9.80E-06	-1.55E-01	-5.09E-02	-6.08E-04	-5.82E-04							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Benzene	2.96E-05	5.72E-06	1.67E-02	-4.52E+01	-6.51E-04	-1.89E-02	-3.72E-03	-1.08E-05	-2.43E-06	-5.18E+01	-7.45E-04	-2.16E-02	-4.27E-03	-1.24E-05	-2.79E-06							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Benzo(a)anthracene	1.66E-03	6.00E-04	na	-2.24E-02	-3.23E-07	-5.33E-04	-1.94E-04			-2.57E-02	-3.70E-07	-6.11E-04	-2.22E-04									1.10E-01	1.58E-06	2.60E-03	9.46E-04						
Benzo(a)pyrene	1.65E-02	6.00E-03	na	-6.27E-02	9.01E-07	-1.49E-03	-5.41E-03			-7.18E-02	1.03E-06	-1.70E-03	-6.20E-03									0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	-2.83E-02	-4.08E-07	-6.70E-04	-2.44E-04			-3.24E-02	-4.66E-07	-7.68E-04	-2.79E-04									1.94E-01	2.65E-06	4.37E-03	1.58E-03						
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	-1.69E-02	-2.42E-07	-4.00E-04	-1.45E-04			-1.93E-02	-2.78E-07	-4.58E-04	-1.67E-04									0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Beryllium	2.43E-03	4.80E-04	1.43E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Bromine & compounds	na	na	5.88E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00					
Cadmium (Note 5)	4.34E-03	8.57E-04	5.56E+01	-8.91E-01	-9.24E-06	-4.31E-02	-8.52E-03	5.10E-04	-5.46E-04	-7.92E-01	-1.14E-05	-4.94E-02	-9.71E-03	-6.37E-04	-6.25E-04							2.86E+01	4.12E-04	1.72E+00	3.53E-01	2.30E-02	2.70E-02				
Carbon disulfide	na	na	1.25E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Chlorine	na	na	5.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Chloroform	5.50E-06	1.09E-06	3.33E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Chrysene	1.65E-04	6.00E-05	na	-1.14E-03	-1.64E-06	-2.71E-06	-9.84E-07			-1.31E-03	-1.88E-06	-3.10E-06	-1.13E-06									7.87E-01	1.13E-05	1.87E-03	6.79E-04						
Copper (Note 5)	na	na	4.17E-01	-2.94E+00	-4.23E-05			-1.76E-05	-3.95E-06	-3.37E+00	-4.85E-05			-2.02E-05	-4.52E-06							1.57E+02	2.29E-03			9.44E-04	2.11E-04				
Cresols (Note 4)	na	na	1.67E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Dibenzo(a,h)anthracene	6.48E-03	2.21E-03	na	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00									0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Ethylbenzene (Note 4)	na	na	5.00E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Ethylene Dibromide (EDB) (Note	2.74E-05	1.43E-05	1.25E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Formaldehyde	6.08E-06	1.20E-06	3.33E-01	-7.76E+01	-1.12E-03	-6.79E-03	-1.34E-03	-3.72E-04	-8.33E-05	-8.90E+01	-1.28E-03	-7.78E-03	-1.54E-03	-4.27E-04	-9.54E-05							1.13E+03	1.63E-02	9.91E-02	1.95E-02	1.43E-03	1.22E-03				
n-Hexane	na	na	1.43E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Hydrogen chloride	na	na	1.11E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Hydrogen sulfide	na	na	1.00E-01	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00							0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	-7.20E-02	-1.04E-06	-1.71E-03	-6.22E-04			-6.25E-02	-1.19E-06	-1.96E-03	-7.12E-04									0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Lead	3.58E-05	1.44E-05	na	-3.42E+00	-4.92E-05	-1.76E-03	7.00E-04			-3.52E+00	-5.04E-05	-2.02E-03	-8.12E-04									0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Manganese (Note 5)	na	na	5.00E+00	-4.79E+00	-6.85E-05			-3.42E-04	-7.66E-05	-5.46E+00	-7.85E-05			-3.93E-04	-8.78E-05							6.78E+02	9.75E-03			1.87E-02	1.09E-02				
Mercury	na	na	5.76E+01	-1.29E-01	-1.81E-06			-1.04E-04	-9.66E-05	-1.44E-01	-2.07E-06			-1.20E-04	-1.11E-04							3.20E+01	4.60E-04			2.69E-02	2.46E-02				
Methanol	na	na	2.50E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.02E-07	1.25E-04		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Methyl Ethyl Ketone (MEK) (No	na	na	1.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Naphthalene	3.48E-05	6.86E-06	1.11E-01	-2.18E-01	-3.15E-06	-1.10E-04	-2.18E-05	-3.50E-07	-7.83E-08	-2.51E-01	-3.61E-06	-1.26E-04	-2.48E-05	-4.01E-07	-8.97E-08							2.75E+02	3.96E-03	1.38E-01	2.72E-02	4.40E-04	9.84E-05				
Nickel (Note 5)	2.64E-04	5.20E-05	2.00E+01	-6.58E+00	-9.47E-05	-2.50E-02	-4.93E-03	1.80E-03	-1.89E-03	-7.55E+00	-1.09E-04	-2.87E-02	-5.65E-03	-2.17E-03	-2.17E-03							1.07E+03	1.52E-07	4.08E+00	8.04E-01	3.09E-01	3.08E-01				
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Phenol (Note 5)	na	na	5.00E-03	-3.94E+00	-5.66E-05			-2.83E-07	-6.34E-08	-4.51E+00	-6.49E-05			-2.25E-07	-7.26E-08							2.24E+02	3.23E-03			1.61E-05	3.61E-06				
Phosphorus	na	na	1.43E+01	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00							0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00								0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Propylene (Note 4)	na	na	3.33E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Selenium	na	na	5.00E-02	-1.37E-02	-1.97E-07			-9.86E-09	-2.21E-09	-1.57E-02	-2.26E-07			-1.13E-08	-2.53E-09							0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Styrene	na	na	1.11E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00								0.00E+00			0.00E+00	0.00E+00				
Sulfuric acid mist	na	na	1.00E+00	-5.63E+01	-8.10E-04			-8.10E-04	-1.81E-04	-6.46E+01	-9.28E-04			-9.28E-04	-2.08E-04							1.72E+04	2.48E-01			2.48E-01	5.55E-02				
Toluene	na	na	3.33E-03	-7.48E+01	-1.08E-03			-3.59E-06	-8.03E-07	-8.58E+01	-1.23E-03			-4.11E-06	-9.20E-07							0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Xylenes	na	na	1.43E-03	-2.61E+01	-3.75E-04			-5.36E-07	-1.20E-07	-2.99E+01	-4.30E-04			-6.14E-07	-1.37E-07							0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Zinc (Note 5)	na	na	2.86E-02	-1.45E+01	-2.09E-04			-5.98E-06	-1.34E-06	-1.67E+01	-2.40E-04			-6.85E-06	-1.53E-06							1.59E+03	2.29E-02			6.53E-04	1.46E-04				
				Sum		-2.49E-01	-7.02E-02	-4.67E-02	-3.40E-03	Sum		2.86E-01	-8.05E-02	-5.35E-02	-3.90E-03	Sum		6.11E+00	1.21E+00	6.70E-01	4.25E-01						

Multiple sources with multiple emission points in close proximity
(These sources are in close proximity and data are not available to total emissic
Chevron recommends that these sources be combined and modeled as one so
Calculations have been done on this basis

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the
Note 3: Each SRU and its associated stack heater emit from a common point.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gi

(1) Cancer Risk Model Input (per million) = Sum ((TAC emission, g/s) * (Un
(2) Chronic Hazard Index Model Input = Sum ((TAC emission, g/s) * (Chron

Attachment AQ-12B
Chevron Refinery Renewal Project
Combustion Source Toxic Emission Estimate

Source No(s)./Status / Description / Sub-Project				[illegible]	[illegible]	[illegible]	S-4038 & S4039 Shutdown Note 1 4 Rhen W (F-3550 & F-3560) Total Reformer Replacement						[illegible]	[illegible]
Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)	[illegible]	[illegible]	[illegible]	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	[illegible]	[illegible]
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	[illegible]	[illegible]	[illegible]	-2.61E+01	-3.75E-04	-1.09E-03	-2.15E-04	-4.17E-05	-9.33E-06	[illegible]	[illegible]
Ammonia @ 10 ppm slip	na	na	5.00E-03	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Arsenic	1.58E-02	5.18E-03	6.20E+01	[illegible]	[illegible]	[illegible]	-1.45E+00	-2.09E-05	-3.30E-01	-1.08E-01	-1.29E-03	-1.24E-03	[illegible]	[illegible]
Benzene	2.90E-05	5.72E-06	1.67E-02	[illegible]	[illegible]	[illegible]	-1.10E+02	-1.59E-03	-4.60E-02	-9.08E-03	-2.65E-05	-5.92E-06	[illegible]	[illegible]
Benzo(a)anthracene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	-5.48E-02	-7.88E-07	-1.30E-03	-4.73E-04			[illegible]	[illegible]
Benzo(a)pyrene	1.65E-02	6.00E-03	na	[illegible]	[illegible]	[illegible]	-1.53E-01	-2.20E-06	-3.63E-02	-1.32E-02			[illegible]	[illegible]
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	-6.89E-02	-9.91E-07	-1.64E-03	-5.95E-04			[illegible]	[illegible]
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	-4.11E-02	-5.91E-07	-9.76E-04	-3.55E-04			[illegible]	[illegible]
Beryllium	2.43E-03	4.80E-04	1.43E+02	[illegible]	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Bromine & compounds	na	na	5.88E-01	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02	[illegible]	[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Cadmium (Note 5)	4.34E-03	8.57E-04	5.59E+01	[illegible]	[illegible]	[illegible]	-1.69E+00	-2.42E-05	-1.05E-01	-2.08E-02	-1.36E-03	-1.33E-03	[illegible]	[illegible]
Carbon disulfide	na	na	1.25E-03	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Chlorine	na	na	5.00E+00	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Chloroform	5.58E-06	1.09E-06	3.33E-03	[illegible]	[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00	[illegible]	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Chrysene	1.65E-04	6.00E-05	na	[illegible]	[illegible]	[illegible]	-2.78E-03	-4.00E-08	-6.60E-06	-2.40E-06			[illegible]	[illegible]
Copper (Note 5)	na	na	4.17E-01	[illegible]	[illegible]	[illegible]	-7.18E+00	-1.03E-04			-4.30E-05	-9.63E-06	[illegible]	[illegible]
Cresols (Note 4)	na	na	1.67E-03	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na	[illegible]	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00	0.00E+00			[illegible]	[illegible]
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Ethylbenzene (Note 4)	na	na	5.00E-04	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Ethylene Dibromide (EDB) (No	7.24E-05	1.43E-05	1.25E+00	[illegible]	[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Formaldehyde	6.08E-06	1.20E-06	3.33E-01	[illegible]	[illegible]	[illegible]	-1.89E+02	-2.72E-03	-1.66E-02	-3.27E-03	-9.08E-04	-2.03E-04	[illegible]	[illegible]
n-Hexane	na	na	1.43E-04	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Hydrogen chloride	na	na	1.11E-01	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Hydrogen sulfide	na	na	1.00E-01	[illegible]	[illegible]	[illegible]	0.00E+00	0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	-1.76E-01	-2.53E-06	-4.17E-03	-1.52E-03			[illegible]	[illegible]
Lead	3.58E-05	1.44E-05	na	[illegible]	[illegible]	[illegible]	-8.34E+00	-1.20E-04	-4.30E-03	-1.73E-03			[illegible]	[illegible]
Manganese (Note 5)	na	na	5.00E+00	[illegible]	[illegible]	[illegible]	-1.16E+01	-1.67E-04			-8.35E-04	-1.87E-04	[illegible]	[illegible]
Mercury	na	na	5.76E+01	[illegible]	[illegible]	[illegible]	-3.07E-01	-4.42E-06			-2.54E-04	-2.36E-04	[illegible]	[illegible]
Methanol	na	na	2.50E-04	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04	[illegible]	[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Methyl Ethyl Ketone (MEK) (No	na	na	1.00E-03	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Naphthalene	3.48E-05	6.86E-06	1.11E-01	[illegible]	[illegible]	[illegible]	-5.34E-01	-7.68E-06	-2.67E-04	-5.27E-05	-8.53E-07	-1.91E-07	[illegible]	[illegible]
Nickel (Note 5)	2.64E-04	5.20E-05	2.00E+01	[illegible]	[illegible]	[illegible]	-1.61E+01	-2.31E-04	-6.10E-02	-1.20E-02	-4.62E-03	-4.62E-03	[illegible]	[illegible]
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	[illegible]	[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Phenol (Note 5)	na	na	5.00E-03	[illegible]	[illegible]	[illegible]	-9.60E+00	-1.38E-04			-6.91E-07	-1.55E-07	[illegible]	[illegible]
Phosphorus	na	na	1.43E+01	[illegible]	[illegible]	[illegible]	0.00E+00	0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05	[illegible]	[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	[illegible]	[illegible]
Propylene (Note 4)	na	na	3.33E-04	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Selenium	na	na	5.00E-02	[illegible]	[illegible]	[illegible]	-3.34E-02	-4.81E-07			-2.40E-08	-5.38E-09	[illegible]	[illegible]
Styrene	na	na	1.11E-03	[illegible]	[illegible]	[illegible]		0.00E+00			0.00E+00	0.00E+00	[illegible]	[illegible]
Sulfuric acid mist	na	na	1.00E+00	[illegible]	[illegible]	[illegible]	-1.37E+02	-1.98E-03			-1.98E-03	-4.42E-04	[illegible]	[illegible]
Toluene	na	na	3.33E-03	[illegible]	[illegible]	[illegible]	-1.83E+02	-2.63E-03			-6.75E-06	-1.96E-06	[illegible]	[illegible]
Xylenes	na	na	1.43E-03	[illegible]	[illegible]	[illegible]	-6.36E+01	-9.15E-04			-1.31E-06	-2.93E-07	[illegible]	[illegible]
Zinc (Note 5)	na	na	2.86E-02	[illegible]	[illegible]	[illegible]	-3.55E+01	-5.10E-04			-1.46E-05	-3.26E-06	[illegible]	[illegible]
				[illegible]	[illegible]	[illegible]		sum	-6.08E-01	-1.71E-01	-1.14E-02	-8.29E-03	[illegible]	[illegible]

Multiple sources with multiple emission points in close proximity
(These sources are in close proximity and data are not available to split emissi
Chevron recommends that these sources be combined and modeled as one so
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the
Note 3. Each SRU and its associated stack heater emit from a common point
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural g

(1) Cancer Risk Model Input (per million) = Sum [(TAC emission g/s) * (Un
(2) Chronic Hazard Index Model Input = Sum ((TAC emission g/s) * (Chron

Attachment AQ-12B
Chevron Refinery Renewal Project
Combustion Source Toxic Emission Estimate

Source No(s)./Status / Description / Sub-Project				[illegible]					
Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ammonia @ 10 ppm slip	na	na	5.00E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arsenic	1.58E-02	5.18E-03	6.20E+01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzene	2.90E-05	5.72E-06	1.67E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)anthracene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)pyrene	1.65E-02	6.00E-03	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Beryllium	2.43E-03	4.80E-04	1.43E+02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bromine & compounds	na	na	5.88E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cadmium (Note 5)	4.34E-03	8.57E-04	5.59E+01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carbon disulfide	na	na	1.25E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chlorine	na	na	5.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chloroform	5.50E-06	1.09E-06	3.33E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	1.65E-04	6.00E-05	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Copper (Note 5)	na	na	4.17E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cresols (Note 4)	na	na	1.67E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ethylbenzene (Note 4)	na	na	5.00E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ethylene Dibromide (EDB) (No	7.24E-05	1.43E-05	1.25E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Formaldehyde	6.08E-06	1.20E-06	3.33E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
n-Hexane	na	na	1.43E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen chloride	na	na	1.11E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen sulfide	na	na	1.00E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lead	3.58E-05	1.44E-05	na	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Manganese (Note 5)	na	na	5.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mercury	na	na	5.76E+01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methanol	na	na	2.50E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methyl Ethyl Ketone (MEK) (No	na	na	1.00E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Naphthalene	3.48E-05	6.86E-06	1.11E-01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nickel (Note 5)	2.64E-04	5.20E-05	2.00E+01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phenol (Note 5)	na	na	5.00E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phosphorus	na	na	1.43E+01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Propylene (Note 4)	na	na	3.33E-04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Selenium	na	na	5.00E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Styrene	na	na	1.11E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sulfuric acid mist	na	na	1.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Toluene	na	na	3.33E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Xylenes	na	na	1.43E-03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Zinc (Note 5)	na	na	2.86E-02	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
					sum	[illegible]	[illegible]	[illegible]	[illegible]

	S-4040 & S4041 Shutdown Note 2 4 Rhen E (F-3570 & F-3580) Total Reformer Replacement						S-4044 & S-4045 Shutdown 5 Rhen E Furnaces F-570 & F-580 Reformer Replacement					
Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model input (per million) (1)	Offsite Worker Cancer Risk Model input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model input (per million) (1)	Offsite Worker Cancer Risk Model input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	-1.10E+01	-1.58E-04	-4.58E-04	-9.03E-05	-1.75E-05	-3.93E-06	-1.53E+01	-2.21E-04	-6.39E-04	-1.26E-04	-2.45E-05	-5.48E-06
Ammonia @ 10 ppm slip		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Arsenic	-6.10E-01	-8.77E-06	-1.39E-01	-4.54E-02	-5.44E-04	-5.21E-04	-8.52E-01	-1.23E-05	-1.94E-01	-6.35E-02	-7.60E-04	-7.28E-04
Benzene	-4.64E+01	-6.68E-04	-1.94E-02	-3.82E-03	-1.11E-05	-2.49E-06	-6.48E+01	-9.32E-04	-2.70E-02	-5.33E-03	-1.55E-05	-3.48E-06
Benzo(a)anthracene	-2.30E-02	-3.31E-07	-5.47E-04	-1.99E-04			-3.22E-02	-4.63E-07	-7.63E-04	-2.78E-04		
Benzo(a)pyrene	-6.43E-02	-9.25E-07	-1.53E-02	-5.55E-03			-8.98E-02	-1.29E-06	-2.13E-02	-7.75E-03		
Benzo(b)fluoranthene	-2.90E-02	-4.17E-07	-6.88E-04	-2.50E-04			-4.05E-02	-5.82E-07	-9.61E-04	-3.49E-04		
Benzo(k)fluoranthene	-1.73E-02	-2.49E-07	-4.10E-04	-1.49E-04			-2.41E-02	-3.47E-07	-5.73E-04	-2.08E-04		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	-7.09E-01	-1.02E-05	-4.42E-02	-6.74E-03	-5.70E-04	-5.60E-04	-9.90E-01	-1.42E-05	-6.18E-02	-1.22E-02	-7.96E-04	-7.82E-04
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	-1.17E-03	-1.68E-08	-2.78E-06	-1.01E-06			-1.63E-03	-2.35E-08	-3.88E-06	-1.41E-06		
Copper (Note 5)	-3.02E+00	-4.34E-05			-1.81E-05	-4.05E-06	-4.22E+00	-6.07E-05			-2.53E-05	-5.66E-06
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (No		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	-7.96E+01	-1.15E-03	-6.96E-03	-1.37E-03	-3.82E-04	-8.54E-05	-1.11E+02	-1.60E-03	-9.73E-03	-1.92E-03	-5.33E-04	-1.19E-04
n-Hexane		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	-7.39E-02	-1.06E-06	-1.75E-03	-6.38E-04			1.03E-01	-1.48E-06	-2.45E-03	-8.91E-04		
Lead	-3.51E+00	-5.05E-05	-1.81E-03	-7.27E-04			-4.90E+00	-7.05E-05	-2.52E-03	-1.01E-03		
Manganese (Note 5)	-4.89E+00	-7.03E-05			-3.51E-04	-7.86E-05	-6.82E+00	-9.81E-05			-4.91E-04	-1.10E-04
Mercury	-1.29E-01	-1.86E-06			-1.07E-04	-9.94E-05	-1.80E-01	-2.59E-06			-1.49E-04	-1.39E-04
Methanol		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	-2.25E-01	-3.23E-06	-1.12E-04	-2.22E-05	-3.59E-07	-8.03E-08	-3.14E-01	-4.51E-06	-1.57E-04	-3.09E-05	-5.01E-07	-1.12E-07
Nickel (Note 5)	-6.76E+00	-9.72E-05	-2.57E-02	-5.05E-03	-1.94E-03	-1.94E-03	-9.44E+00	-1.36E-04	-3.58E-02	-7.06E-03	-2.72E-03	-2.72E-03
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	-4.04E+00	-5.81E-05			-2.90E-07	-6.50E-08	-5.64E+00	-8.11E-05			-4.06E-07	-9.08E-08
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	-1.41E-02	-2.03E-07			-1.01E-08	-2.26E-09	-1.96E-02	-2.82E-07			-1.41E-08	-3.16E-09
Styrene		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	-5.78E+01	-8.31E-04			-8.31E-04	-1.86E-04	-8.07E+01	-1.16E-03			-1.16E-03	-2.60E-04
Toluene	-7.68E+01	-1.10E-03			-3.68E-06	-8.24E-07	-1.07E+02	-1.54E-03			-5.14E-06	-1.15E-06
Xylenes	-2.68E+01	-3.85E-04			-5.50E-07	-1.23E-07	-3.74E+01	-5.38E-04			-7.68E-07	-1.72E-07
Zinc (Note 5)	-1.49E+01	-2.15E-04			-6.13E-06	-1.37E-06	-2.08E+01	-3.00E-04			-8.56E-06	-1.92E-06
		sum	-2.56E-01	-7.20E-02	-4.79E-03	-3.49E-03		sum	-3.57E-01	-1.01E-01	-6.69E-03	-4.87E-03

	S-4042 & S-4043 Shutdown 5 Rhen W Furnaces F-550 & F-560 Reformer Replacement						S-4477, S-4478, S-4479 & S-4480 New CCR Furnaces Reformer Replacement					
Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model input (per million) (1)	Offsite Worker Cancer Risk Model input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	-1.53E+01	-2.21E-04	-6.39E-04	-1.26E-04	-2.45E-05	-5.48E-06	6.70E+01	9.64E-04	2.80E-03	5.51E-04	1.07E-04	2.40E-05
Ammonia @ 10 ppm slip		0.00E+00			0.00E+00	0.00E+00	1.97E+04	2.83E-01			1.41E-03	3.16E-04
Arsenic	-8.52E-01	-1.23E-05	-1.94E-01	-6.35E-02	-7.60E-04	-7.28E-04	3.72E+00	5.36E-05	8.46E-01	2.77E-01	3.32E-03	3.18E-03
Benzene	-6.48E+01	-9.32E-04	-2.70E-02	-5.33E-03	-1.55E-05	-3.48E-06	2.83E+02	4.08E-03	1.18E-01	2.33E-02	6.79E-05	1.52E-05
Benzo(a)anthracene	-3.22E-02	-4.63E-07	-7.63E-04	-2.78E-04			1.41E-01	2.02E-06	3.34E-03	1.21E-03		
Benzo(a)pyrene	-8.98E-02	-1.29E-06	-2.13E-02	-7.75E-03			3.92E-01	5.64E-06	9.31E-02	3.39E-02		
Benzo(b)fluoranthene	-4.05E-02	-5.82E-07	-9.61E-04	-3.49E-04			1.77E-01	2.55E-06	4.20E-03	1.53E-03		
Benzo(k)fluoranthene	-2.41E-02	-3.47E-07	-5.73E-04	-2.08E-04			1.06E-01	1.52E-06	2.51E-03	9.11E-04		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	-9.90E-01	-1.42E-05	-6.18E-02	-1.22E-02	-7.96E-04	-7.82E-04	4.33E+00	6.22E-05	2.70E-01	5.33E-02	3.48E-03	3.42E-03
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	-1.63E-03	-2.35E-08	-3.88E-06	-1.41E-06			7.14E-03	1.03E-07	1.69E-05	6.16E-06		
Copper (Note 5)	-4.22E+00	-6.07E-05			-2.53E-05	-5.66E-06	1.84E+01	2.65E-04			1.11E-04	2.47E-05
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (No		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	-1.11E+02	-1.60E-03	-9.73E-03	-1.92E-03	-5.33E-04	-1.19E-04	4.86E+02	6.99E-03	4.25E-02	8.39E-03	2.33E-03	5.22E-04
n-Hexane		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	-1.03E-01	-1.48E-06	-2.45E-03	-8.91E-04			4.51E-01	6.49E-06	1.07E-02	3.89E-03		
Lead	-4.90E+00	-7.05E-05	-2.52E-03	-1.01E-03			2.14E+01	3.08E-04	1.10E-02	4.44E-03		
Manganese (Note 5)	-6.82E+00	-9.81E-05			-4.91E-04	-1.10E-04	2.98E+01	4.29E-04			2.15E-03	4.80E-04
Mercury	-1.80E-01	-2.59E-06			-1.49E-04	-1.39E-04	7.88E-01	1.13E-05			6.53E-04	6.07E-04
Methanol		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	-3.14E-01	-4.51E-06	-1.57E-04	-3.09E-05	-5.01E-07	-1.12E-07	1.37E+00	1.97E-05	6.86E-04	1.35E-04	2.19E-06	4.90E-07
Nickel (Note 5)	-9.44E+00	-1.36E-04	-3.58E-02	-7.06E-03	-2.72E-03	-2.72E-03	4.13E+01	5.93E-04	1.57E-01	3.09E-02	1.19E-02	1.19E-02
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	-5.64E+00	-8.11E-05			-4.06E-07	-9.08E-08	2.47E+01	3.55E-04			1.77E-06	3.97E-07
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	-1.96E-02	-2.82E-07			-1.41E-08	-3.16E-09	8.58E-02	1.23E-06			6.17E-08	1.38E-08
Styrene		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	-8.07E+01	-1.16E-03			-1.16E-03	-2.60E-04	8.05E+02	1.16E-02			1.16E-02	2.59E-03
Toluene	-1.07E+02	-1.54E-02			-5.14E-06	-1.15E-06	4.69E+02	6.74E-03			2.25E-05	5.03E-06
Xylenes	-3.74E+01	-5.38E-04			-7.68E-07	-1.72E-07	1.63E+02	2.35E-03			3.36E-06	7.51E-07
Zinc (Note 5)	-2.08E+01	-3.00E-04			-8.56E-06	-1.92E-06	9.11E+01	1.31E-03			3.74E-05	8.38E-06
		sum	-3.57E-01	-1.01E-01	-6.69E-03	-4.87E-03		sum	1.56E+00	4.40E-01	3.71E-02	2.31E-02

	[illegible]					
Toxic Air Contaminant	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Acetaldehyde	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ammonia @ 10 ppm slip	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Arsenic	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)anthracene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)pyrene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(b)fluoranthene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Benzo(k)fluoranthene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Beryllium	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Bromine & compounds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,3-Butadiene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cadmium (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carbon disulfide	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chlorine	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chloroform	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chromium (hexavalent)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Copper (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cresols (Note 4)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dibenz(a,h)anthracene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Diethanolamine (DEA) (Note 4)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ethylbenzene (Note 4)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ethylene Dibromide (EDB) (No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Formaldehyde	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
n-Hexane	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen chloride	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen sulfide	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lead	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Manganese (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mercury	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methanol	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methyl tert-Butyl Ether (MTBE)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Methyl Ethyl Ketone (MEK) (No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Naphthalene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nickel (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Perchloroethylene (Note 4)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phenol (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Phosphorus	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Polychlorinated dioxins/furans	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Propylene (Note 4)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Selenium	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Styrene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sulfuric acid mist	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Toluene	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Xylenes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Zinc (Note 5)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Multiple sources with multiple emission points in close proximity
(These sources are in close proximity and data are not available to split emissio
Chevron recommends that these sources be combined and modeled as one so
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the
Note 3: Each SRU and its associated stack heater emit from a common point
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural g

(1) Cancer Risk Model Input (per million) = Sum ((TAC emission, g/s) * (Un
(2) Chronic Hazard Index Model Input = Sum ((TAC emission, g/s) * (Chron

Attachment AQ-12B
Chevron Refinery Renewal Project
Combustion Source Toxic Emission Estimate

Source No(s)./Status
Description
Sub-Project

Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01
Ammonia @ 10 ppm slip	na	na	5.00E-03
Arsenic	1.58E-02	5.18E-03	6.20E+01
Benzene	2.90E-05	5.72E-06	1.67E-02
Benzo(a)anthracene	1.65E-03	6.00E-04	na
Benzo(a)pyrene	1.65E-02	6.00E-03	na
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na
Beryllium	2.43E-03	4.80E-04	1.43E+02
Bromine & compounds	na	na	5.88E-01
1 3-Butadiene	1.74E-04	3.43E-05	5.00E-02
Cadmium (Note 5)	4.34E-03	8.57E-04	5.59E+01
Carbon disulfide	na	na	1.25E-03
Chlorine	na	na	5.00E+00
Chloroform	5.50E-06	1.09E-06	3.33E-03
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00
Chrysene	1.65E-04	6.00E-05	na
Copper (Note 5)	na	na	4.17E-01
Cresols (Note 4)	na	na	1.67E-03
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01
Ethylbenzene (Note 4)	na	na	5.00E-04
Ethylene Dibromide (EDB) (Not	7.24E-05	1.43E-05	1.25E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01
n-Hexane	na	na	1.43E-04
Hydrogen chloride	na	na	1.11E-01
Hydrogen sulfide	na	na	1.00E-01
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na
Lead	3.58E-05	1.44E-05	na
Manganese (Note 5)	na	na	5.00E+00
Mercury	na	na	5.76E+01
Methanol	na	na	2.50E-04
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04
Methyl Ethyl Ketone (MEK) (No	na	na	1.00E-03
Naphthalene	3.48E-05	6.86E-06	1.11E-01
Nickel (Note 5)	2.64E-04	5.20E-05	2.00E+01
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02
Phenol (Note 5)	na	na	5.00E-03
Phosphorus	na	na	1.43E+01
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05
Propylene (Note 4)	na	na	3.33E-04
Selenium	na	na	5.00E-02
Styrene	na	na	1.11E-03
Sulfuric acid mist	na	na	1.00E+00
Toluene	na	na	3.33E-03
Xylenes	na	na	1.43E-03
Zinc (Note 5)	na	na	2.86E-02

Shaded block (S-4167 Modified …, Hydrogen Purity): [illegible]

Toxic Air Contaminant	S-4227 & S-4192 Modified Note 3, 1 SRU & Stack Heater, Hydrogen Purity: TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) [1]	Offsite Worker Cancer Risk Model Input (per million) [1]	Residential Chronic HI Model Input [2]	Offsite Worker Chronic HI Model Input [2]
Acetaldehyde	3.49E+00	5.01E-05	1.45E-04	2.87E-05	5.57E-06	1.25E-06
Ammonia @ 10 ppm slip		0.00E+00			0.00E+00	0.00E+00
Arsenic	1.94E-01	2.79E-06	4.40E-02	1.44E-02	1.73E-04	1.65E-04
Benzene	1.47E+01	2.12E-04	6.15E-03	1.21E-03	3.53E-06	7.91E-07
Benzo(a)anthracene	7.31E-03	1.05E-07	1.74E-04	6.31E-06		
Benzo(a)pyrene	2.04E-02	2.94E-07	4.85E-03	1.76E-03		
Benzo(b)fluoranthene	9.21E-03	1.32E-07	2.18E-04	7.94E-05		
Benzo(k)fluoranthene	5.49E-03	7.90E-08	1.30E-04	4.74E-05		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1 3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	2.25E-01	3.24E-06	1.41E-02	2.77E-03	1.81E-04	1.78E-04
Carbon disulfide	3.11E+02	4.47E-03			5.59E-06	1.25E-06
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	3.71E-04	5.34E-09	8.81E-07	3.21E-07		
Copper (Note 5)	9.59E-01	1.38E-05			5.75E-06	1.29E-06
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	2.53E+01	3.64E-04	2.21E-03	4.37E-04	1.21E-04	2.71E-05
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	2.35E-02	3.38E-07	5.57E-04	2.03E-04		
Lead	1.11E+00	1.60E-05	5.74E-04	2.31E-04		
Manganese (Note 5)	1.55E+00	2.23E-05			1.12E-04	2.50E-05
Mercury	4.10E-02	5.90E-07			3.40E-05	3.16E-05
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00
Naphthalene	7.13E-02	1.03E-06	3.57E-05	7.04E-06	1.14E-07	2.55E-08
Nickel (Note 5)	2.15E+00	3.09E-06	8.15E-03	1.61E-03	6.17E-04	6.17E-04
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	1.28E+00	1.85E-05			9.23E-08	2.06E-08
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium	4.47E-03	6.42E-08			3.21E-09	7.19E-10
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	-1.17E+04	-1.68E-01			-1.66E-01	-3.75E-02
Toluene	2.44E+01	3.51E-04			1.17E-06	2.62E-07
Xylenes	8.50E+00	1.22E-04			1.75E-07	3.91E-08
Zinc (Note 5)	4.74E+00	6.82E-05			1.95E-06	4.36E-07
		sum	8.13E-02	7.29E-02	-1.66E-01	-3.65E-02

Toxic Air Contaminant	S-4228 & S-4193 Modified Note 3, 2 SRU & Stack Heater, Hydrogen Purity: TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) [1]	Offsite Worker Cancer Risk Model Input (per million) [1]	Residential Chronic HI Model Input [2]	Offsite Worker Chronic HI Model Input [2]
Acetaldehyde	3.30E+00	4.75E-05	1.38E-04	2.72E-05	5.27E-06	1.18E-06
Ammonia @ 10 ppm slip		0.00E+00			0.00E+00	0.00E+00
Arsenic	1.83E-01	2.64E-06	4.17E-03	1.37E-02	1.64E-04	1.57E-04
Benzene	1.40E+01	2.01E-04	5.82E-03	1.15E-03	3.35E-06	7.49E-07
Benzo(a)anthracene	6.92E-03	9.96E-08	1.64E-04	5.98E-05		
Benzo(a)pyrene	1.93E-02	2.78E-07	4.59E-03	1.67E-03		
Benzo(b)fluoranthene	8.71E-03	1.25E-07	2.07E-04	7.52E-05		
Benzo(k)fluoranthene	5.20E-03	7.48E-08	1.23E-04	4.49E-05		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1 3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	2.13E-01	3.07E-06	1.33E-02	2.63E-03	1.71E-04	1.68E-04
Carbon disulfide	1.19E+02	1.71E-03			2.14E-06	4.78E-07
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	3.52E-04	5.06E-09	8.34E-07	3.03E-07		
Copper (Note 5)	9.08E-01	1.31E-05			5.44E-06	1.22E-06
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	2.39E+01	3.44E-04	2.09E-03	4.13E-04	1.15E-04	2.57E-05
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	2.22E-02	3.20E-07	5.27E-04	1.92E-04		
Lead	1.05E+00	1.52E-06	5.43E-04	2.16E-04		
Manganese (Note 5)	1.47E+00	2.11E-05			1.05E-04	2.36E-05
Mercury	3.88E-02	5.58E-07			3.22E-05	2.99E-05
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00
Naphthalene	6.75E-02	9.71E-07	3.38E-05	6.66E-06	1.08E-07	2.41E-08
Nickel (Note 5)	2.03E+00	2.92E-05	7.72E-03	1.52E-03	5.85E-04	5.85E-04
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	1.21E+00	1.75E-05			8.73E-08	1.95E-08
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium	4.23E-03	6.08E-08			3.04E-09	6.80E-10
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	-1.03E+04	-1.47E-01			-1.47E-01	-3.30E-02
Toluene	2.31E+01	3.32E-04			1.11E-06	2.48E-07
Xylenes	8.05E+00	1.16E-04			1.65E-07	3.70E-08
Zinc (Note 5)	4.49E+00	6.45E-05			1.84E-06	4.13E-07
		sum	7.69E-02	2.17E-02	-1.46E-01	-3.20E-02

Toxic Air Contaminant	S-4229 & S-4194 Modified Note 3, 3 SRU & Stack Heater, Hydrogen Purity: TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) [1]	Offsite Worker Cancer Risk Model Input (per million) [1]	Residential Chronic HI Model Input [2]	Offsite Worker Chronic HI Model Input [2]
Acetaldehyde	6.41E+00	9.23E-05	2.68E-04	5.28E-05	1.03E-05	2.29E-06
Ammonia @ 10 ppm slip		0.00E+00			0.00E+00	0.00E+00
Arsenic	3.56E-01	5.13E-06	8.10E-02	2.66E-02	3.18E-04	3.04E-04
Benzene	2.71E+01	3.90E-04	1.13E-02	2.23E-03	6.50E-06	1.45E-06
Benzo(a)anthracene	1.35E-02	1.94E-07	3.19E-04	1.16E-04		
Benzo(a)pyrene	3.78E-02	5.40E-07	8.92E-03	3.24E-03		
Benzo(b)fluoranthene	1.69E-02	2.44E-07	4.02E-04	1.46E-04		
Benzo(k)fluoranthene	1.01E-02	1.45E-07	2.40E-04	8.72E-05		
Beryllium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1 3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Note 5)	4.14E-01	5.96E-09	2.59E-02	5.11E-03	3.33E-04	3.27E-04
Carbon disulfide	4.74E+02	6.81E-03			8.52E-06	1.91E-06
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	6.83E-04	9.83E-09	1.62E-06	5.90E-07		
Copper (Note 5)	1.77E+00	2.54E-05			1.06E-05	2.37E-06
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	4.65E+01	6.69E-04	4.07E-03	8.03E-04	2.23E-04	4.99E-05
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	4.32E-02	6.21E-07	1.02E-03	3.73E-04		
Lead	2.05E+00	2.95E-05	1.06E-03	4.25E-04		
Manganese (Note 5)	2.86E+00	4.11E-05			2.05E-04	4.59E-05
Mercury	7.55E-02	1.09E-06			6.25E-05	5.81E-05
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (No		0.00E+00			0.00E+00	0.00E+00
Naphthalene	1.31E-01	1.89E-06	6.57E-05	1.29E-05	2.10E-07	4.69E-08
Nickel (Note 5)	3.95E+00	5.68E-05	1.50E-02	2.95E-03	1.14E-03	1.14E-03
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol (Note 5)	2.36E+00	3.40E-05			1.70E-07	3.80E-08
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium	8.22E-03	1.18E-07			5.91E-09	1.32E-09
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	-1.54E+04	-2.22E-01			-2.22E-01	-4.96E-02
Toluene	4.49E+01	6.45E-04			2.15E-06	4.81E-07
Xylenes	1.56E+01	2.25E-04			3.21E-07	7.19E-08
Zinc (Note 5)	8.72E+00	1.25E-04			3.58E-06	8.02E-07
		sum	1.50E-01	4.21E-02	-2.19E-01	-4.77E-02

Shaded block (Existing …): [illegible]

Multiple sources with multiple emission points in close proximity
(These sources are in close proximity and data are not available to split emissic
Chevron recommends that these sources be combined and modeled as one so
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the
Note 3: Each SRU and its associated stack heater emit from a common point.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural g

(1) Cancer Risk Model Input (per million) = Sum { (TAC emission, g/s) * (Un
(2) Chronic Hazard index Model Input = Sum { (TAC emission, g/s) * (Chron

Attachment AQ-12B
Chevron Refinery Renewal Project
Annual Point Non-Combustion Toxic Emissions

Source No(s)./Status Description Sub-Project					S-4465 New Hyd Pit Cooling Tower						S-4283 Shutdown 4 Rhen Regen Vent						S-4237 Shutdown 5 Rhen Regen Vent					
Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential Hi per unit concentration, Hi/(ug/m3)	Offsite Worker Hi per unit concentration, Hi/(ug/m3)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic Hi Model Input (2)	Offsite Worker Chronic Hi Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic Hi Model Input (2)	Offsite Worker Chronic Hi Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic Hi Model Input (2)	Offsite Worker Chronic Hi Model Input (2)
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	2.49E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	na	na	5.00E-03	1.12E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Arsenic	1.58E-02	5.18E-03	6.20E+01	5.94E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	2.90E-05	5.72E-06	1.67E-02	3.73E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.34E+00	-9.12E-05	-2.64E-03	-5.22E-04	-1.52E-06	-3.40E-07	-6.78E+00	-9.75E-05	-2.83E-03	-5.58E-04	-1.62E-06	-3.64E-07
Benzo(a)anthracene	1.65E-03	6.00E-04	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene	1.65E-02	6.00E-03	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Beryllium	2.43E-03	4.80E-04	1.43E+02	1.43E+02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds	na	na	5.88E-01	1.32E-01	9.46E-01	1.36E-05			8.00E-06	1.79E-06		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02	1.12E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	4.34E-03	8.57E-04	5.59E+01	5.49E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide	na	na	1.25E-03	2.80E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine	na	na	5.00E+00	1.12E+00	4.26E-01	6.12E-06			3.06E-05	6.85E-06	-2.20E+02	-3.16E-03			-1.58E-02	-3.53E-03	-2.35E+02	-3.38E-03			-1.69E-02	-3.78E-03
Chloroform	5.50E-06	1.09E-06	3.33E-03	7.46E-04	3.19E+01	4.59E-04	2.52E-03	5.00E-04	1.53E-06	3.42E-07		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00	5.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.65E-04	6.00E-05	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Copper	na	na	4.17E-01	9.32E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)	na	na	1.67E-03	3.73E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01	7.46E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)	na	na	5.00E-04	1.12E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not	7.24E-05	1.43E-05	1.25E+00	2.80E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01	7.46E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	na	na	1.43E-04	3.20E-05		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride	na	na	1.11E-01	2.49E-02		0.00E+00			0.00E+00	0.00E+00	-3.05E+03	-4.39E-02			-4.88E-03	-1.09E-03	-3.27E+03	-4.70E-02			-5.22E-03	-1.17E-03
Hydrogen sulfide	na	na	1.00E-01	2.24E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Lead	3.58E-05	1.44E-05	na	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Manganese	na	na	5.00E+00	1.12E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Mercury	na	na	5.76E+01	5.35E+01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methanol	na	na	2.50E-04	5.59E-05		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04	2.80E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (Not	na	na	1.00E-03	2.24E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	3.48E-05	6.86E-06	1.11E-01	2.49E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.64E-04	5.20E-05	2.00E+01	2.00E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	6.39E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	na	na	5.00E-03	1.12E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Phosphorus	na	na	1.43E+01	3.20E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05	1.73E+05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.25E-08	-4.67E-13	-1.57E-04	-3.78E-05	-1.24E-07	-8.08E-08	-3.25E-08	-4.67E-13	-1.57E-04	-3.78E-05	-1.24E-07	-8.08E-08
Propylene (Note 4)	na	na	3.33E-04	7.46E-05		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	na	na	5.00E-02	1.12E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Styrene	na	na	1.11E-03	2.49E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	na	na	1.00E+00	2.24E-01		0.00E+00			0.00E+00	0.00E+00	-9.19E-01	-1.32E-05			-1.32E-05	-2.96E-06	-9.19E-01	-1.32E-05			-1.32E-05	-2.96E-06
Toluene	na	na	3.33E-03	7.46E-04		0.00E+00			0.00E+00	0.00E+00	-1.30E+02	-1.86E-03			-6.21E-06	-1.39E-06	-1.39E+02	-1.99E-03			-6.64E-06	-1.49E-06
Xylenes	na	na	1.43E-03	3.20E-04		0.00E+00			0.00E+00	0.00E+00	-9.96E+01	-1.43E-03			-2.05E-06	-4.58E-07	-1.06E+02	-1.53E-03			-2.19E-06	-4.90E-07
Zinc	na	na	2.86E-02	6.39E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
						sum	2.52E-03	5.00E-04	4.01E-05	8.98E-06		sum	-2.80E-03	-5.60E-04	-2.07E-02	-4.63E-03		sum	-2.98E-03	-5.95E-04	-2.21E-02	-4.95E-03

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these sources further.
Chevron recommends that these sources be combined and modeled as one source.
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3550 and F-3560 both emit from 4 Rhen W stack. Total is shown in 4 Rhen W Total column.
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3570 and F-3580 both emit from 4 Rhen E stack. Total is shown in 4 Rhen E Total column.
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source for carbon disulfide and sulfuric acid mist. Stack heater is source for all other pollutants.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas, refinery fuel gas and LPG (for other constituents, cogen fuel is natural gas and refinery fuel gas)

Attachment AQ-12B
Chevron Refinery Renewal Project
Annual Point Non-Combustion Toxic Emissions

Source No(s)./Status Description Sub-Project				S-4452 New CCR Regen Vent						S-4250 Shutdown A Train CO2 Vent						S-4250 Shutdown B Train CO2 Vent						S-4250 Shutdown A Train Deaerator Vent					
Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	na	na	5.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Arsenic	1.58E-02	5.18E-03	6.20E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	2.90E-05	5.72E-06	1.67E-02	2.05E+01	2.95E-04	8.55E-03	1.69E-03	4.91E-06	1.10E-06		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene	1.65E-02	6.00E-03	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Beryllium	2.43E-03	4.80E-04	1.43E+02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds	na	na	5.88E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	4.34E-03	8.57E-04	5.59E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide	na	na	1.25E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine	na	na	5.00E+00	1.42E+03	2.04E-02			1.02E-01	2.28E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform	5.50E-06	1.09E-06	3.33E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.65E-04	6.00E-05	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Copper	na	na	4.17E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)	na	na	1.67E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)	na	na	5.00E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not	7.24E-05	1.43E-05	1.25E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	na	na	1.43E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride	na	na	1.11E-01	9.88E+03	1.42E-01			1.58E-02	3.53E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	na	na	1.00E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Lead	3.58E-05	1.44E-05	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Manganese	na	na	5.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Mercury	na	na	5.76E+01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methanol	na	na	2.50E-04		0.00E+00			0.00E+00	0.00E+00	-9.16E+03	-1.32E-01			-3.29E-05	-7.37E-06	-9.16E+03	-1.32E-01			-3.29E-05	-7.37E-06	-1.59E+02	-2.29E-03			-5.73E-07	-1.28E-07
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (Not	na	na	1.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	3.48E-05	6.86E-06	1.11E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.64E-04	5.20E-05	2.00E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	8.44E+01	1.21E-03	7.38E-03	1.46E-03	3.47E-05	7.76E-06		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	na	na	5.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Phosphorus	na	na	1.43E+01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05	3.74E-05	5.37E-10	1.81E-01	4.35E-02	1.42E-04	9.29E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)	na	na	3.33E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	na	na	5.00E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Styrene	na	na	1.11E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	na	na	1.00E+00	2.76E+02	3.96E-03			3.96E-03	8.87E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Toluene	na	na	3.33E-03	4.19E+02	6.03E-03			2.01E-05	4.49E-06		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Xylenes	na	na	1.43E-03	3.22E+02	4.63E-03			6.62E-06	1.48E-06		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Zinc	na	na	2.86E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
					sum	1.97E-01	4.67E-02	1.22E-01	2.74E-02		sum	0.00E+00	0.00E+00	-3.29E-05	-7.37E-06		sum	0.00E+00	0.00E+00	-3.29E-05	-7.37E-06		sum	0.00E+00	0.00E+00	-5.73E-07	-1.28E-07

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissio
Chevron recommends that these sources be combined and modeled as one sou
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the
Note 3: Each SRU and its associated stack heater emit from a common point.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural ga

Attachment AQ-12B
Chevron Refinery Renewal Project
Annual Point Non-Combustion Toxic Emissions

Source No(s)./Status Description Sub-Project				S-4250 Shutdown B Train Deaearator Vent						S-4449 New Deaerator Vent Hydrogen Plant						S-4396 Modified Sulfur Loading Rack					
Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million) (1)	Offsite Worker Cancer Risk Model Input (per million) (1)	Residential Chronic HI Model Input (2)	Offsite Worker Chronic HI Model Input (2)
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	na	na	5.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Arsenic	1.58E-02	5.18E-03	6.20E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	2.90E-05	5.72E-06	1.67E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene	1.65E-02	6.00E-03	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Beryllium	2.43E-03	4.80E-04	1.43E+02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds	na	na	5.88E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	4.34E-03	8.57E-04	5.59E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide	na	na	1.25E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chlorine	na	na	5.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Chloroform	5.50E-06	1.09E-06	3.33E-03		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.65E-04	6.00E-05	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Copper	na	na	4.17E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)	na	na	1.67E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)	na	na	5.00E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Not	7.24E-05	1.43E-05	1.25E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane	na	na	1.43E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride	na	na	1.11E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	na	na	1.00E-01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00	4.83E+01	6.94E-04			6.94E-05	1.55E-05
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Lead	3.58E-05	1.44E-05	na		0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00				0.00E+00	0.00E+00	0.00E+00		
Manganese	na	na	5.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Mercury	na	na	5.76E+01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methanol	na	na	2.50E-04	-1.59E+02	-2.29E-03			-5.73E-07	-1.28E-07	0.00E+00	0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE)	5.21E-07	1.03E-07	1.25E-04		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (MEK) (Not	na	na	1.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Naphthalene	3.48E-05	6.86E-06	1.11E-01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.64E-04	5.20E-05	2.00E+01		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	na	na	5.00E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Phosphorus	na	na	1.43E+01		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)	na	na	3.33E-04		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Selenium	na	na	5.00E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Styrene	na	na	1.11E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist	na	na	1.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Toluene	na	na	3.33E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Xylenes	na	na	1.43E-03		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
Zinc	na	na	2.86E-02		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00		0.00E+00			0.00E+00	0.00E+00
				sum		0.00E+00	0.00E+00	-5.73E-07	-1.28E-07	sum		0.00E+00	0.00E+00	0.00E+00	0.00E+00	sum		0.00E+00	0.00E+00	6.94E-05	1.55E-05

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissio
Chevron recommends that these sources be combined and modeled as one sou
Calculations have been done on this basis.

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Note 5: Per the EERC document, for these constituents cogen fuel is natural ga

Attachment AQ-12B
Chevron Refinery Renewal Project
Annual Fugitive Toxic Emissions

Source No(s)./Station
Description
Sub-Project

Toxic Air Contaminant	Residential Unit Risk Value From HARP (ug/m3)-1	Offsite Worker Unit Risk Value From HARP (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)	Offsite Worker HI per unit concentration, HI/(ug/m3)	[redacted]
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	2.48E-02	[redacted]
Ammonia @ 10 ppm slip	na	na	5.00E-03	1.12E-03	[redacted]
Arsenic	1.50E-02	5.10E-03	6.20E+01	5.94E+01	[redacted]
Benzene	2.90E-05	5.72E-06	1.67E-02	3.73E-03	[redacted]
Benz(a)anthracene	1.65E-03	6.00E-04	na	na	[redacted]
Benzo(a)pyrene	1.65E-02	6.00E-03	na	na	[redacted]
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	na	[redacted]
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	na	[redacted]
Beryllium	2.43E-03	4.80E-04	1.43E+02	1.43E+02	[redacted]
Bromine & compounds	na	na	5.88E-01	1.32E-01	[redacted]
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02	1.12E-02	[redacted]
Cadmium	4.34E-03	8.57E-04	5.50E+01	5.40E+01	[redacted]
Carbon disulfide	na	na	1.25E-03	2.80E-04	[redacted]
Chlorine	na	na	5.00E+00	1.12E+00	[redacted]
Chloroform	5.50E-06	1.09E-06	3.33E-03	7.46E-04	[redacted]
Chromium (hexavalent)	1.46E-01	2.91E-02	5.00E+00	5.00E+00	[redacted]
Chrysene	1.65E-04	6.00E-05	na	na	[redacted]
Copper	na	na	4.17E-01	9.32E-02	[redacted]
Cresols (Note 4)	na	na	1.67E-03	3.73E-04	[redacted]
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na	na	[redacted]
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01	7.46E-02	[redacted]
Ethylbenzene (Note 4)	na	na	5.00E-04	1.12E-04	[redacted]
Ethylene Dibromide (EDB) (Note 4)	7.24E-05	1.43E-05	1.25E+00	2.80E-01	[redacted]
Formaldehyde	6.00E-06	1.20E-06	3.33E-01	7.46E-02	[redacted]
n-Hexane	na	na	1.43E-04	3.20E-05	[redacted]
Hydrogen chloride	na	na	1.11E-01	2.49E-02	[redacted]
Hydrogen sulfide	na	na	1.00E-01	2.24E-02	[redacted]
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	na	[redacted]
Lead	3.80E-05	1.44E-05	na	na	[redacted]
Manganese	na	na	5.00E+00	1.12E+00	[redacted]
Mercury	na	na	5.76E+01	5.35E+01	[redacted]
Methanol	na	na	2.50E-04	5.58E-05	[redacted]
Methyl tert-Butyl Ether (MTBE) (Note 4)	5.21E-07	1.03E-07	1.25E-04	2.80E-05	[redacted]
Methyl Ethyl Ketone (Note 4)	na	na	1.00E-03	2.24E-04	[redacted]
Naphthalene	3.40E-05	6.80E-06	1.11E-01	2.48E-02	[redacted]
Nickel	2.64E-04	5.20E-05	2.00E+01	2.00E+01	[redacted]
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	6.38E-03	[redacted]
Phenol	na	na	5.00E-03	1.12E-03	[redacted]
Phosphorus	na	na	1.43E+01	3.20E+00	[redacted]
Polychlorinated dioxins/furans	3.37E+02	8.10E+01	2.65E+05	1.73E+05	[redacted]
Propylene (Note 4)	na	na	3.33E-04	7.46E-05	[redacted]
Selenium	na	na	5.00E-02	1.12E-02	[redacted]
Styrene	na	na	1.11E-03	2.48E-04	[redacted]
Sulfuric acid mist	na	na	1.00E+00	2.24E-01	[redacted]
Toluene	na	na	3.33E-03	7.46E-04	[redacted]
Xylenes	na	na	1.43E-03	3.20E-04	[redacted]
Zinc	na	na	2.86E-02	6.38E-03	[redacted]

Source	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million)(1)	Offsite Worker Cancer Risk Model Input (per million)(1)	Residential Chronic HI Model Input(2)	Offsite Worker Chronic HI Model Input(2)
S-4250 fugitive - Shutdown, Hydrogen A Train, Hydrogen Plant Fugitives (rows per contaminant)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S-4250 fugitive - Shutdown, Hydrogen A Train: sum			-3.12E-03	-6.14E-04	-2.10E-05	-4.69E-06
S-4250 fugitive - Shutdown, Hydrogen B Train, Hydrogen Plant Fugitives (rows per contaminant)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S-4250 fugitive - Shutdown, Hydrogen B Train: sum			-5.76E-03	-1.14E-03	-3.45E-05	-7.72E-06
S-4440 fugitive - New, Hydrogen 1 Train, Hydrogen Plant Fugitives (rows per contaminant)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S-4440 fugitive - New, Hydrogen 1 Train: sum			1.25E-02	2.47E-03	6.61E-05	1.48E-05
S-4450 fugitive - New, Hydrogen 2 Train, Hydrogen Plant Fugitives (rows per contaminant)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S-4450 fugitive - New, Hydrogen 2 Train: sum			1.25E-02	2.47E-03	6.61E-05	1.48E-05
S-4129 fugitive - Shutdown, No. 1 Power Plant - 1 Boiler, Power Plant Fugitives (rows per contaminant)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S-4129 fugitive - Shutdown, No. 1 Power Plant - 1 Boiler: sum			-6.93E-05	-1.37E-05	-3.97E-07	-8.88E-08

Multiple sources with Multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these sources further.
Chevron recommends that these sources be combined and modeled as one source
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3550 and F-3560 both emit from 4 Rhen W stack. Total is shown in 4 Rhen W Total column.
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3570 and F-3580 both emit from 4 Rhen E stack. Total is shown in 4 Rhen E Total column.
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source for carbon disulfide and sulfuric acid mist. Stack heater is source for all other pollutants.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas, refinery fuel gas and LPG (for other constituents, cogen fuel is natural gas and refinery fuel gas)

Attachment AQ-128
Chevron Refinery Renewal Project
Annual Fugitive Toxic Emissions

Source No(s)./Station
Description
Sub-Project

S-4131 fugitive Shutdown — No. 1 Power Plant - 3 Boiler — Power Plant Fugitives
S-4132 fugitive Shutdown — No. 1 Power Plant - 4 Boiler — Power Plant Fugitives
S-4133 fugitive Shutdown — No. 1 Power Plant - 5 Boiler — Power Plant Fugitives
S-4136 fugitive Shutdown — No. 1 Power Plant - 7 Boiler — Power Plant Fugitives

Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)	TAC Emissions (lb/yr)
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01	
Ammonia @ 10 ppm slip	na	na	5.00E-03	0.00E+00
Arsenic	1.58E-02	5.10E-03	6.20E+01	
Benzene	2.90E-05	5.72E-06	1.67E-02	0.00E+00
Benz(a)anthracene	1.65E-03	6.00E-04	na	
Benzo(a)pyrene	1.65E-02	6.00E-03	na	
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na	
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na	
Beryllium	2.43E-03	4.80E-04	1.43E+02	
Bromine & compounds	na	na	5.88E-01	
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02	-1.91E-02
Cadmium	4.34E-03	8.57E-04	5.59E+01	
Carbon disulfide	na	na	1.25E-03	
Chlorine	na	na	5.00E+00	
Chloroform	5.50E-06	1.09E-06	3.33E-03	
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00	
Chrysene	1.65E-04	6.00E-05	na	
Copper	na	na	4.17E-01	
Cresols (Note 4)	na	na	1.67E-03	-1.28E-02
Dibenz(a,h)anthracene	6.48E-03	2.21E-03	na	
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01	0.00E+00
Ethylbenzene (Note 4)	na	na	5.00E-04	-7.28E-02
Ethylene Dibromide (EDB) (Note 4)	7.24E-05	1.43E-05	1.25E+00	0.00E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01	
n-Hexane	na	na	1.43E-04	-4.39E-02
Hydrogen chloride	na	na	1.11E-01	
Hydrogen sulfide	na	na	1.00E-01	-2.08E-01
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na	
Lead	3.58E-05	1.44E-05	na	
Manganese	na	na	5.00E+00	
Mercury	na	na	5.78E+01	
Methanol	na	na	2.50E-04	0.00E+00
Methyl tert-Butyl Ether (MTBE) (Note 4)	5.21E-07	1.03E-07	1.25E-04	-8.03E-03
Methyl Ethyl Ketone (Note 4)	na	na	1.00E-04	0.00E+00
Naphthalene	3.40E-05	6.86E-06	1.11E-01	-4.27E-02
Nickel	2.84E-04	5.20E-05	2.00E+01	
Perchloroethylene (Note 4)	6.08E-06	1.20E-06	2.86E-02	0.00E+00
Phenol	na	na	5.00E-03	-6.53E-02
Phosphorus	na	na	1.43E+01	
Polychlorinated dibenzofurans	3.37E+02	8.10E+01	2.65E+05	
Propylene (Note 4)	na	na	3.33E-04	-2.05E+00
Selenium	na	na	5.00E-02	
Styrene	na	na	1.11E-03	0.00E+00
Sulfuric acid mist	na	na	1.00E+00	
Toluene	na	na	3.33E-03	-1.28E-02
Xylenes	na	na	1.43E-03	-4.72E-02
Zinc	na	na	2.86E-02	

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these
Chevron recommends that these sources be combined and modeled as one source.
Calculations have been done on this basis.

Note 1: 4 Rheni West fuel gas data were reported separately for only part of the baseline. Em
Note 2: 4 Rheni East fuel gas data were reported separately for only part of the baseline. Em
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas, refinery fuel

Attachment AQ-12B
Cherokee Refinery Renewal Project
Annual Fugitive Toxic Emissions

Source Name/Status
Description
Sub-Project

Toxic Air Contaminant	Residential Unit Risk Value From HRAP, µg/m3-1	Offsite Worker Unit Risk Value From HRAP, µg/m3-1	Residential HI per unit concentration, HI/µg/m3
Acetaldehyde	2.20E-06	5.73E-07	1.17E-01
Acrolein	1.58E-02	5.19E-03	4.20E+01
Acrylamide	2.20E-04	7.73E-05	1.57E-01
Acrylonitrile	1.65E-03	5.20E-04	na
Benzo[a]anthracene	1.65E-03	1.80E-03	na
Benzo[a]pyrene	1.65E-03	1.80E-04	na
Benzo[b]fluoranthene	1.65E-03	1.80E-04	na
Benzo[k]fluoranthene	1.65E-03	1.80E-04	na
Benzene	2.90E-02	4.60E-06	1.40E+02
Benzidine & compounds	na	na	1.88E-01
1,3-Butadiene	1.70E-04	1.43E-05	1.70E-02
Cadmium	4.34E-03	8.57E-04	5.58E+01
Carbon disulfide	na	na	1.25E-03
Chlorine	na	na	5.80E+00
Chloroform	5.34E-06	1.88E-06	3.33E-03
Cyanides (inorganic)	1.48E-01	2.91E-02	5.08E+00
Chrysene	1.65E-04	5.60E-05	na
Copper	na	na	4.17E-01
Cumene (Note 4)	na	na	1.67E-03
Dibenzo[a,h]anthracene	5.49E-05	2.71E-03	na
Dichloromethane (DCM) (Note 4)	na	na	3.33E-01
Ethylbenzene (Note 4)	na	na	5.88E-04
Ethylene Dichloride (EDB) (Note 4)	7.34E-05	1.43E-05	1.25E+00
Formaldehyde	6.60E-05	1.30E-05	1.37E-01
Formazine	na	na	1.43E-04
Hydrogen chloride	na	na	1.11E-01
Hydrogen sulfide	na	na	1.88E-01
Indeno[1,2,3-cd]pyrene	1.65E-04	1.80E-04	na
Lead	3.58E-05	1.44E-05	na
Manganese	na	na	5.88E+00
Mercury	na	na	5.79E+01
Methanol	na	na	3.50E-04
Methyl tert-butyl Ether (MTBE) (Note 4)	3.21E-07	1.03E-07	1.25E-04
Methyl Ethyl Ketone (Note 4)	0.00E+00	na	1.00E-03
Naphthalene	3.49E-05	6.86E-06	1.11E-01
Nickel	2.54E-04	1.20E-05	2.00E+00
Perchloroethylene (Note 4)	5.08E-06	1.20E-06	2.94E-02
Phenol	na	na	5.88E-03
Phosphorus	na	na	1.43E+01
Polycyclicorganic micromatters	3.37E+02	8.18E+01	2.05E+00
Propylene (Note 4)	na	na	3.33E-04
Selenium	na	na	5.88E-03
Styrene	na	na	1.11E-01
Sulfuric acid mist	na	na	1.00E+00
Toluene	na	na	3.33E-03
Xylenes	na	na	1.43E-03
Zinc	na	na	5.88E-02

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these
Chevron environmental Staff these sources be combined and modeled as one source.
Calculations have been done on this basis.

Note 1: 4 Rivers Water fold gas data were reported separately for only part of the transfers. See
Note 2: 4 River East fold gas data were reported separately for only part of the transfers. See
Note 3: Each EMU and its associated stack header emit from a common tank, EMUs assume
Note 4: Chemical omitted as fugitive emissions only
Note 5: Per the SERC measurement, for these constituents oxygen fuel is natural gas, refinery fuel

| | S-4471 & S-4474 fugitive New Coker 3 Power Plant Fugitives | | |

Attachment AQ-12B
Chevron Refinery Renewal Project
Annual Fugitive Toxic Emissions

Toxic Air Contaminant	Residential Unit Risk Value From HARP, (ug/m3)-1	Offsite Worker Unit Risk Value From HARP, (ug/m3)-1	Residential HI per unit concentration, HI/(ug/m3)
Source Site(s)/Stacks	[illegible]		
Description	[illegible]		
Sub-Project	[illegible]		
Acetaldehyde	2.90E-06	5.72E-07	1.11E-01
Ammonia @ 10 ppm slip	na	na	5.00E-03
Arsenic	1.58E-02	5.18E-03	6.20E+01
Benzene	2.90E-05	5.72E-06	1.67E-02
Benzo(a)anthracene	1.65E-03	6.00E-04	na
Benzo(a)pyrene	1.65E-02	6.00E-03	na
Benzo(b)fluoranthene	1.65E-03	6.00E-04	na
Benzo(k)fluoranthene	1.65E-03	6.00E-04	na
Beryllium	2.40E-03	4.80E-04	1.43E+02
Bromine & compounds	na	na	5.88E-01
1,3-Butadiene	1.74E-04	3.43E-05	5.00E-02
Cadmium	4.34E-03	8.57E-04	5.00E+01
Carbon disulfide	na	na	1.25E-03
Chlorine	na	na	5.00E+00
Chloroform	5.50E-06	1.09E-06	3.33E-03
Chromium (hexavalent)	1.48E-01	2.91E-02	5.00E+00
Chrysene	1.65E-04	6.00E-05	na
Copper	na	na	4.17E-01
Cresols (Note 4)	na	na	1.67E-03
Dibenz(a,h)anthracene	6.40E-03	2.21E-03	na
Diethanolamine (DEA) (Note 4)	na	na	3.33E-01
Ethylbenzene (Note 4)	na	na	5.00E-04
Ethylene Dibromide (EDB) (Note 4)	7.24E-05	1.43E-05	1.25E+00
Formaldehyde	6.08E-06	1.20E-06	3.33E-01
n-Hexane	na	na	1.43E-04
Hydrogen chloride	na	na	1.11E-01
Hydrogen sulfide	na	na	1.00E-01
Indeno(1,2,3-cd)pyrene	1.65E-03	6.00E-04	na
Lead	3.50E-05	1.44E-05	na
Manganese	na	na	5.00E+00
Mercury	na	na	5.70E+01
Methanol	na	na	2.50E-04
Methyl tert-Butyl Ether (MTBE) (Note 4)	5.21E-07	1.03E-07	1.25E-04
Methyl Ethyl Ketone (Note 4)	na	na	1.00E-03
Naphthalene	3.48E-05	6.86E-06	1.11E-01
Nickel	2.64E-04	5.20E-05	2.00E+01
Perchloroethylene (Note 4)	6.88E-06	1.20E-06	2.86E-02
Phenol	na	na	5.00E-03
Phosphorus	na	na	1.43E+01
Polychlorinated dibenzofurans	3.37E+02	8.10E+01	2.50E+05
Propylene (Note 4)	na	na	3.33E-04
Selenium	na	na	5.00E-02
Styrene	na	na	1.11E-03
Sulfuric acid mist	na	na	1.00E+00
Toluene	na	na	3.33E-03
Xylenes	na	na	1.43E-03
Zinc	na	na	2.86E-02

S-4227, S-4228 & S4229 fugitive Modified — SRU's — H2 Purity Fugitives

Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million)	Offsite Worker Cancer Risk Model Input (per million)	Residential Chronic HI Model Input	Offsite Worker Chronic HI Model Input
Acetaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	1.04E+01	1.50E-04			7.48E-07	1.67E-07
Arsenic		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene		0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene		0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Beryllium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene		0.00E+00	0.00E+00	0.00E+00		
Copper		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene		0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	[illegible]	1.66E-02			5.54E-03	1.24E-03
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	2.71E+02	3.17E-03			3.17E-04	7.10E-05
Indeno(1,2,3-cd)pyrene		0.00E+00	0.00E+00	0.00E+00		
Lead		0.00E+00	0.00E+00	0.00E+00		
Manganese		0.00E+00			0.00E+00	0.00E+00
Mercury		0.00E+00			0.00E+00	0.00E+00
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (Note 4)		0.00E+00			0.00E+00	0.00E+00
Naphthalene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol		0.00E+00			0.00E+00	0.00E+00
Phosphorus		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dibenzofurans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium		0.00E+00			0.00E+00	0.00E+00
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist		0.00E+00			0.00E+00	0.00E+00
Toluene		0.00E+00			0.00E+00	0.00E+00
Xylenes		0.00E+00			0.00E+00	0.00E+00
Zinc		0.00E+00			0.00E+00	0.00E+00
		sum	0.00E+00	0.00E+00	5.06E-03	1.31E-03

S-4250 fugitive Shutdown — Hydrogen A/B Trns — H2 Purity Fugitives

Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million)	Offsite Worker Cancer Risk Model Input (per million)	Residential Chronic HI Model Input	Offsite Worker Chronic HI Model Input
Acetaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	-1.60E+01	-2.31E-04			-1.15E-06	-2.58E-07
Arsenic		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene		0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene		0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Beryllium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene		0.00E+00	0.00E+00	0.00E+00		
Copper		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene		0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide		0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene		0.00E+00	0.00E+00	0.00E+00		
Lead		0.00E+00	0.00E+00	0.00E+00		
Manganese		0.00E+00			0.00E+00	0.00E+00
Mercury		0.00E+00			0.00E+00	0.00E+00
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (Note 4)		0.00E+00			0.00E+00	0.00E+00
Naphthalene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol		0.00E+00			0.00E+00	0.00E+00
Phosphorus		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dibenzofurans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium		0.00E+00			0.00E+00	0.00E+00
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist		0.00E+00			0.00E+00	0.00E+00
Toluene		0.00E+00			0.00E+00	0.00E+00
Xylenes		0.00E+00			0.00E+00	0.00E+00
Zinc		0.00E+00			0.00E+00	0.00E+00
		sum	0.00E+00	0.00E+00	-1.15E-06	-2.58E-07

S-4449 and S-4450 fugitives New — Hydrogen 1/2 Trains — H2 Purity Fugitives

Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million)	Offsite Worker Cancer Risk Model Input (per million)	Residential Chronic HI Model Input	Offsite Worker Chronic HI Model Input
Acetaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	4.25E+01	6.11E-04			3.06E-06	6.84E-07
Arsenic		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene		0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene		0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Beryllium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene		0.00E+00	0.00E+00	0.00E+00		
Copper		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene		0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide	1.90E-03	2.74E-08			2.74E-09	6.13E-10
Indeno(1,2,3-cd)pyrene		0.00E+00	0.00E+00	0.00E+00		
Lead		0.00E+00	0.00E+00	0.00E+00		
Manganese		0.00E+00			0.00E+00	0.00E+00
Mercury		0.00E+00			0.00E+00	0.00E+00
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (Note 4)		0.00E+00			0.00E+00	0.00E+00
Naphthalene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol		0.00E+00			0.00E+00	0.00E+00
Phosphorus		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dibenzofurans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium		0.00E+00			0.00E+00	0.00E+00
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist		0.00E+00			0.00E+00	0.00E+00
Toluene		0.00E+00			0.00E+00	0.00E+00
Xylenes		0.00E+00			0.00E+00	0.00E+00
Zinc		0.00E+00			0.00E+00	0.00E+00
		sum	0.00E+00	0.00E+00	3.06E-06	6.84E-07

S-4452 fugitive New — CCR — H2 Purity Fugitives

Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million)	Offsite Worker Cancer Risk Model Input (per million)	Residential Chronic HI Model Input	Offsite Worker Chronic HI Model Input
Acetaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	3.21E+01	4.61E-04			2.31E-06	5.16E-07
Arsenic		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene		0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene		0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Beryllium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene		0.00E+00	0.00E+00	0.00E+00		
Copper		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene		0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide		0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene		0.00E+00	0.00E+00	0.00E+00		
Lead		0.00E+00	0.00E+00	0.00E+00		
Manganese		0.00E+00			0.00E+00	0.00E+00
Mercury		0.00E+00			0.00E+00	0.00E+00
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (Note 4)		0.00E+00			0.00E+00	0.00E+00
Naphthalene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol		0.00E+00			0.00E+00	0.00E+00
Phosphorus		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dibenzofurans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium		0.00E+00			0.00E+00	0.00E+00
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist		0.00E+00			0.00E+00	0.00E+00
Toluene		0.00E+00			0.00E+00	0.00E+00
Xylenes		0.00E+00			0.00E+00	0.00E+00
Zinc		0.00E+00			0.00E+00	0.00E+00
		sum	0.00E+00	0.00E+00	2.31E-06	5.16E-07

S-4475, S-4476, S-4473, & S-4474 fugitives New — Cogens - New — H2 Purity Fugitives

Toxic Air Contaminant	TAC Emissions, lbs/yr	TAC Emissions, g/s	Residential Cancer Risk Model Input (per million)	Offsite Worker Cancer Risk Model Input (per million)	Residential Chronic HI Model Input	Offsite Worker Chronic HI Model Input
Acetaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia @ 10 ppm slip	3.21E+01	4.61E-04			2.31E-06	5.16E-07
Arsenic		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene		0.00E+00	0.00E+00	0.00E+00		
Benzo(a)pyrene		0.00E+00	0.00E+00	0.00E+00		
Benzo(b)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Benzo(k)fluoranthene		0.00E+00	0.00E+00	0.00E+00		
Beryllium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromine & compounds		0.00E+00			0.00E+00	0.00E+00
1,3-Butadiene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon disulfide		0.00E+00			0.00E+00	0.00E+00
Chlorine		0.00E+00			0.00E+00	0.00E+00
Chloroform		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (hexavalent)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene		0.00E+00	0.00E+00	0.00E+00		
Copper		0.00E+00			0.00E+00	0.00E+00
Cresols (Note 4)		0.00E+00			0.00E+00	0.00E+00
Dibenz(a,h)anthracene		0.00E+00	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00
Ethylbenzene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Ethylene Dibromide (EDB) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
n-Hexane		0.00E+00			0.00E+00	0.00E+00
Hydrogen chloride		0.00E+00			0.00E+00	0.00E+00
Hydrogen sulfide		0.00E+00			0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene		0.00E+00	0.00E+00	0.00E+00		
Lead		0.00E+00	0.00E+00	0.00E+00		
Manganese		0.00E+00			0.00E+00	0.00E+00
Mercury		0.00E+00			0.00E+00	0.00E+00
Methanol		0.00E+00			0.00E+00	0.00E+00
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone (Note 4)		0.00E+00			0.00E+00	0.00E+00
Naphthalene		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchloroethylene (Note 4)		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol		0.00E+00			0.00E+00	0.00E+00
Phosphorus		0.00E+00			0.00E+00	0.00E+00
Polychlorinated dibenzofurans		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene (Note 4)		0.00E+00			0.00E+00	0.00E+00
Selenium		0.00E+00			0.00E+00	0.00E+00
Styrene		0.00E+00			0.00E+00	0.00E+00
Sulfuric acid mist		0.00E+00			0.00E+00	0.00E+00
Toluene		0.00E+00			0.00E+00	0.00E+00
Xylenes		0.00E+00			0.00E+00	0.00E+00
Zinc		0.00E+00			0.00E+00	0.00E+00
		sum	0.00E+00	0.00E+00	2.31E-06	5.16E-07

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these
Chevron recommends that these sources be combined and modeled as one source.
Calculations have been done on this basis

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the baseline. Ba
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the baseline. Ba
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas; refinery fuel

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Fugitive Toxic Emissions

Source No(s)./Status Description Sub-Project		S-4333 fugitive Modified Fugitives at [illegible] Fugitives General				S-4250 fugitive Shutdown Hydrogen A Train Hydrogen Plant Fugitives			
Toxic Air Contaminant	Acute Inhalation, (ug/m3)	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	na		0.00E+00				0.00E+00		
Ammonia @ 10 ppm slip	3.2E+03		0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Arsenic	1.9E-01		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzene	1.3E+03		0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	na		0.00E+00				0.00E+00		
Benzo(a)pyrene	na		0.00E+00				0.00E+00		
Benzo(b)fluoranthene	na		[illegible]				0.00E+00		
Benzo(k)fluoranthene	na		[illegible]				0.00E+00		
Beryllium	na		[illegible]				0.00E+00		
Bromine & compounds	na		[illegible]				0.00E+00		
1,3-Butadiene	na		[illegible]			-1.42E-04	-1.79E-05		
Cadmium	na		[illegible]				0.00E+00		
Carbon disulfide	6.2E+03		[illegible]	[illegible]			0.00E+00	0.00E+00	
Chlorine	2.1E+02		[illegible]	[illegible]			0.00E+00	0.00E+00	
Chloroform	1.5E+02		[illegible]	[illegible]			0.00E+00	0.00E+00	
Chromium (hexavalent)	na		[illegible]				0.00E+00		
Chrysene	na		[illegible]				0.00E+00		
Copper	1.0E+02		[illegible]	[illegible]			0.00E+00	0.00E+00	
Cresols (Note 4)	na		[illegible]			0.00E+00	0.00E+00		
Dibenz(a,h)anthracene	na		[illegible]				0.00E+00		
Diethanolamine (DEA) (Note 4)	na		[illegible]			0.00E+00	0.00E+00		
Ethylbenzene (Note 4)	na		[illegible]			0.00E+00	0.00E+00		
Ethylene Dibromide (EDB) (Note 4)	na		[illegible]			0.00E+00	0.00E+00		
Formaldehyde	9.4E+01		[illegible]	[illegible]			0.00E+00	0.00E+00	
n-Hexane	na		[illegible]			-3.11E-04	-3.92E-05		
Hydrogen chloride	2.1E+03		[illegible]	[illegible]			0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01		[illegible]	[illegible]		-1.54E-03	-1.94E-04	-4.62E-06	
Indeno(1,2,3-cd)pyrene	na		[illegible]				0.00E+00		
Lead	na		[illegible]		[illegible]		0.00E+00		0.00E+00
Manganese	na		[illegible]				0.00E+00		
Mercury	1.8E+00		[illegible]	[illegible]			0.00E+00	0.00E+00	
Methanol	2.8E+04		[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na		[illegible]			0.00E+00	0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04		[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	
Naphthalene	na		[illegible]			0.00E+00	0.00E+00		
Nickel	6.0E+00		[illegible]	[illegible]			0.00E+00	0.00E+00	
Perchloroethylene (Note 4)	2.0E+04		[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	
Phenol	5.8E+03		[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	
Phosphorus	na		[illegible]				0.00E+00		
Polychlorinated dioxins/furans	na		[illegible]				0.00E+00		
Propylene (Note 4)	na		[illegible]			-1.52E-02	-1.92E-03		
Selenium	na		[illegible]				0.00E+00		
Styrene	2.1E+04		[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02		[illegible]	[illegible]			0.00E+00	0.00E+00	
Toluene	3.7E+04		[illegible]	[illegible]		0.00E+00	0.00E+00	0.00E+00	
Xylenes	2.2E+04		[illegible]	[illegible]		-8.60E-05	-1.08E-05	-4.92E-10	
Zinc	na		[illegible]				0.00E+00		
			sum	0.00E+00	0.00E+00		sum	-4.62E-06	0.00E+00

Source No(s)./Status Description Sub-Project	S-4250 fugitive Shutdown Hydrogen B Train Hydrogen Plant Fugitives				S-4449 fugitive New Hydrogen 1 Train Hydrogen Plant Fugitives			
Toxic Air Contaminant	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde		0.00E+00				0.00E+00		
Ammonia @ 10 ppm slip	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Arsenic		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzene	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene		0.00E+00				0.00E+00		
Benzo(a)pyrene		0.00E+00				0.00E+00		
Benzo(b)fluoranthene		0.00E+00				0.00E+00		
Benzo(k)fluoranthene		0.00E+00				0.00E+00		
Beryllium		0.00E+00				0.00E+00		
Bromine & compounds		0.00E+00				0.00E+00		
1,3-Butadiene	-2.03E-04	-2.56E-05			3.19E-04	4.02E-05		
Cadmium		0.00E+00				0.00E+00		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)		0.00E+00				0.00E+00		
Chrysene		0.00E+00				0.00E+00		
Copper		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Cresols (Note 4)	-8.73E-05	-1.10E-05			3.71E-04	4.67E-05		
Dibenz(a,h)anthracene		0.00E+00				0.00E+00		
Diethanolamine (DEA) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Ethylbenzene (Note 4)	-5.06E-05	-6.38E-06			2.15E-04	2.71E-05		
Ethylene Dibromide (EDB) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Formaldehyde		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
n-Hexane	-4.72E-04	-5.95E-05			6.97E-04	8.78E-05		
Hydrogen chloride		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	-2.20E-03	-2.78E-04	-6.61E-06		3.46E-03	4.35E-04	1.04E-05	
Indeno(1,2,3-cd)pyrene		0.00E+00				0.00E+00		
Lead		0.00E+00		0.00E+00		0.00E+00		0.00E+00
Manganese		0.00E+00				0.00E+00		
Mercury		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methanol	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	-4.19E-05	-5.28E-06				0.00E+00		
Methyl Ethyl Ketone (Note 4)	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Naphthalene	-2.97E-04	-3.74E-05			1.26E-03	1.59E-04		
Nickel		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Perchloroethylene (Note 4)	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Phenol	-4.54E-04	-5.72E-05	-9.86E-09		1.93E-03	2.43E-04	4.19E-08	
Phosphorus		0.00E+00				0.00E+00		
Polychlorinated dioxins/furans		0.00E+00				0.00E+00		
Propylene (Note 4)	-2.17E-02	-2.74E-03			3.41E-02	4.30E-03		
Selenium		0.00E+00				0.00E+00		
Styrene	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Sulfuric acid mist		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Toluene	-8.73E-05	-1.10E-05	-2.97E-10		3.71E-04	4.67E-05	1.26E-09	
Xylenes	-3.36E-04	-4.23E-05	-1.92E-09		2.62E-04	3.30E-05	1.50E-09	
Zinc		0.00E+00				0.00E+00		
		sum	-6.62E-06	0.00E+00		sum	1.04E-05	0.00E+00

Source No(s)./Status Description Sub-Project	S-4450 fugitive New Hydrogen 2 Train Hydrogen Plant Fugitives				S-4129 fugitive Shutdown No. 1 Power Plant - 1 Boiler Power Plant Fugitives			
Toxic Air Contaminant	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde		0.00E+00				0.00E+00		
Ammonia @ 10 ppm slip	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Arsenic		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzene	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene		0.00E+00				0.00E+00		
Benzo(a)pyrene		0.00E+00				0.00E+00		
Benzo(b)fluoranthene		0.00E+00				0.00E+00		
Benzo(k)fluoranthene		0.00E+00				0.00E+00		
Beryllium		0.00E+00				0.00E+00		
Bromine & compounds		0.00E+00				0.00E+00		
1,3-Butadiene	3.19E-04	4.02E-05			-2.19E-06	-2.75E-07		
Cadmium		0.00E+00				0.00E+00		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)		0.00E+00				0.00E+00		
Chrysene		0.00E+00				0.00E+00		
Copper		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Cresols (Note 4)	3.71E-04	4.67E-05			-1.43E-06	-1.81E-07		
Dibenz(a,h)anthracene		0.00E+00				0.00E+00		
Diethanolamine (DEA) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Ethylbenzene (Note 4)	2.15E-04	2.71E-05			-8.32E-07	-1.05E-07		
Ethylene Dibromide (EDB) (Note 4)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Formaldehyde		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
n-Hexane	6.97E-04	8.78E-05			-5.24E-06	-6.60E-07		
Hydrogen chloride		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	3.46E-03	4.35E-04	1.04E-05		-2.37E-05	-2.98E-06	-7.11E-06	
Indeno(1,2,3-cd)pyrene		0.00E+00				0.00E+00		
Lead		0.00E+00		0.00E+00		0.00E+00		0.00E+00
Manganese		0.00E+00				0.00E+00		
Mercury		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methanol	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00			-6.88E-07	-8.67E-08		
Methyl Ethyl Ketone (Note 4)	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Naphthalene	1.26E-03	1.59E-04			-4.88E-06	-6.14E-07		
Nickel		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Perchloroethylene (Note 4)	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Phenol	1.93E-03	2.43E-04	4.19E-08		-7.46E-06	-9.40E-07	-1.62E-10	
Phosphorus		0.00E+00				0.00E+00		
Polychlorinated dioxins/furans		0.00E+00				0.00E+00		
Propylene (Note 4)	3.41E-02	4.30E-03			-2.34E-04	-2.95E-05		
Selenium		0.00E+00				0.00E+00		
Styrene	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Sulfuric acid mist		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Toluene	3.71E-04	4.67E-05	1.26E-09		-1.43E-06	-1.81E-07	-4.88E-12	
Xylenes	2.62E-04	3.30E-05	1.50E-09		-4.82E-06	-6.07E-07	-2.76E-11	
Zinc		0.00E+00				0.00E+00		
		sum	1.04E-05	0.00E+00		sum	-7.13E-08	0.00E+00

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these sources further.
Chevron recommends that these sources be combined and modeled as one source.
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3550 and F-3560 both emit from 4 Rhen W stack. Total is shown in 4 Rhen W Total column.
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3570 and F-3580 both emit from 4 Rhen E stack. Total is shown in 4 Rhen E Total column.
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source for carbon disulfide and sulfuric acid mist. Stack heater is source for all other pollutants.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas, refinery fuel gas and LPG (for other constituents, cogen fuel is natural gas and refinery fuel gas)

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Fugitive Toxic Emissions

Source No(s)./Status Description Sub-Project		S-4131 fugitive Shutdown No. 1 Power Plant - 3 Boiler Power Plant Fugitives				S-4132 fugitive Shutdown No. 1 Power Plant - 4 Boiler Power Plant Fugitives				S-4133 fugitive Shutdown No. 1 Power Plant - 5 Boiler Power Plant Fugitives				S-4135 fugitive Shutdown No. 1 Power Plant - 7 Boiler Power Plant Fugitives				[illegible]	[illegible]
Toxic Air Contaminant	Acute Inhalation, (ug/m3)	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	[illegible]	[illegible]
Acetaldehyde	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Ammonia @ 10 ppm slip	3.2E+03	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			
Arsenic	1.9E-01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Benzene	1.3E+03	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			
Benzo(a)anthracene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Benzo(a)pyrene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Benzo(b)fluoranthene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Benzo(k)fluoranthene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Beryllium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Bromine & compounds	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
1,3-Butadiene	na	-2.19E-06	-2.75E-07			-2.19E-06	-2.75E-07			-2.19E-06	-2.75E-07			-2.19E-06	-2.75E-07				
Cadmium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Carbon disulfide	6.2E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Chlorine	2.1E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Chloroform	1.5E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Chromium (hexavalent)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Chrysene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Copper	1.0E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Cresols (Note 4)	na	-1.43E-06	-1.81E-07			-1.43E-06	-1.81E-07			-1.43E-06	-1.81E-07			-1.43E-06	-1.81E-07				
Dibenz(a,h)anthracene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Diethanolamine (DEA) (Note 4)	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Ethylbenzene (Note 4)	na	-8.32E-07	-1.05E-07			-8.32E-07	-1.05E-07			-8.32E-07	-1.05E-07			-8.32E-07	-1.05E-07				
Ethylene Dibromide (EDB) (Note 4)	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00				
Formaldehyde	9.4E+01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
n-Hexane	na	-5.24E-06	-6.60E-07			-5.24E-06	-6.60E-07			-5.24E-06	-6.60E-07			-5.24E-06	-6.60E-07				
Hydrogen chloride	2.1E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Hydrogen sulfide	4.2E+01	-2.37E-05	-2.98E-06	-7.11E-08		-2.37E-05	-2.98E-06	-7.11E-08		-2.37E-05	-2.98E-06	-7.11E-08		-2.37E-05	-2.98E-06	-7.11E-08			
Indeno(1,2,3-cd)pyrene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Lead	na		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		
Manganese	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Mercury	1.8E+00		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Methanol	2.8E+04	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			
Methyl tert-Butyl Ether (MTBE) (Note 4)	na	-6.88E-07	-8.67E-08			-6.88E-07	-8.67E-08			-6.88E-07	-8.67E-08			-6.88E-07	-8.67E-08				
Methyl Ethyl Ketone (Note 4)	1.3E+04	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			
Naphthalene	na	-4.88E-06	-6.14E-07			-4.88E-06	-6.14E-07			-4.88E-06	-6.14E-07			-4.88E-06	-6.14E-07				
Nickel	6.0E+00		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Perchloroethylene (Note 4)	2.0E+04	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			
Phenol	5.8E+03	-7.46E-06	-9.40E-07	-1.62E-10		-7.46E-06	-9.40E-07	-1.62E-10		-7.46E-06	-9.40E-07	-1.62E-10		-7.46E-06	-9.40E-07	-1.62E-10			
Phosphorus	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Polychlorinated dioxins/furans	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Propylene (Note 4)	na	-2.34E-04	-2.95E-05			-2.34E-04	-2.95E-05			-2.34E-04	-2.95E-05			-2.34E-04	-2.95E-05				
Selenium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
Styrene	2.1E+04	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			
Sulfuric acid mist	1.2E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			
Toluene	3.7E+04	-1.43E-06	-1.81E-07	-4.88E-12		-1.43E-06	-1.81E-07	-4.88E-12		-1.43E-06	-1.81E-07	-4.88E-12		-1.43E-06	-1.81E-07	-4.88E-12			
Xylenes	2.2E+04	-4.82E-06	-6.07E-07	-2.76E-11		-4.82E-06	-6.07E-07	-2.76E-11		-4.82E-06	-6.07E-07	-2.76E-11		-4.82E-06	-6.07E-07	-2.76E-11			
Zinc	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				
			sum	-7.13E-08	0.00E+00		sum	-7.13E-08	0.00E+00		sum	-7.13E-08	0.00E+00		sum	-7.13E-08	0.00E+00	sum	0.00E+00

Multiple sources with multiple emission points in close pro
(These sources are in close proximity and data are not ava
Chevron recommends that these sources be combined an
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separate
Note 2: 4 Rhen East fuel gas data were reported separate
Note 3: Each SRU and its associated stack heater emit fro
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents co

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Fugitive Toxic Emissions

Source No(s)./Status		S-4473 & S-4474 fugitive New				S-4475 & S-4476 fugitive New				S-4263 fugitive Shutdown				S-4237 fugitive Shutdown				S-4452 fugitive New				S-4253 fugitive Modified			
Description		Cogen 3				Cogen 4				4 Rhen				5 Rhen				CCR				TKC			
Sub-Project		Power Plant Fugitives				Power Plant Fugitives				Reformer Fugitives				Reformer Fugitives				Reformer Fugitives				H2 Purity Fugitives			
Toxic Air Contaminant	Acute Inhalation, (ug/m3)	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Ammonia @ 10 ppm slip	3.2E+03	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	1.9E-01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzene	1.3E+03	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00		-2.24E-02	-2.82E-03	-2.17E-06		-1.88E-02	-2.37E-03	-1.82E-06		4.31E-02	5.44E-03	4.18E-06		5.80E-03	7.30E-04	5.62E-07	
Benzo(a)anthracene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Benzo(a)pyrene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Benzo(b)fluoranthene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Benzo(k)fluoranthene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Beryllium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Bromine & compounds	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
1,3-Butadiene	na	1.43E-04	1.81E-05				0.00E+00			-6.24E-09	-7.87E-10			-6.96E-09	-8.77E-10			1.27E-08	1.60E-09				0.00E+00		
Cadmium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Carbon disulfide	6.2E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine	2.1E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform	1.5E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Chrysene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Copper	1.0E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Cresols (Note 4)	na	1.67E-04	2.10E-05				0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Diethanolamine (DEA) (Note 4)	na	0.00E+00	0.00E+00				0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			5.20E-02	6.55E-03		
Ethylbenzene (Note 4)	na	9.67E-05	1.22E-05				0.00E+00			-1.59E-02	-2.01E-03			-1.34E-02	-1.69E-03			3.07E-02	3.87E-03			8.28E-03	1.04E-03		
Ethylene Dibromide (EDB) (Note 4)	na	0.00E+00	0.00E+00				0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00				0.00E+00		
Formaldehyde	9.4E+01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
n-Hexane	na	3.13E-04	3.95E-05				0.00E+00			-1.05E-02	-1.33E-03			-8.83E-03	-1.11E-03			2.03E-02	2.55E-03			2.29E-02	2.88E-03		
Hydrogen chloride	2.1E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01	1.55E-03	1.96E-04	4.66E-06			0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		-7.54E-08	-9.50E-09	-2.26E-10		1.00E-07	1.26E-08	3.01E-10		1.74E-02	2.19E-03	5.22E-05	
Indeno(1,2,3-cd)pyrene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Lead	na		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00
Manganese	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Mercury	1.8E+00		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methanol	2.8E+04	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na	2.45E-05	3.09E-06				0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	na	5.67E-04	7.14E-05				0.00E+00			-1.46E-03	-1.83E-04			-1.22E-03	-1.54E-04			2.80E-03	3.53E-04			6.64E-03	8.37E-04		
Nickel	6.0E+00		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Perchloroethylene (Note 4)	2.0E+04	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00		-3.11E-05	-3.92E-06	-1.96E-10		-1.28E-05	-1.61E-06	-8.06E-11		7.52E-05	9.47E-06	4.74E-10			0.00E+00	0.00E+00	
Phenol	5.8E+03	8.67E-04	1.09E-04	1.88E-08			0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phosphorus	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Polychlorinated dioxins/furans	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Propylene (Note 4)	na	1.53E-02	1.93E-03				0.00E+00			-1.96E-08	-2.47E-09			-7.44E-07	-9.38E-08			1.00E-06	1.26E-07				0.00E+00		
Selenium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Styrene	2.1E+04	0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00		-5.20E-04	-6.56E-05	-3.12E-09		-4.37E-04	-5.51E-05	-2.62E-09		1.00E-03	1.26E-04	6.02E-09			0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Toluene	3.7E+04	1.67E-04	2.10E-05	5.68E-10			0.00E+00	0.00E+00		-7.70E-02	-9.70E-03	-2.62E-07		-6.47E-02	-8.15E-03	-2.20E-07		1.48E-01	1.87E-02	5.05E-07		3.34E-02	4.21E-03	1.14E-07	
Xylenes	2.2E+04	4.07E-04	5.12E-05	2.33E-09			0.00E+00	0.00E+00		-7.87E-02	-9.91E-03	-4.50E-07		-6.61E-02	-8.33E-03	-3.78E-07		1.52E-01	1.91E-02	8.68E-07		3.75E-02	4.73E-03	2.15E-07	
Zinc	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
			sum	4.68E-06	0.00E+00		sum	0.00E+00	0.00E+00		sum	-2.89E-06	0.00E+00		sum	-2.42E-06	0.00E+00		sum	5.56E-06	0.00E+00		sum	5.30E-05	0.00E+00

Multiple sources with multiple emission points in close pro
(These sources are in close proximity and data are not ava
Chevron recommends that these sources be combined an
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separat
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Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Point Source Toxic Emissions

Source No(s)./Status Description Sub-Project		S-4170 Shutdown F-305 A Train Reformer Furnace Hydrogen Plant Replacement				S-4171 Shutdown F-355 B Train Reformer Furnace Hydrogen Plant Replacement				S-4158 Shutdown F-340 Feed Furnace Hydrogen Plant Replacement				S-4471 New Hyd Plt Train 1 Reformer Furnace Hydrogen Plant Replacement				S-4472 New Hyd Plt Train 2 Reformer Furnace Hydrogen Plant Replacement			
Toxic Air Contaminant	Acute Inhalation (ug/m3)	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s
Acetaldehyde	na	-8.62E-03	-1.09E-03			-7.71E-03	-9.72E-04			-5.09E-04	-6.42E-05			1.45E-02	1.83E-03			1.45E-02	1.83E-03		
Ammonia @ 10 ppm slip	3.2E+03	-2.53E+00	-3.19E-01	-9.96E-05			0.00E+00	0.00E+00			0.00E+00	0.00E+00		4.27E+00	5.38E-01	1.68E-04		4.27E+00	5.38E-01	1.68E-04	
Arsenic	1.9E-01	-4.79E-04	-6.03E-05	-3.17E-04		-4.28E-04	-5.40E-05	-2.84E-04		-2.83E-05	-3.56E-06	-1.88E-05		8.08E-04	1.02E-04	5.36E-04		8.08E-04	1.02E-04	5.36E-04	
Benzene	1.3E+03	-3.64E-02	-4.59E-03	-3.53E-06		-3.26E-02	-4.11E-03	-3.16E-06		-2.15E-03	-2.71E-04	-2.09E-07		6.15E-02	7.74E-03	5.96E-06		6.15E-02	7.74E-03	5.96E-06	
Benzo(a)anthracene	na	-1.81E-05	-2.28E-06			-1.62E-05	-2.04E-06			-1.07E-06	-1.35E-07			3.05E-05	3.84E-06			3.05E-05	3.84E-06		
Benzo(a)pyrene	na	-5.05E-05	-6.36E-06			-4.52E-05	-5.69E-06			-2.98E-06	-3.76E-07			8.51E-05	1.07E-05			8.51E-05	1.07E-05		
Benzo(b)fluoranthene	na	-2.28E-05	-2.87E-06			-2.04E-05	-2.57E-06			-1.34E-06	-1.69E-07			3.84E-05	4.84E-06			3.84E-05	4.84E-06		
Benzo(k)fluoranthene	na	-1.36E-05	-1.71E-06			-1.21E-05	-1.53E-06			-8.02E-07	-1.01E-07			2.29E-05	2.88E-06			2.29E-05	2.88E-06		
Beryllium	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
1,3-Butadiene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Cadmium	na	-5.56E-04	-7.01E-05			-4.96E-04	-6.27E-05			-3.29E-05	-4.14E-06			9.39E-04	1.18E-04			9.39E-04	1.18E-04		
Carbon disulfide	6.2E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine	2.1E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform	1.5E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	na	-9.18E-07	-1.16E-07			-8.21E-07	-1.04E-07			-5.43E-08	-6.84E-09			1.55E-06	1.95E-07			1.55E-06	1.95E-07		
Copper	1.0E+02	-2.37E-03	-2.99E-04	-2.99E-06		-2.12E-03	-2.67E-04	-2.67E-06		-1.40E-04	-1.77E-05	-1.77E-07		4.00E-03	5.04E-04	5.04E-06		4.00E-03	5.04E-04	5.04E-06	
Cresols (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Ethylbenzene (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Formaldehyde	9.4E+01	-6.25E-02	-7.88E-03	-8.38E-05		-5.59E-02	-7.05E-03	-7.50E-05		-3.69E-03	-4.66E-04	-4.95E-06		1.05E-01	1.33E-02	1.41E-04		1.05E-01	1.33E-02	1.41E-04	
n-Hexane	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Hydrogen chloride	2.1E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	na	-5.80E-05	-7.31E-06			-5.19E-05	-6.54E-06			-3.43E-06	-4.32E-07			9.79E-05	1.23E-05			9.79E-05	1.23E-05		
Lead	na	-2.75E-03	-3.47E-04		-3.47E-04	-2.46E-03	-3.11E-04		-3.11E-04	-1.63E-04	-2.05E-05		-2.05E-05	4.65E-03	5.85E-04		5.85E-04	4.65E-03	5.85E-04		5.85E-04
Manganese	na	-3.83E-03	-4.83E-04			-3.43E-03	-4.32E-04			-2.27E-04	-2.86E-05			6.47E-03	8.15E-04			6.47E-03	8.15E-04		
Mercury	1.8E+00	-1.01E-04	-1.28E-05	-7.10E-06		-9.07E-05	-1.14E-05	-6.35E-06		-5.99E-06	-7.55E-07	-4.19E-07		1.71E-04	2.15E-05	1.20E-05		1.71E-04	2.15E-05	1.20E-05	
Methanol	2.8E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		7.57E-05	9.54E-06	3.41E-10		7.57E-05	9.54E-06	3.41E-10	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	na	-1.76E-04	-2.22E-05			-1.58E-04	-1.99E-05			-1.04E-05	-1.31E-06			2.97E-04	3.75E-05			2.97E-04	3.75E-05		
Nickel	6.0E+00	-5.30E-03	-6.68E-04	-1.11E-04		-4.75E-03	-5.98E-04	-9.97E-05		-3.14E-04	-3.95E-05	-6.58E-06		8.95E-03	1.13E-03	1.88E-04		8.95E-03	1.13E-03	1.88E-04	
Perchloroethylene (Note 4)	2.0E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	5.8E+03	-3.17E-03	-3.99E-04	-6.89E-08		-2.84E-03	-3.57E-04	-6.16E-08		-1.87E-04	-2.36E-05	-4.07E-09		5.35E-03	6.74E-04	1.16E-07		5.35E-03	6.74E-04	1.16E-07	
Phosphorus	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Propylene (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Selenium	na	-1.10E-05	-1.39E-06			-9.88E-06	-1.24E-06			-6.52E-07	-8.22E-08			1.86E-05	2.35E-06			1.86E-05	2.35E-06		
Styrene	2.1E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02	-4.53E-02	-5.71E-03	-4.76E-05		-4.06E-02	-5.12E-03	-4.26E-05		-2.68E-03	-3.38E-04	-2.81E-06		5.09E-02	6.41E-03	5.34E-05		5.09E-02	6.41E-03	5.34E-05	
Toluene	3.7E+04	-6.03E-02	-7.59E-03	-2.05E-07		-5.39E-02	-6.79E-03	-1.84E-07		-3.56E-03	-4.49E-04	-1.21E-08		1.02E-01	1.28E-02	3.46E-07		1.02E-01	1.28E-02	3.46E-07	
Xylenes	2.2E+04	-2.10E-02	-2.65E-03	-1.20E-07		-1.88E-02	-2.37E-03	-1.08E-07		-1.24E-03	-1.56E-04	-7.11E-09		3.54E-02	4.46E-03	2.03E-07		3.54E-02	4.46E-03	2.03E-07	
Zinc	na	-1.17E-02	-1.48E-03			-1.05E-02	-1.32E-03			-6.92E-04	-8.72E-05			1.98E-02	2.49E-03			1.98E-02	2.49E-03		
			sum		-6.74E-04	-3.47E-04	sum		-5.14E-04	-3.11E-04	sum		-3.39E-05	-2.05E-05	sum		1.11E-03	5.85E-04	sum		1.11E-03	5.85E-04

Multiple sources with multiple emission points in close proximity.
(These sources are in close proximity and data are not available to split emissions from these sources further.
Chevron recommends that these sources be combined and modeled as one source.
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3550 and F-3560 both emit from 4 Rhen W stack. Total is shown in 4 Rhen W Total column.
Note 2: 4 Rhen East fuel gas data were reported separately for only part of the baseline. Baseline is a combination of combined and split data. F-3570 and F-3580 both emit from 4 Rhen E stack. Total is shown in 4 Rhen E Total column.
Note 3: Each SRU and its associated stack heater emit from a common point. SRU is source for carbon disulfide and sulfuric acid mist. Stack heater is source for all other pollutants.
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents cogen fuel is natural gas, refinery fuel gas and LPG (for other constituents, cogen fuel is natural gas and refinery fuel gas)

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Point Source Toxic Emissions

Source No(s)./Status Description Sub-Project		[redacted]	S-6020 New Flare Pilot/Purge Hydrogen Plant Replacement				S-4129 Shutdown No. 1 Power Plant - 1 Boiler Power Plant Replacement			
Toxic Air Contaminant	Acute Inhalation, (ug/m3)		TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	na		7.17E-03	9.04E-04			-9.80E-04	-1.24E-04		
Ammonia @ 10 ppm slip	3.2E+03			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	1.9E-01		3.98E-04	5.02E-05	2.64E-04		-5.45E-05	-6.86E-06	-3.61E-05	
Benzene	1.3E+03		3.03E-02	3.82E-03	2.94E-06		-4.15E-03	-5.22E-04	-4.02E-07	
Benzo(a)anthracene	na		1.50E-05	1.90E-06			-2.06E-06	-2.59E-07		
Benzo(a)pyrene	na		4.20E-05	5.29E-06			-5.74E-06	-7.23E-07		
Benzo(b)fluoranthene	na		1.89E-05	2.39E-06			-2.59E-06	-3.26E-07		
Benzo(k)fluoranthene	na		1.13E-05	1.42E-06			-1.54E-06	-1.95E-07		
Beryllium	na		0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds	na			0.00E+00				0.00E+00		
1,3-Butadiene	na			0.00E+00				0.00E+00		
Cadmium	na		4.63E-04	5.84E-05			-6.33E-05	-7.98E-06		
Carbon disulfide	6.2E+03			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine	2.1E+02			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform	1.5E+02			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	na		0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	na		7.64E-07	9.63E-08			-1.04E-07	-1.32E-08		
Copper	1.0E+02		1.97E-03	2.49E-04	2.49E-06		-2.70E-04	-3.40E-05	-3.40E-07	
Cresols (Note 4)	na			0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	na		0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na			0.00E+00				0.00E+00		
Ethylbenzene (Note 4)	na			0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)	na			0.00E+00				0.00E+00		
Formaldehyde	9.4E+01		5.20E-02	6.56E-03	6.97E-05		-7.11E-03	-8.96E-04	-9.53E-06	
n-Hexane	na			0.00E+00				0.00E+00		
Hydrogen chloride	2.1E+03			0.00E+08	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	na		4.83E-05	6.08E-06			-6.60E-06	-8.32E-07		
Lead	na		2.29E-03	2.89E-04		2.89E-04	-3.13E-04	-3.95E-05		-3.95E-05
Manganese	na		3.19E-03	4.02E-04			-4.36E-04	-5.50E-05		
Mercury	1.8E+00		8.44E-05	1.06E-05	5.91E-06		-1.15E-05	-1.45E-06	-8.07E-07	
Methanol	2.8E+04			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na			0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	na		1.47E-04	1.85E-05			-2.01E-05	-2.53E-06		
Nickel	6.0E+00		4.42E-03	5.56E-04	9.27E-05		-6.04E-04	-7.61E-05	-1.27E-05	
Perchloroethylene (Note 4)	2.0E+04			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	5.8E+03		2.64E-03	3.33E-04	5.73E-08		-3.61E-04	-4.55E-05	-7.84E-09	
Phosphorus	na		0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans	na			0.00E+00				0.00E+00		
Propylene (Note 4)	na			0.00E+00				0.00E+00		
Selenium	na		9.19E-06	1.16E-06			-1.26E-06	-1.58E-07		
Styrene	2.1E+04			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02		1.40E-03	1.76E-04	1.47E-06		-5.16E-03	-6.50E-04	-5.42E-06	
Toluene	3.7E+04		5.02E-02	6.32E-03	1.71E-07		-6.86E-03	-8.64E-04	-2.33E-08	
Xylenes	2.2E+04		1.75E-02	2.20E-03	1.00E-07		-2.39E-03	-3.01E-04	-1.37E-08	
Zinc	na		9.75E-03	1.23E-03			-1.33E-03	-1.68E-04		
				sum	4.40E-04	2.89E-04		sum	-6.53E-05	-3.95E-05

Source No(s)./Status Description Sub-Project	S-4131 Shutdown No. 1 Power Plant - 3 Boiler Power Plant Replacement				S-4132 Shutdown No. 1 Power Plant - 4 Boiler Power Plant Replacement			
Toxic Air Contaminant	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	-1.42E-03	-1.80E-04			-1.24E-03	-1.56E-04		
Ammonia @ 10 ppm slip		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	-7.91E-05	-9.97E-06	-5.25E-05		-6.87E-05	-8.65E-06	-4.55E-05	
Benzene	-6.02E-03	-7.59E-04	-5.84E-07		-5.23E-03	-6.59E-04	-5.07E-07	
Benzo(a)anthracene	-2.99E-06	-3.77E-07			-2.59E-06	-3.27E-07		
Benzo(a)pyrene	-8.34E-06	-1.05E-06			-7.24E-06	-9.12E-07		
Benzo(b)fluoranthene	-3.76E-06	-4.74E-07			-3.26E-06	-4.11E-07		
Benzo(k)fluoranthene	-2.24E-06	-2.83E-07			-1.95E-06	-2.45E-07		
Beryllium	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds		0.00E+00				0.00E+00		
1,3-Butadiene		0.00E+00				0.00E+00		
Cadmium	-9.20E-05	-1.16E-05			-7.98E-05	1.01E-05		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	-1.52E-07	-1.91E-08			-1.32E-07	-1.66E-08		
Copper	-3.92E-04	-4.94E-05	-4.94E-07		-3.40E-04	-4.29E-05	-4.29E-07	
Cresols (Note 4)		0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00				0.00E+00		
Ethylbenzene (Note 4)		0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)		0.00E+00				0.00E+00		
Formaldehyde	-1.03E-02	-1.30E-03	-1.39E-05		-8.97E-03	-1.13E-03	-1.20E-05	
n-Hexane		0.00E+00				0.00E+00		
Hydrogen chloride		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	-9.59E-06	-1.21E-06			-8.32E-06	-1.05E-06		
Lead	-4.55E-04	-5.74E-05		-5.74E-05	-3.95E-04	-4.98E-05		-4.98E-05
Manganese	-6.34E-04	-7.99E-05			-5.50E-04	-6.93E-05		
Mercury	-1.68E-05	-2.11E-06	-1.17E-06		-1.45E-05	-1.83E-06	-1.02E-06	
Methanol		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	-2.91E-05	-3.67E-06			-2.53E-05	-3.19E-06		
Nickel	-8.77E-04	-1.11E-04	-1.84E-05		-7.61E-04	-9.59E-05	-1.60E-05	
Perchloroethylene (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	-5.24E-04	-6.61E-05	-1.14E-08		-4.55E-04	-5.73E-05	-9.88E-09	
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans		0.00E+00				0.00E+00		
Propylene (Note 4)		0.00E+00				0.00E+00		
Selenium	-1.83E-06	-2.30E-07			-1.58E-06	-2.00E-07		
Styrene		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	-7.50E-03	-9.45E-04	-7.88E-06		-6.51E-03	-8.20E-04	-6.84E-06	
Toluene	-9.96E-03	-1.26E-03	-3.39E-08		-8.65E-03	-1.09E-03	-2.94E-08	
Xylenes	-3.47E-03	-4.38E-04	-1.99E-08		-3.01E-03	-3.80E-04	-1.73E-08	
Zinc	-1.94E-03	-2.44E-04			-1.68E-03	-2.12E-04		
		sum	-9.50E-05	-5.74E-05		sum	-8.24E-05	-4.98E-05

Source No(s)./Status Description Sub-Project	S-4133 Shutdown No. 1 Power Plant - 5 Boiler Power Plant Replacement				S-4135 Shutdown No. 1 Power Plant - 7 Boiler Power Plant Replacement			
Toxic Air Contaminant	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	-1.22E-03	-1.54E-04			-1.40E-03	-1.76E-04		
Ammonia @ 10 ppm slip		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	-6.79E-05	-8.55E-06	-4.50E-05		-7.78E-05	-9.80E-06	-5.16E-05	
Benzene	-5.16E-03	-6.51E-04	-5.01E-07		-5.92E-03	-7.46E-04	-5.74E-07	
Benzo(a)anthracene	-2.56E-06	-3.23E-07			-2.94E-06	-3.70E-07		
Benzo(a)pyrene	-7.15E-06	-9.01E-07			-8.20E-06	-1.03E-06		
Benzo(b)fluoranthene	-3.23E-06	-4.08E-07			-3.70E-06	-4.66E-07		
Benzo(k)fluoranthene	-1.92E-06	-2.42E-07			-2.20E-06	-2.78E-07		
Beryllium	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds		0.00E+00				0.00E+00		
1,3-Butadiene		0.00E+00				0.00E+00		
Cadmium	-7.89E-05	-9.94E-06			-9.04E-05	-1.14E-05		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	-1.30E-07	-1.64E-08			-1.49E-07	-1.88E-08		
Copper	-3.36E-04	-4.23E-05	-4.23E-07		-3.85E-04	-4.85E-05	-4.85E-07	
Cresols (Note 4)		0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00				0.00E+00		
Ethylbenzene (Note 4)		0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)		0.00E+00				0.00E+00		
Formaldehyde	-8.86E-03	-1.12E-03	-1.19E-05		-1.02E-02	-1.28E-03	-1.36E-05	
n-Hexane		0.00E+00				0.00E+00		
Hydrogen chloride		0.00E+00	0.00E+00			0.00E+08	0.00E+00	
Hydrogen sulfide	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	-8.22E-06	-1.04E-06			-9.42E-06	-1.19E-06		
Lead	-3.90E-04	-4.92E-05		-4.92E-05	-4.47E-04	-5.64E-05		-5.64E-05
Manganese	-5.44E-04	-6.85E-05			-6.23E-04	-7.85E-05		
Mercury	-1.44E-05	-1.81E-06	-1.01E-06		-1.65E-05	-2.07E-06	-1.15E-06	
Methanol		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	-2.50E-05	-3.15E-06			-2.86E-05	-3.61E-06		
Nickel	-7.52E-04	-9.47E-05	-1.58E-05		-8.62E-04	-1.09E-04	-1.81E-05	
Perchloroethylene (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	-4.49E-04	-5.66E-05	-9.76E-09		-5.15E-04	-6.49E-05	-1.12E-08	
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans		0.00E+00				0.00E+00		
Propylene (Note 4)		0.00E+00				0.00E+00		
Selenium	-1.56E-06	-1.97E-07			-1.79E-06	-2.26E-07		
Styrene		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	-6.43E-03	-8.10E-04	-6.75E-06		-7.37E-03	-9.29E-04	-7.74E-06	
Toluene	-8.54E-03	-1.08E-03	-2.91E-08		-9.79E-03	-1.23E-03	-3.33E-08	
Xylenes	-2.98E-03	-3.75E-04	-1.71E-08		-3.41E-03	-4.30E-04	-1.95E-08	
Zinc	-1.66E-03	-2.09E-04			-1.90E-03	-2.40E-04		
		sum	-8.14E-05	-4.92E-05		sum	-9.33E-05	-5.64E-05

Multiple sources with multiple emission points in close pr
(These sources are in close proximity and data are not av
Chevron recommends that these sources be combined a
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separa
Note 2: 4 Rhen East fuel gas data were reported separat
Note 3: Each SRU and its associated stack heater emit fr
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents c

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Point Source Toxic Emissions

Source No(s)./Status / Description / Sub-Project		[illegible]	[illegible]	S-4473 & S-4474 New No. 1 Power Plant - Cogen 3 Power Plant Replacement				[illegible]	[illegible]	[illegible]	[illegible]
Toxic Air Contaminant	Acute Inhalation, (ug/m3)	[illegible]	[illegible]	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	[illegible]	[illegible]	[illegible]	[illegible]
Acetaldehyde	na	[illegible]	[illegible]	3.53E-03	4.45E-04			[illegible]	[illegible]	[illegible]	[illegible]
Ammonia @ 10 ppm slip	3.2E+03	[illegible]	[illegible]	1.17E+01	1.48E+00	4.61E-04		[illegible]	[illegible]	[illegible]	[illegible]
Arsenic	1.9E-01	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Benzene	1.3E+03	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)anthracene	na	[illegible]	[illegible]	1.28E-05	1.61E-06			[illegible]	[illegible]	[illegible]	[illegible]
Benzo(a)pyrene	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Benzo(b)fluoranthene	na	[illegible]	[illegible]	2.15E-05	2.71E-06			[illegible]	[illegible]	[illegible]	[illegible]
Benzo(k)fluoranthene	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Beryllium	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Bromine & compounds	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
1,3-Butadiene	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Cadmium	na	[illegible]	[illegible]	3.35E-03	4.22E-04			[illegible]	[illegible]	[illegible]	[illegible]
Carbon disulfide	6.2E+03	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Chlorine	2.1E+02	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Chloroform	1.5E+02	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Chromium (hexavalent)	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Chrysene	na	[illegible]	[illegible]	9.20E-05	1.16E-05			[illegible]	[illegible]	[illegible]	[illegible]
Copper	1.0E+02	[illegible]	[illegible]	1.84E-02	2.32E-03	2.32E-05		[illegible]	[illegible]	[illegible]	[illegible]
Cresols (Note 4)	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Dibenz(a,h)anthracene	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Diethanolamine (DEA) (Note 4)	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Ethylbenzene (Note 4)	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Ethylene Dibromide (EDB) (Note 4)	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Formaldehyde	9.4E+01	[illegible]	[illegible]	1.32E-01	1.67E-02	1.78E-04		[illegible]	[illegible]	[illegible]	[illegible]
n-Hexane	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen chloride	2.1E+03	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen sulfide	4.2E+01	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Indeno(1,2,3-cd)pyrene	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Lead	na	[illegible]	[illegible]	0.00E+00	0.00E+00		0.00E+00	[illegible]	[illegible]	[illegible]	[illegible]
Manganese	na	[illegible]	[illegible]	7.92E-02	9.98E-03			[illegible]	[illegible]	[illegible]	[illegible]
Mercury	1.8E+00	[illegible]	[illegible]	3.74E-03	4.71E-04	2.62E-04		[illegible]	[illegible]	[illegible]	[illegible]
Methanol	2.8E+04	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Methyl tert-Butyl Ether (MTBE) (Note 4)	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Methyl Ethyl Ketone (Note 4)	1.3E+04	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Naphthalene	na	[illegible]	[illegible]	3.22E-02	4.05E-03			[illegible]	[illegible]	[illegible]	[illegible]
Nickel	6.0E+00	[illegible]	[illegible]	1.26E-01	1.58E-02	2.64E-03		[illegible]	[illegible]	[illegible]	[illegible]
Perchloroethylene (Note 4)	2.0E+04	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Phenol	5.8E+03	[illegible]	[illegible]	2.62E-02	3.30E-03	5.70E-07		[illegible]	[illegible]	[illegible]	[illegible]
Phosphorus	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Polychlorinated dioxins/furans	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Propylene (Note 4)	na	[illegible]	[illegible]		0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Selenium	na	[illegible]	[illegible]	0.00E+00	0.00E+00			[illegible]	[illegible]	[illegible]	[illegible]
Styrene	2.1E+04	[illegible]	[illegible]		0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Sulfuric acid mist	1.2E+02	[illegible]	[illegible]	1.98E+01	2.49E+00	2.08E-02		[illegible]	[illegible]	[illegible]	[illegible]
Toluene	3.7E+04	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Xylenes	2.2E+04	[illegible]	[illegible]	0.00E+00	0.00E+00	0.00E+00		[illegible]	[illegible]	[illegible]	[illegible]
Zinc	na	[illegible]	[illegible]	1.86E-01	2.34E-02			[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]		sum	2.44E-02	0.00E+00	[illegible]	[illegible]	[illegible]	[illegible]

Multiple sources with multiple emission points in close pr
(These sources are in close proximity and data are not av
Chevron recommends that these sources be combined ar
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separa
Note 2: 4 Rhen East fuel gas data were reported separat
Note 3: Each SRU and its associated stack heater emit i
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents c

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Point Source Toxic Emissions

Source No(s)./Status Description Sub-Project		S-4038 & S-4039 Shutdown Note 1 4 Rhen W (F-3550 & F-3560) Total Reformer Replacement			
Toxic Air Contaminant	Acute Inhalation, (ug/m3)	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	na	-2.98E-03	-3.75E-04		
Ammonia @ 10 ppm slip	3.2E+03		0.00E+00	0.00E+00	
Arsenic	1.9E-01	-1.66E-04	-2.09E-05	-1.10E-04	
Benzene	1.3E+03	-1.26E-02	-1.59E-03	-1.22E-06	
Benzo(a)anthracene	na	-6.25E-06	-7.88E-07		
Benzo(a)pyrene	na	-1.74E-05	-2.20E-06		
Benzo(b)fluoranthene	na	-7.87E-06	-9.91E-07		
Benzo(k)fluoranthene	na	-4.69E-06	-5.91E-07		
Beryllium	na	0.00E+00	0.00E+00		
Bromine & compounds	na		0.00E+00		
1,3-Butadiene	na		0.00E+00		
Cadmium	na	-1.92E-04	-2.42E-05		
Carbon disulfide	6.2E+03		0.00E+00	0.00E+00	
Chlorine	2.1E+02		0.00E+00	0.00E+00	
Chloroform	1.5E+02		0.00E+00	0.00E+00	
Chromium (hexavalent)	na	0.00E+00	0.00E+00		
Chrysene	na	-3.17E-07	-4.00E-08		
Copper	1.0E+02	-8.20E-04	-1.03E-04	-1.03E-06	
Cresols (Note 4)	na		0.00E+00		
Dibenz(a,h)anthracene	na	0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na		0.00E+00		
Ethylbenzene (Note 4)	na		0.00E+00		
Ethylene Dibromide (EDB) (Note 4)	na		0.00E+00		
Formaldehyde	9.4E+01	-2.16E-02	-2.72E-03	-2.90E-05	
n-Hexane	na		0.00E+00		
Hydrogen chloride	2.1E+03		0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01	0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	na	-2.01E-05	-2.53E-06		
Lead	na	-9.52E-04	-1.20E-04		-1.20E-04
Manganese	na	-1.33E-03	-1.67E-04		
Mercury	1.8E+00	-3.51E-05	-4.42E-06	-2.45E-06	
Methanol	2.8E+04		0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na		0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04		0.00E+00	0.00E+00	
Naphthalene	na	-6.10E-05	-7.68E-06		
Nickel	6.0E+00	-1.83E-03	-2.31E-04	-3.85E-05	
Perchloroethylene (Note 4)	2.0E+04		0.00E+00	0.00E+00	
Phenol	5.8E+03	-1.10E-03	-1.38E-04	-2.38E-08	
Phosphorus	na	0.00E+00	0.00E+00		
Polychlorinated dioxins/furans	na		0.00E+00		
Propylene (Note 4)	na		0.00E+00		
Selenium	na	-3.82E-06	-4.81E-07		
Styrene	2.1E+04		0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02	-1.57E-02	-1.98E-03	-1.65E-05	
Toluene	3.7E+04	-2.08E-02	-2.63E-03	-7.10E-08	
Xylenes	2.2E+04	-7.26E-03	-9.15E-04	-4.16E-08	
Zinc	na	-4.05E-03	-5.10E-04		
			sum	-1.99E-04	-1.20E-04

S-4040 Shutdown Note 2 F-3570 Reformer Replacement	S-4041 Shutdown Note 2 [illegible] Reformer Replacement	Shutdown Note 2 4 Rhen E Combined Reformer Replacement
[illegible]	[illegible]	[illegible]

Toxic Air Contaminant	S-4040 & S-4041 Shutdown Note 2 4 Rhen E (F-3570 & F-3580) Total Reformer Replacement TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	S-4044 & S-4045 Shutdown 5 Rhen E Furnaces F-570 & F-580 Reformer Replacement TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	-1.25E-03	-1.58E-04			-1.75E-03	-2.21E-04		
Ammonia @ 10 ppm slip		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	-6.96E-05	-8.77E-06	-4.62E-05		-9.72E-05	-1.23E-05	-6.45E-05	
Benzene	-5.30E-03	-6.68E-04	-5.14E-07		-7.40E-03	-9.32E-04	-7.17E-07	
Benzo(a)anthracene	-2.63E-06	-3.31E-07			-3.67E-06	-4.63E-07		
Benzo(a)pyrene	-7.34E-06	-9.25E-07			-1.02E-05	-1.29E-06		
Benzo(b)fluoranthene	-3.31E-06	-4.17E-07			-4.62E-06	-5.82E-07		
Benzo(k)fluoranthene	-1.97E-06	-2.49E-07			-2.76E-06	-3.47E-07		
Beryllium	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds		0.00E+00				0.00E+00		
1,3-Butadiene		0.00E+00				0.00E+00		
Cadmium	-8.09E-05	-1.02E-05			-1.13E-04	-1.42E-05		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	-1.33E-07	-1.68E-08			-1.86E-07	-2.35E-08		
Copper	-3.45E-04	-4.34E-05	-4.34E-07		-4.82E-04	-6.07E-05	-6.07E-07	
Cresols (Note 4)		0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00				0.00E+00		
Ethylbenzene (Note 4)		0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)		0.00E+00				0.00E+00		
Formaldehyde	-9.09E-03	-1.15E-03	-1.22E-05		-1.27E-02	-1.60E-03	-1.70E-05	
n-Hexane		0.00E+00				0.00E+00		
Hydrogen chloride		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	-8.44E-06	-1.06E-06			-1.18E-05	-1.48E-06		
Lead	-4.00E-04	-5.05E-05		-5.05E-05	-5.59E-04	-7.05E-05		-7.05E-05
Manganese	-5.58E-04	-7.03E-05			-7.79E-04	-9.81E-05		
Mercury	-1.47E-05	-1.86E-06	-1.03E-06		-2.06E-05	-2.59E-06	-1.44E-06	
Methanol		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	-2.56E-05	-3.23E-06			-3.58E-05	-4.51E-06		
Nickel	-7.71E-04	-9.72E-05	-1.62E-05		-1.08E-03	-1.36E-04	-2.26E-05	
Perchloroethylene (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	-4.61E-04	-5.81E-05	-1.00E-08		-6.44E-04	-8.11E-05	-1.40E-08	
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans		0.00E+00				0.00E+00		
Propylene (Note 4)		0.00E+00				0.00E+00		
Selenium	-1.61E-06	-2.02E-07			-2.24E-06	-2.82E-07		
Styrene		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	-6.60E-03	-8.32E-04	-6.93E-06		-9.18E-03	-1.16E-03	-9.64E-06	
Toluene	-8.76E-03	-1.10E-03	-2.98E-08		-1.22E-02	-1.54E-03	-4.17E-08	
Xylenes	-3.05E-03	-3.85E-04	-1.75E-08		-4.27E-03	-5.38E-04	-2.44E-08	
Zinc	-1.70E-03	-2.15E-04			-2.38E-03	-3.00E-04		
		sum	-8.35E-05	-5.05E-05		sum	-1.17E-04	-7.05E-05

Toxic Air Contaminant	S-4042 & S-4043 Shutdown 5 Rhen W Furnaces F-550 & F-560 Reformer Replacement TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	S-4477, S-4478, S-4479 & S-4480 New CCR Furnaces Reformer Replacement TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	-1.75E-03	-2.21E-04			1.54E-02	1.94E-03		
Ammonia @ 10 ppm slip		0.00E+00	0.00E+00		4.51E+00	5.69E-01	1.78E-04	
Arsenic	-9.72E-05	-1.23E-05	-6.45E-05		8.54E-04	1.08E-04	5.67E-04	
Benzene	-7.40E-03	-9.32E-04	-7.17E-07		6.50E-02	8.19E-03	6.30E-06	
Benzo(a)anthracene	-3.67E-06	-4.63E-07			3.23E-05	4.06E-06		
Benzo(a)pyrene	-1.02E-05	-1.29E-06			9.00E-05	1.13E-05		
Benzo(b)fluoranthene	-4.62E-06	-5.82E-07			4.06E-05	5.12E-06		
Benzo(k)fluoranthene	-2.76E-06	-3.47E-07			2.42E-05	3.05E-06		
Beryllium	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds		0.00E+00				0.00E+00		
1,3-Butadiene		0.00E+00				0.00E+00		
Cadmium	-1.13E-04	-1.42E-05			9.93E-04	1.25E-04		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	-1.86E-07	-2.35E-08			1.64E-06	2.06E-07		
Copper	-4.82E-04	-6.07E-05	-6.07E-07		4.23E-03	5.33E-04	5.33E-06	
Cresols (Note 4)		0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00				0.00E+00		
Ethylbenzene (Note 4)		0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)		0.00E+00				0.00E+00		
Formaldehyde	-1.27E-02	-1.60E-03	-1.70E-05		1.12E-01	1.41E-02	1.50E-04	
n-Hexane		0.00E+00				0.00E+00		
Hydrogen chloride		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	-1.18E-05	-1.48E-06			1.04E-04	1.30E-05		
Lead	-5.59E-04	-7.05E-05		-7.05E-05	4.91E-03	6.19E-04		6.19E-04
Manganese	-7.79E-04	-9.81E-05			6.84E-03	8.62E-04		
Mercury	-2.06E-05	-2.59E-06	-1.44E-06		1.81E-04	2.28E-05	1.27E-05	
Methanol		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	-3.58E-05	-4.51E-06			3.15E-04	3.96E-05		
Nickel	-1.08E-03	-1.36E-04	-2.26E-05		9.47E-03	1.19E-03	1.99E-04	
Perchloroethylene (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	-6.44E-04	-8.11E-05	-1.40E-08		5.66E-03	7.13E-04	1.23E-07	
Phosphorus	0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans		0.00E+00				0.00E+00		
Propylene (Note 4)		0.00E+00				0.00E+00		
Selenium	-2.24E-06	-2.82E-07			1.97E-05	2.48E-06		
Styrene		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	-9.18E-03	-1.16E-03	-9.64E-06		2.60E+00	3.28E-01	2.73E-03	
Toluene	-1.22E-02	-1.54E-03	-4.17E-08		1.08E-01	1.35E-02	3.66E-07	
Xylenes	-4.27E-03	-5.38E-04	-2.44E-08		3.75E-02	4.72E-03	2.15E-07	
Zinc	-2.38E-03	-3.00E-04			2.09E-02	2.63E-03		
		sum	-1.17E-04	-7.05E-05		sum	3.85E-03	6.19E-04

Multiple sources with multiple emission points in close pr
(These sources are in close proximity and data are not av
Chevron recommends that these sources be combined a
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separ
Note 2: 4 Rhen East fuel gas data were reported separat
Note 3: Each SRU and its associated stack heater emit t
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents c

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Point Source Toxic Emissions

Source No(s)./Status
Description
Sub-Project

[redacted]

Toxic Air Contaminant	Acute Inhalation, (ug/m3)	S-4227 & S-4192 Modified Note 3 1 SRU & Stack Heater Hydrogen Purity				S-4228 & S-4193 Modified Note 3 2 SRU & Stack Heater Hydrogen Purity				S-4229 & S-4194 Modified Note 3 3 SRU & Stack Heater Hydrogen Purity			
		TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde	na	4.96E-04	6.25E-05			4.75E-04	5.98E-05			9.04E-04	1.14E-04		
Ammonia @ 10 ppm slip	3.2E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	1.9E-01	2.75E-05	3.47E-06	1.83E-05		2.64E-05	3.32E-06	1.75E-05		5.02E-05	6.33E-06	3.33E-05	
Benzene	1.3E+03	2.10E-03	2.64E-04	2.03E-07		2.01E-03	2.53E-04	1.95E-07		3.82E-03	4.81E-04	3.70E-07	
Benzo(a)anthracene	na	1.04E-06	1.31E-07			9.96E-07	1.25E-07			1.90E-06	2.39E-07		
Benzo(a)pyrene	na	2.90E-06	3.66E-07			2.78E-06	3.50E-07			5.29E-06	6.67E-07		
Benzo(b)fluoranthene	na	1.31E-06	1.65E-07			1.25E-06	1.58E-07			2.39E-06	3.01E-07		
Benzo(k)fluoranthene	na	7.81E-07	9.84E-08			7.48E-07	9.42E-08			1.42E-06	1.79E-07		
Beryllium	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Bromine & compounds	na		0.00E+00				0.00E+00				0.00E+00		
1,3-Butadiene	na		0.00E+00				0.00E+00				0.00E+00		
Cadmium	na	3.20E-05	4.03E-06			3.07E-05	3.86E-06			5.84E-05	7.35E-06		
Carbon disulfide	6.2E+03	4.26E-02	5.36E-03	8.65E-07		1.63E-02	2.05E-03	3.31E-07		6.49E-02	8.18E-03	1.32E-06	
Chlorine	2.1E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform	1.5E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Chrysene	na	5.28E-08	6.66E-09			5.06E-08	6.37E-09			9.63E-08	1.21E-08		
Copper	1.0E+02	1.36E-04	1.72E-05	1.72E-07		1.31E-04	1.65E-05	1.65E-07		2.49E-04	3.13E-05	3.13E-07	
Cresols (Note 4)	na		0.00E+00				0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Diethanolamine (DEA) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00		
Ethylbenzene (Note 4)	ne		0.00E+00				0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00		
Formaldehyde	9.4E+01	3.60E-03	4.53E-04	4.82E-06		3.44E-03	4.34E-04	4.62E-06		6.56E-03	8.26E-04	8.79E-08	
n-Hexane	na		0.00E+00				0.00E+00				0.00E+00		
Hydrogen chloride	2.1E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene	na	3.34E-06	4.21E-07			3.20E-06	4.03E-07			6.08E-06	7.66E-07		
Lead	na	1.58E-04	2.00E-05		2.00E-05	1.52E-04	1.91E-05		1.91E-05	2.89E-04	3.64E-05		3.64E-05
Manganese	na	2.21E-04	2.78E-05			2.11E-04	2.66E-05			4.02E-04	5.07E-05		
Mercury	1.8E+00	5.83E-06	7.35E-07	4.08E-07		5.58E-06	7.04E-07	3.91E-07		1.06E-05	1.34E-06	7.44E-07	
Methanol	2.8E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	na	1.01E-05	1.28E-06			9.71E-06	1.22E-06			1.85E-05	2.33E-06		
Nickel	6.0E+00	3.05E-04	3.85E-05	6.41E-06		2.92E-04	3.68E-05	6.14E-06		5.56E-04	7.01E-05	1.17E-05	
Perchloroethylene (Note 4)	2.0E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	5.8E+03	1.82E-04	2.30E-05	3.96E-09		1.75E-04	2.20E-05	3.79E-09		3.33E-04	4.19E-05	7.22E-09	
Phosphorus	na	0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		
Polychlorinated dioxins/furans	na		0.00E+00				0.00E+00				0.00E+00		
Propylene (Note 4)	na		0.00E+00				0.00E+00				0.00E+00		
Selenium	na	6.35E-07	8.00E-08			6.08E-07	7.66E-08			1.16E-06	1.46E-07		
Styrene	2.1E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02	-1.63E+00	-2.05E-01	-1.71E-03		-1.43E+00	-1.80E-01	-1.50E-03		-7.79E-02	-9.82E-03	-8.18E-05	
Toluene	3.7E+04	3.47E-03	4.37E-04	1.18E-08		3.32E-03	4.18E-04	1.13E-08		6.32E-03	7.96E-04	2.15E-08	
Xylenes	2.2E+04	1.21E-03	1.52E-04	6.92E-09		1.16E-03	1.46E-04	6.63E-09		2.20E-03	2.78E-04	1.26E-08	
Zinc	na	6.74E-04	8.49E-05			6.45E-04	8.13E-05			1.23E-03	1.55E-04		
			sum	-1.68E-03	2.00E-05		sum	-1.47E-03	1.91E-05		sum	-2.53E-05	3.64E-05

[redacted]

Toxic Air Contaminant	S-4465 New Hyd Plt Cooling Tower				S-4283 Shutdown 4 Rhen Regen Vent			
	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute HI Model Input (1)	Lead, g/s
Acetaldehyde		0.00E+00				0.00E+00		
Ammonia @ 10 ppm slip		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzene		0.00E+00	0.00E+00		-7.24E-04	-9.12E-05	-7.02E-08	
Benzo(a)anthracene		0.00E+00				0.00E+00		
Benzo(a)pyrene		0.00E+00				0.00E+00		
Benzo(b)fluoranthene		0.00E+00				0.00E+00		
Benzo(k)fluoranthene		0.00E+00				0.00E+00		
Beryllium		0.00E+00				0.00E+00		
Bromine & compounds	1.30E-04	1.63E-05				0.00E+00		
1,3-Butadiene		0.00E+00				0.00E+00		
Cadmium		0.00E+00				0.00E+00		
Carbon disulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine	5.83E-05	7.35E-06	3.50E-08		-2.51E-02	-3.16E-03	-1.50E-05	
Chloroform	4.37E-03	5.51E-04	3.67E-06			0.00E+00	0.00E+00	
Chromium (hexavalent)		0.00E+00				0.00E+00		
Chrysene		0.00E+00				0.00E+00		
Copper		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Cresols (Note 4)		0.00E+00				0.00E+00		
Dibenz(a,h)anthracene		0.00E+00				0.00E+00		
Diethanolamine (DEA) (Note 4)		0.00E+00				0.00E+00		
Ethylbenzene (Note 4)		0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)		0.00E+00				0.00E+00		
Formaldehyde		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
n-Hexane		0.00E+00				0.00E+00		
Hydrogen chloride		0.00E+00	0.00E+00		-3.49E-01	-4.39E-02	-2.09E-05	
Hydrogen sulfide		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Indeno(1,2,3-cd)pyrene		0.00E+00				0.00E+00		
Lead		0.00E+00		0.00E+00		0.00E+00		0.00E+00
Manganese		0.00E+00				0.00E+00		
Mercury		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methanol		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)		0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene		0.00E+00				0.00E+00		
Nickel		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Perchloroethylene (Note 4)		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phosphorus		0.00E+00				0.00E+00		
Polychlorinated dioxins/furans		0.00E+00			-3.71E-12	-4.67E-13		
Propylene (Note 4)		0.00E+00				0.00E+00		
Selenium		0.00E+00				0.00E+00		
Styrene		0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist		0.00E+00	0.00E+00		-1.05E-04	-1.32E-05	-1.10E-07	
Toluene		0.00E+00	0.00E+00		-1.48E-02	-1.86E-03	-5.04E-08	
Xylenes		0.00E+00	0.00E+00		-1.14E-02	-1.43E-03	-6.51E-08	
Zinc		0.00E+00				0.00E+00		
		sum	3.71E-06	0.00E+00		sum	-3.63E-05	0.00E+00

Multiple sources with multiple emission points in close pr
(These sources are in close proximity and data are not av
Chevron recommends thet these sources be combined a
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separa
Note 2: 4 Rhen East fuel gas data were reported separat
Note 3: Each SRU and its associated stack heater emit f
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents c

Attachment AQ-12B
Chevron Refinery Renewal Project
Hourly Point Source Toxic Emissions

Source No(s)./Status		S-4237 Shutdown				S-4452 New				S-4250 Shutdown				S-4250 Shutdown				S-4250 Shutdown				S-4250 Shutdown				S-4249 New				S-4396 Modified			
Description		5 Rhen Regen Vent				CCR Regen Vent				A Train CO2 Vent				B Train CO2 Vent				A Train Deaearator Vent				B Train Deaearator Vent				Deaerator Vent				Sulfur Loading Rack			
Sub-Project																																	
Toxic Air Contaminant	Acute Inhalation, (ug/m3)	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s	TAC Emissions, lbs/hr	TAC Emissions, g/s	Acute Hi Model Input (1)	Lead, g/s
Acetaldehyde	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Ammonia @ 10 ppm slip	3.2E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Arsenic	1.9E-01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzene	1.3E+03	-7.74E-04	-9.75E-05	-7.50E-08		2.81E-03	3.54E-04	2.72E-07			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Benzo(a)anthracene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Benzo(a)pyrene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Benzo(b)fluoranthene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Benzo(k)fluoranthene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Beryllium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Bromine & compounds	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
1,3-Butadiene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Cadmium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Carbon disulfide	6.2E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chlorine	2.1E+02	-2.68E-02	-3.38E-03	-1.61E-05		1.95E-01	2.45E-02	1.17E-04			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chloroform	1.5E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Chromium (hexavalent)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Chrysene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Copper	1.0E+02		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Cresols (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Dibenz(a,h)anthracene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Diethanolamine (DEA) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Ethylbenzene (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Ethylene Dibromide (EDB) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Formaldehyde	9.4E+01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
n-Hexane	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Hydrogen chloride	2.1E+03	-3.73E-01	-4.70E-02	-2.24E-05		1.35E+00	1.70E-01	8.12E-05			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Hydrogen sulfide	4.2E+01		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00		3.67E-02	4.62E-03	1.10E-04	
Indeno(1,2,3-cd)pyrene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Lead	na		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00		0.00E+00
Manganese	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Mercury	1.8E+00		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methanol	2.8E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00		-1.25E+00	-1.58E-01	-5.64E-06		-1.25E+00	-1.58E-01	-5.64E-06		-2.18E-02	-2.75E-03	-9.82E-08		-2.18E-02	-2.75E-03	-9.82E-08		0.00E+00	0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Methyl tert-Butyl Ether (MTBE) (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Methyl Ethyl Ketone (Note 4)	1.3E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Naphthalene	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Nickel	6.0E+00		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Perchloroethylene (Note 4)	2.0E+04		0.00E+00	0.00E+00		1.16E-02	1.46E-03	7.28E-08			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phenol	5.8E+03		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Phosphorus	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Polychlorinated dioxins/furans	na	-3.71E-12	-4.67E-13			5.12E-09	6.45E-10				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Propylene (Note 4)	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Selenium	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
Styrene	2.1E+04		0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Sulfuric acid mist	1.2E+02	-1.05E-04	-1.32E-05	-1.10E-07		6.29E-02	7.93E-03	6.60E-05			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Toluene	3.7E+04	-1.58E-02	-1.99E-03	-5.39E-08		5.74E-02	7.23E-03	1.95E-07			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Xylenes	2.2E+04	-1.22E-02	-1.53E-03	-6.96E-08		4.41E-02	5.56E-03	2.53E-07			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00			0.00E+00	0.00E+00	
Zinc	na		0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00				0.00E+00		
			sum	-3.88E-05	0.00E+00		sum	2.65E-04	0.00E+00		sum	-5.64E-06	0.00E+00		sum	-5.64E-06	0.00E+00		sum	-9.82E-08	0.00E+00		sum	-9.82E-08	0.00E+00		sum	0.00E+00	0.00E+00		sum	1.10E-04	0.00E+00

Multiple sources with multiple emission points in close pr
(These sources are in close proximity and data are not in
Chevron recommends that these sources be combined ar
Calculations have been done on this basis.

Note 1: 4 Rhen West fuel gas data were reported separa
Note 2: 4 Rhen East fuel gas data were reported separat
Note 3: Each SRU and its associated stack heater emit f
Note 4: Chemical emitted as fugitive emissions only
Note 5: Per the EERC document, for these constituents c

Chevron Richmond Power Plant Replacement Project
07-SPPE-1
DATA REQUEST RESPONSE SET 1B

Technical Area: Biological Resources
Author: Heather Blair

BACKGROUND

Section 8.2.5.2, Discussion of Impacts, refers to Section 8.1, Air Quality, for a discussion of impacts to soils and vegetation from cooling tower drift and combustion turbine emissions. However, this information is not presented in the Air Quality section and is needed for a complete analysis.

DATA REQUEST

19. Please provide the aforementioned discussion of impacts to soils and vegetation from cooling tower drift and combustion turbine emissions.

Response: The previous response submitted in Data Request Response Set 1A to this data request briefly discussed the combustion turbine's impacts on soils and vegetation. The following response more fully addresses these impacts.

The area surrounding the PPRP is a built environment, with industrial and residential areas in the area. The refinery is on a peninsula, surrounded by bay waters. No significant vegetation communities exist in the project area and no agricultural crops are grown in the area.

Two airborne pollutants, sulfur dioxide and nitrogen oxides, are the major pollutants of concern that will be found in the project's air emissions. The extent of their effect on soils and vegetation will be directly related to a variety of factors, including wind speed, direction and frequency, air temperature, humidity, the geomorphology of the area, and the location of the proposed project in relation to sensitive plant communities in the zone of impact. The Renewal project on a whole is expected to have a net decrease in emissions of sulfur dioxide, particulate matter, and nitrogen oxides (see Table AQ-14 above).

Sulfur dioxide tends to convert to sulfite and sulfate during chemical transformation in soils. Interpretation of the results of investigations published to date has engendered considerable controversy due to the complexity of terrestrial ecosystems. However, the effects of acidified precipitation containing sulfate (SO^4) on terrestrial ecosystems have been investigated with respect to alteration of soil chemistry as it relates to vegetation health. High levels of SO^4 may induce reduction of the soil pH, decrease the availability of certain essential nutrients, and increase the concentrations of soluble aluminum, which reduces plant growth.

In soils where nitrate-nitrogen is not limiting plant growth, excess nitrate may percolate through the soil column; carrying base cations and exerting an acidifying effect. Increased atmospheric contributions of nitrate may influence vegetation in a species-specific way, with some species taking advantage of its fertilizing characteristics while others (such as those occurring in nitrogen-limited soils) are adversely affected.

Sulfur is a major plant nutrient and can be directly absorbed into the soil. Therefore, an increase in SO_2 in the soil (particularly at levels below threshold limits) would not be expected to have an adverse effect on vegetation.

Sulfur dioxide can affect vegetation directly (as a gas) or indirectly by means of its principal reaction product, sulfate (e.g., acidification of soils). In addition, a third mechanism of impact is the formation of acid mist. Direct effects of injury can be manifested as foliar necrosis, decreased rates of growth or yield, predisposition to disease and reduced reproductive capacity.

Environmental factors such as temperature, light, humidity and wind speed influence both the rate of gas absorption and the plant physiological response to absorbed quantities. The higher the humidity, the higher the absorption of gases. Exposure duration and frequency are also important factors that determine the extent of injuries.

Guidelines for air emission impact assessment provided in the technical literature are diverse and threshold dosages required to cause injury are extremely variable. This is due to the variety of factors affecting plant responses to phytotoxic gases. Consequently, in cases where emissions are below lower threshold limits, decreased yields can result in the absence of visible injury (Sprugel et al. 1980) and long-term impacts should be addressed.

Among the different published attempts to define sulfur dioxide thresholds for vegetation effects, two represent worst-case situations. Loucks et al. (1980) presented threshold ranges between 131 $\mu g/m^3$ and 262 $\mu g/m^3$. McLaughlin (1981) suggests values of 1310 $\mu g/m^3$ in 1-hour average and 786 $\mu g/m^3$ for 3-hour average.

According to the dose-injury curve for SO_2-sensitive plant species provided by the USFWS (1978), the lowest 3-hour concentration expected to cause injury to plants is approximately 390 $\mu g/m^3$, which is over 300 times higher than the projected impacts from the PPRP of 1.1 $\mu g/m^3$. However, these predicted values are applicable only when plants are growing under both the most sensitive environmental conditions and stage of maturity. Thresholds for chronic plant injury by SO_2 have been estimated at about 130 $\mu g/m^3$ on an annual average (USFWS 1978). The maximum annual average air concentration estimated for this project (0.2 $\mu g/m^3$) is more than 500 times below the USFWS threshold for chronic exposure, and the worst-case PPRP 3-hour maximum SO_2 impact of 1.1 $\mu g/m3$ is more than 700 times below the McLaughlin protection level of 786 $\mu g/m^3$. Consequently, the PPRP projected SO_2 impacts are not expected to cause visible foliar injury or significant adverse chronic effects.

Nitrogen dioxide is potentially phytotoxic, but generally at exposures considerably higher than those resulting from most industrial emissions. Exposures for several weeks at concentrations of 280 to 490 $\mu g/m^3$ can cause decreases in dry weight and leaf area, and 1-hour exposures of at least 18,000 $\mu g/m^3$ are required to cause leaf damage. The predicted maximum hourly NO_X impacts for the PPRP is 25 $\mu g/m_3$, which is over ten times below these threshold limits (280 $\mu g/m^3$). This indicates that NO_X emissions from

the project, when considered in the absence of other air pollutants, would not adversely affect vegetation.

Studies performed by Lerman and Darley (1975) concluded that particulate deposition rates of 365 grams per square meter per year ($g/m^2/year$) caused damage to fir trees, but rates of 274 $g/m^2/year$ and 400 to 600 $g/m^2/year$ did not cause damage to vegetation at other sites. Pahwa and Shipley (1979) exposed vegetation (corn, tobacco, and soybeans) to varying salt deposition rates to particulate matter deposition from cooling towers that use saltwater (20 to 25 parts per thousand) in the circulation water. Symptoms of stress on the most sensitive crop plants (soybeans) were barely perceptible effects at a deposition rate of 2.98 $g/m^2/year$ (Pawha and Shipley, 1979). The PPRP project's maximum annual PM_{10} impact is 1.4 $\mu g/m^3$ (which translates into 0.88 $g/m^2/year$). Therefore, PPRP's combustion turbine air emissions are not expected to impact area soils or vegetation.

References

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McLauglin, S.B. 1981. Sulfur dioxide, vegetation effects, and the air quality standard: limits of interpretation and application. SP38, the Proposed Sulfur Dioxide and Particulate Standard Specialty Conference. September 1980, Atlanta. Air Pollution Control Association.

Sprugel, D.G., J.E. Miller, R.M. Miller, et al. 1980. Sulfur dioxide effects on yield and seed quality in field-grown soybeans. Phytopathology 70 (12): 1129-1133.

USEPA. 1991. Air Quality Criteria for Oxides of Nitrogen. Office of Research and Development.

USFWS (United States. Fish and Wildlife Service). 1978. Impacts of Coal-Fired Power Plants on Fish, Wildlife, and their Habitats. U.S. Department of the Interior, FWS/OBS-78/29, 260 pp.

Zimmerman, P.A., et al. 1989. Polymorphic Regions In Plant Genomes Detected by an M13 Probe. Genome 32: 824-828.

Chevron Richmond Power Plant Replacement Project
07-SPPE-1
DATA REQUEST RESPONSE SET 1B

Technical Area: Cultural Resources
Author: Beverly E. Bastian

BACKGROUND

In the Cultural Resources section, the application states that the local ordinances, plans, and policies of the city of Richmond do not apply to this project (p. 8.3-4), and then says that this jurisdictional issue is discussed in the section 8.4, Land Use. Staff did not find such a discussion in the Land Use section. To complete its analysis of the proposed project's compliance with laws, ordinances, regulations, and standards, staff needs to understand why the applicant believes that the local ordinances, plans, and policies of the city of Richmond do not apply to this project.

DATA REQUEST

28. Please explain why the local ordinances, plans, and policies of the city of Richmond, with respect to cultural resources, do not apply to this project.

Response: The previous response submitted in Data Request Response Set 1A explained that the local ordinances, plans and policies of the city of Richmond do apply to this project and indicated that, based on the draft EIR, compliance is expected. The following is an expanded discussion of the applicable City of Richmond cultural resources LORS and a demonstration of the PPRP's compliance with these LORS.

The City of Richmond General Plan contains the following policies and implementation programs relevant to cultural and historic resources:

Policy LU-A.4: Requires new development adjacent to historical sites to incorporate design elements so as to complement the character of the surrounding historical structures. (Note: Same as Policy OSC-E.4.)

PPRP Compliance: PPRP is located entirely within the Chevron Richmond Refinery and is not adjacent to any historic sites. Therefore, incorporation of complementary design elements is not required.

Policy LU-A.5: Preserve and enhance existing cultural and artistic artifacts and resources in the City.

PPRP Compliance: PPRP is located entirely within the Chevron Richmond Refinery. As a result of archival research and field survey, no cultural or artistic artifacts or resources were identified. Never-the-less, Chevron will implement mitigation measures to protect artifacts and resources that could be discovered during construction. These mitigation measures are identified in Section 8.3.6 of the PPRP Small Power Plant Exemption (SPPE) Application.

Policy OSC-E.1: Require archaeology reconnaissance surveys for all projects within an archaeological sensitivity area (as identified on maps on file with the Planning

Department). When cultural resources are located, measures to deal with the historic resource shall be recommended by a qualified archaeologist.

PPRP Compliance: Chevron commissioned both archival research and field survey of the proposed project site and adjacent areas for the preparation of the SPPE application. No sensitive resources have been identified in the project area.

Policy OSC-E.2: Protect notable historic, archaeological, and cultural sites from destruction.

PPRP Compliance: Based on the results of the archival research and field survey performed for the SPPE application, no historic, cultural or cultural site or resources were identified in the areas to be impacted by PPRP construction or operation.

Policy OSC-E.3: Support formulation of a plan for interpretive facilities on specific sites. Sites near local and regional recreation areas should be preferred. Sites should be included in parks, trails, and other facilities whenever possible.

PPRP Compliance: No cultural, historic, or artistic sites were identified in the project area.

Implementation Program OSC-E.1: City will continue to utilize environmental reviews under the California Environmental Quality Act to review developments for potential impacts on archaeological and historical sites. If sites of archaeological significance are present, the procedures established in Appendix K [now section 15064.5] of the CEQA Guidelines will be applied.

PPRP Compliance: The PPRP and Chevron Richmond Refinery Renewal project are undergoing CEQA review by the CEC and City of Richmond, respectively.

BACKGROUND

For Native American consultation regarding the proposed project, the applicant is relying on the previous outreach to Native Americans made for the Chevron Renewal Project in October, 2005 (p. 8.3-14). In addition to providing contact information for concerned Native Americans, the Native American Heritage Commission (NAHC) cautions that a given list is only current for the date on which the list is sent to the person requesting it, so the applicant is citing the results of an outreach effort addressed to a list of Native Americans that is nearly two years old. Staff requires that an up-to-date list of Native Americans be obtained from the NAHC and new information specific to this proposed PPRP be sent to any Native American individuals or groups not included on the Chevron Renewal Project's October, 2005, list, with a request for information on any known cultural resources.

DATA REQUESTS

29. Please obtain an up-to-date list of potentially concerned Native Americans from the NAHC and send out letters informing those not on the previous list about the

proposed PPRP project. Please include with the letters a map of the project area showing the two project sites, the Cogen 3000 site and the hydrogen plant site.

Response: As indicated in the previous response submitted in Data Request Response Set 1A, a letter was prepared and submitted to NAHC (a copy was previously provided). A letter was received on September 7, 2007 from the NAHC that identified potentially concerned Native Americans (see Attachment CUL-29A). Attachment CUL-29B presents letters mailed to the list potentially interested Native Americans and copies of any responses received will be filed separately.

ATTACHMENT CUL-29A

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

September 7, 2007

Mr. Clint J. Helton, M.A., RPA, Project Scientist
CH2MHILL
3 Hutton Centre Drive
Santa Ana, CA 92707

Sent by FAX to: 714-429-2050
Number of pages: 2 3

Re: Cultural Resource Identification Study/Sacred Lands File Search for Proposed Chevron Refinery Power Plant Replacement Project; Point Richmond; Contra Costa County, California

Dear Mr. Helton:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any 'area of potential effect (APE).'

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the nearest tribes that may have knowledge of cultural resources in the project area. A List of Native American contacts are attached to assist you. The Commission makes no recommendation of a single individual or group over another. It is advisable to contact the person listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area (APE).

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

PS: Clint Debbie Pilas-Treadway is the NAHC Rep for Contra Costa. Her name should be used instead of mine when contacts are made. Thanks.

Native American Contacts
Contra Costa County
September 7, 2007

The Ohlone Indian Tribe
Andrew Galvan
PO Box 3152
Mission San Jose , CA 94539
chochenyo@AOL.com
(510) 656-0787 - Voice
(510) 882-0527 - Cell
(510) 687-9393 - Fax

Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Trina Marine Ruano Family
Ramona Garibay, Representative
16010 Halmar Lane
Lathrop , CA 95330
510-300-5971 - cell

Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister , CA 95024
ams@garlic.com
831-637-4238

Ohlone/Costanoan

Amah/MutsunTribal Band
Irene Zwierlein, Chairperson
789 Canada Road
Woodside , CA 94062
amah_mutsun@yahoo.com
(650) 851-7747 - Home
(650) 851-7489 - Fax

Ohlone/Costanoan

Jakki Kehl
720 North 2nd Street
Patterson , CA 95363
jakki@bigvalley.net
(209) 892-2436
(209) 892-2435 - Fax

Ohlone/Costanoan

Amah/Mutsun Tribal Band
Michelle Zimmer, Cultural Resource Coordinator
P O Box 3892
Clear Lake , CA 95422
408-375-4281

Ohlone/Costanoan

Katherine Erolinda Perez
PO Box 717
Linden , CA 95236
(209) 474-2602

Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok

Don Hankins
P.O. Box 627
Forest Ranch , CA 959421
530-343-3489 - phone/fax

Miwok

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed BChevron Refinery Power Plant Replacement Project; Point Richmond; Contra Costa County, California.

Native American Contacts
Contra Costa County
September 7, 2007

Amah/Mutsun Tribal Band
Joseph Mondragon, Tribal Administrator
882 Bay view Avenue Ohlone/Costanoan
Pacific Grove , CA 94062
831-372-9015
831-372-7078 - fax

Amah/Mutsun Tribal Band
Melvin Ketchum III, Environmental Coordinator
7273 Rosanna Street Ohlone/Costanoan
Gilroy , CA 95020
408-842-3220

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed SChevron Refinery Power Plant Replacement Project; Point Richmond; Contra Costa County, California.

ATTACHMENT CUL-29B

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Mr. Melvin Ketchum III
Amah/Mutsun Tribal Band
7273 Rosanna Street
Gilroy, CA 95020

Re: Chevron Refinery Power Plant Replacement Project

Dear Mr. Ketchum:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

A search of the Sacred Land files by the Native American Heritage Commission (NACH) in September 2007 failed to indicate the presence of Native American sacred sites in the immediate Project vicinity.

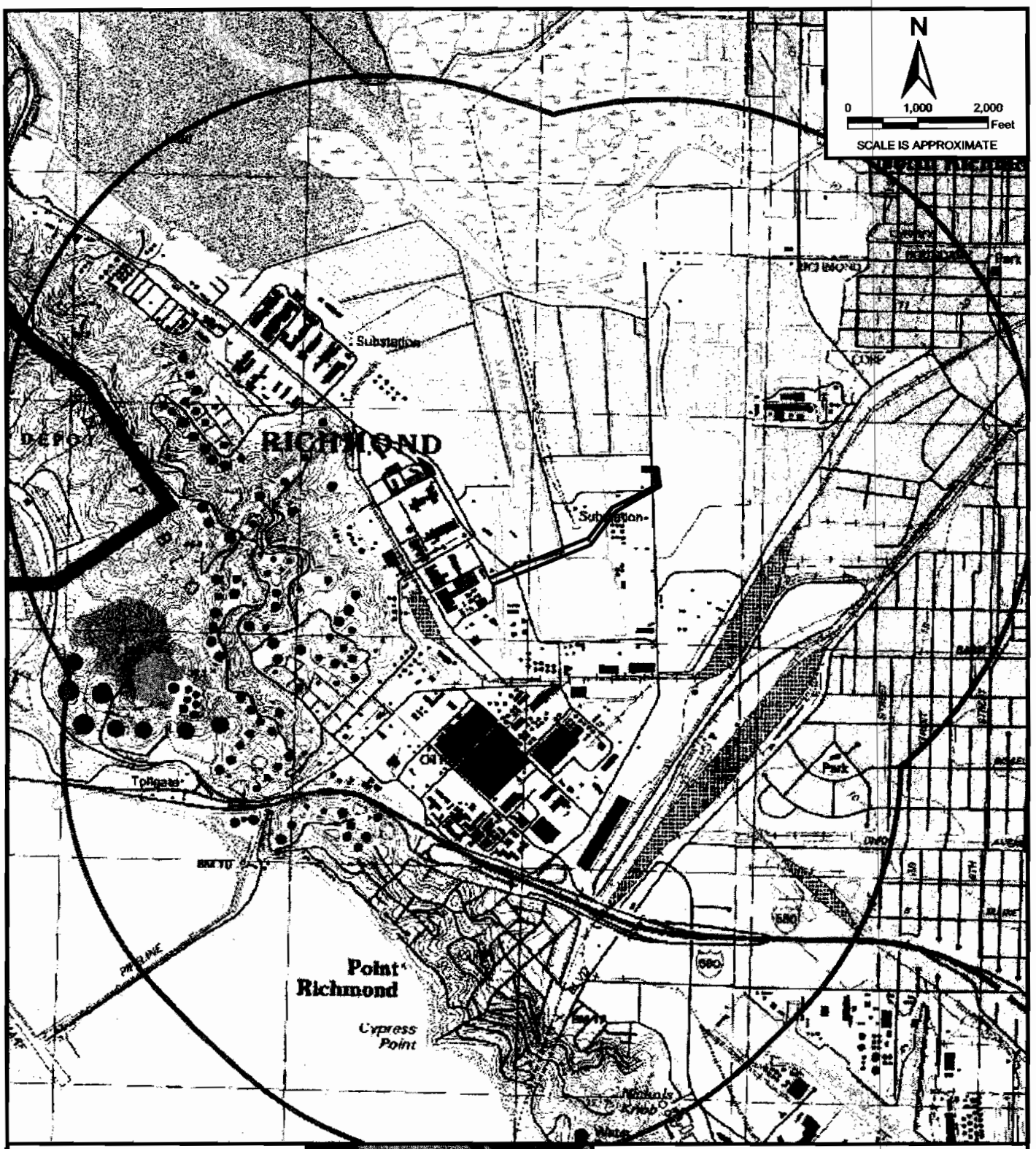
If you know of any traditional cultural properties or values (e.g., burial sites, religious sites, or gathering sites) within the Project area shown on the enclosed map, or if you have any concerns regarding issues related to the overall Project, please contact me at (714) 435-6140 or by mail; you may also contact me at chelton@ch2m.com.

Your project comments and concerns are important to us. I look forward to hearing from you in the near future.

Respectfully yours,

Clint Helton, RPA
Project Scientist

cc: File
Enclosure – Map of Project Area



LEGEND

- Plant Area
- Laydown Area
- Transmission Line
- 1 Mile Buffer

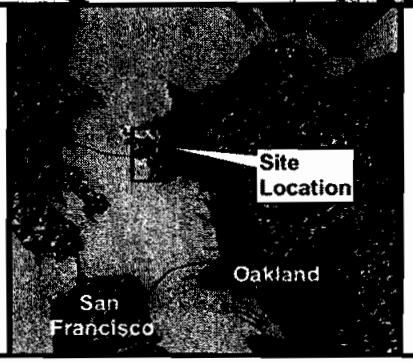


FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

ES042007007SAC figure 8_3_1.ai 06/13/07 ldaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Mr. Joseph Mondragon
Amah/Mutsun Tribal Band
882 Bay View Avenue
Pacific Grove, CA 94062

Re: Chevron Refinery Power Plant Replacement Project

Dear Mr. Mondragon:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Respectfully yours,

Clint Helton, RPA
Project Scientist

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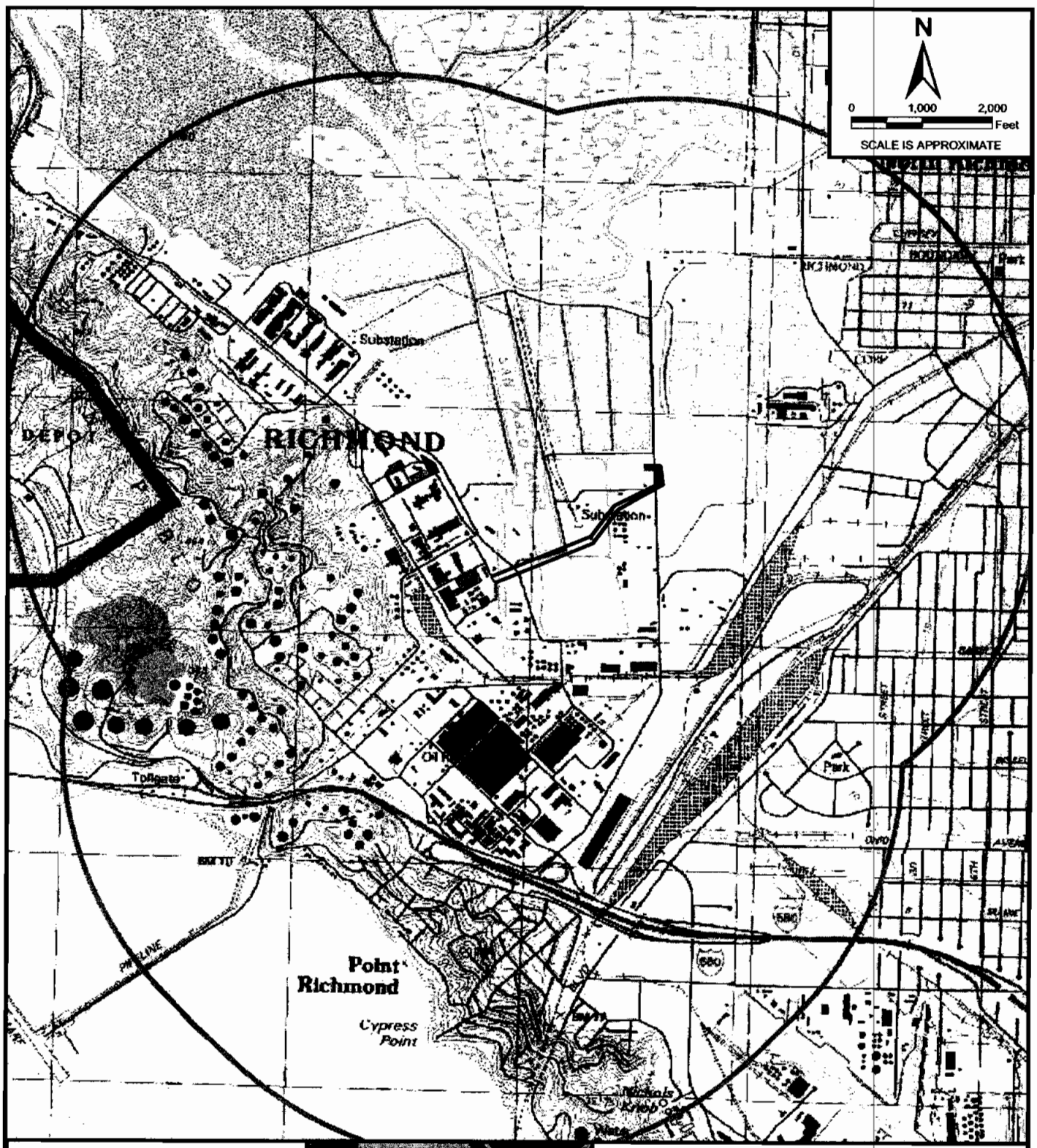

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

ES042007007SAC figure 8_3_1.ai 06/13/07 trlaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Ms. Michelle Zimmer
Amah/Mutsun Tribal Band
P.O. Box 3892
Clear Lake, CA 95422

Re: Chevron Refinery Power Plant Replacement Project

Dear Ms. Zimmer:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Respectfully yours,

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Project Scientist

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Enclosure—Map of Project Area

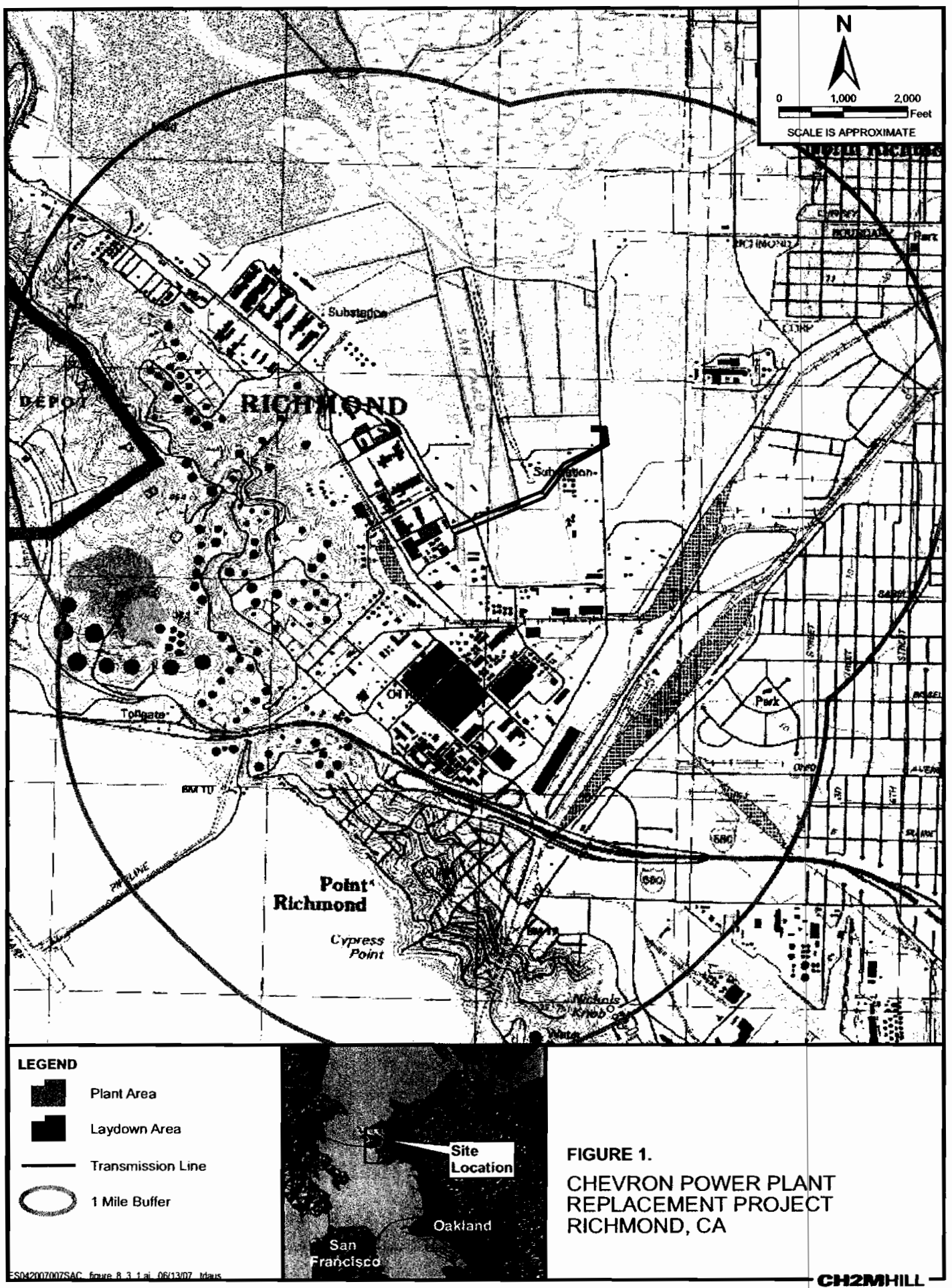

FIGURE 1.

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ES042007007SAC figure 8.3.1.ai 06/13/07 ldaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Ms. Irene Zwierlein
Amah/Mutsun Tribal Band
789 Canada Road
Woodside, CA 94062

Re: Chevron Refinery Power Plant Replacement Project

Dear Ms. Zwierlein:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Respectfully yours,

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Project Scientist

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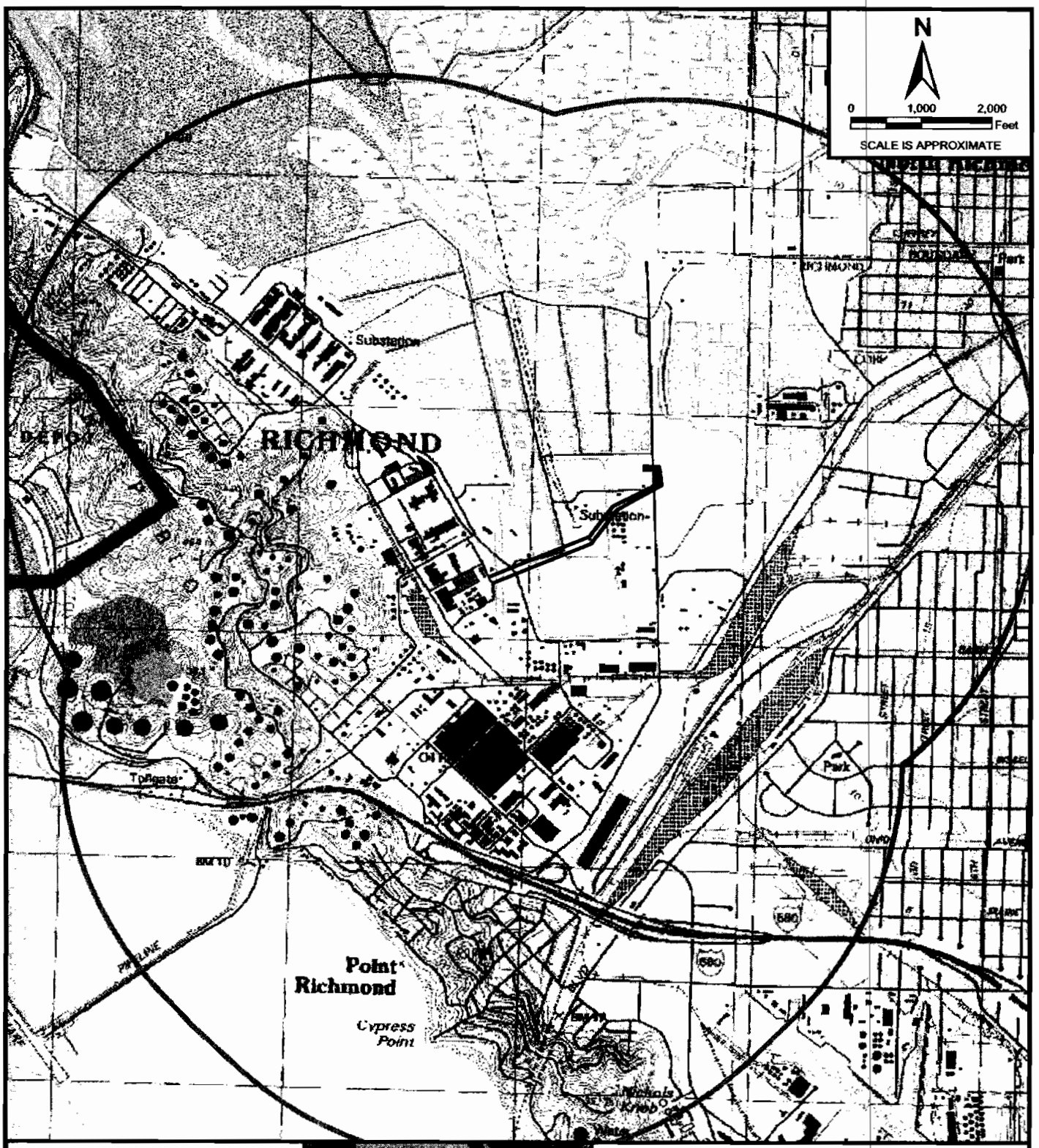

LEGEND

- Plant Area
- Laydown Area
- Transmission Line
- 1 Mile Buffer

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

ES042007007SAC figure 8.3.1.ai 06/13/07 kdaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Mr. Don Hankins
P.O. Box 627
Forest Ranch, CA 959421

Re: Chevron Refinery Power Plant Replacement Project

Dear Mr. Hankins:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Project Scientist

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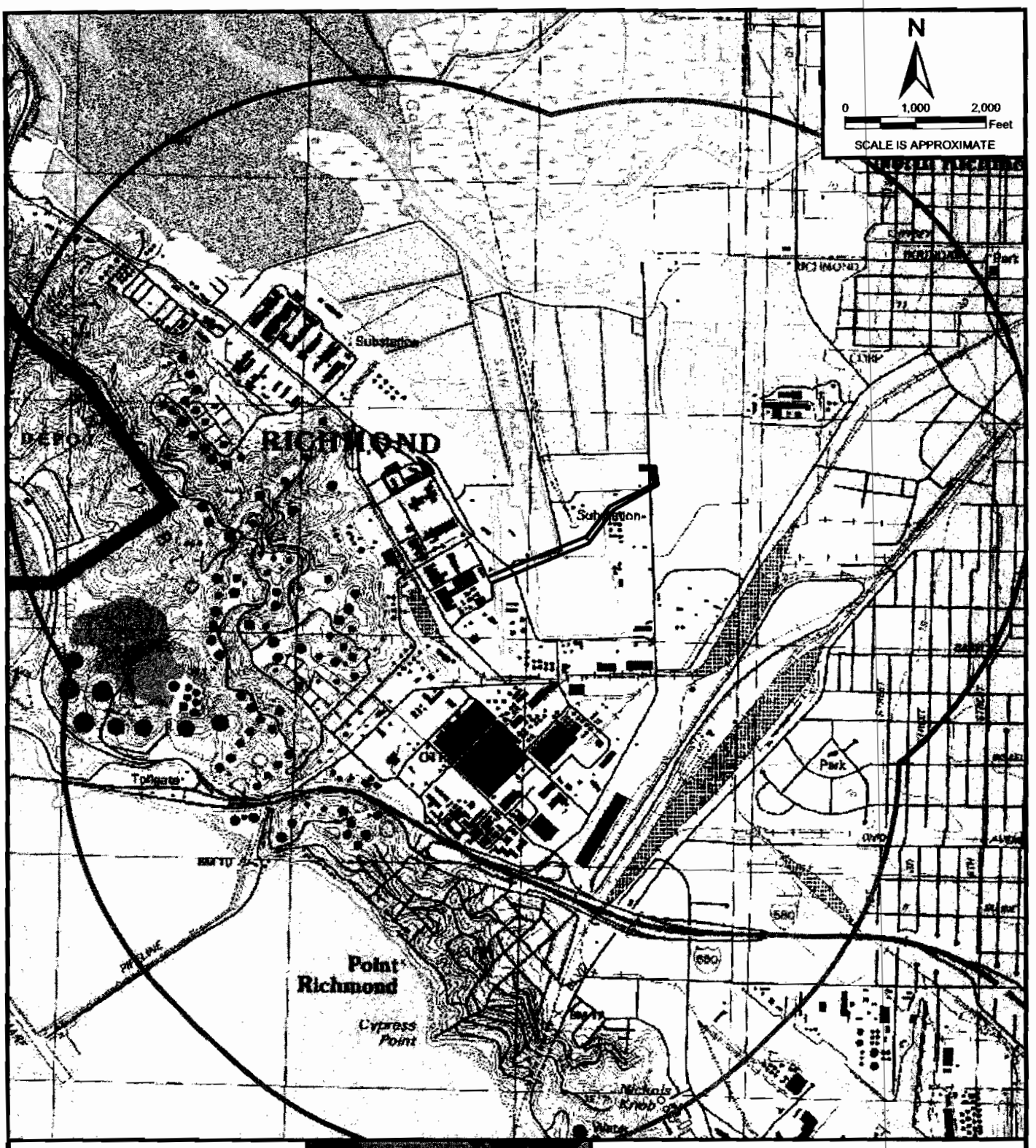

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT
RICHMOND, CA

ES042007007SAC figure 8_3_1.ai 06/13/07 tdaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Ms. Jakki Kehl
720 North 2nd Street
Patterson, CA 95363

Re: Chevron Refinery Power Plant Replacement Project

Dear Ms. Kehl:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Project Scientist

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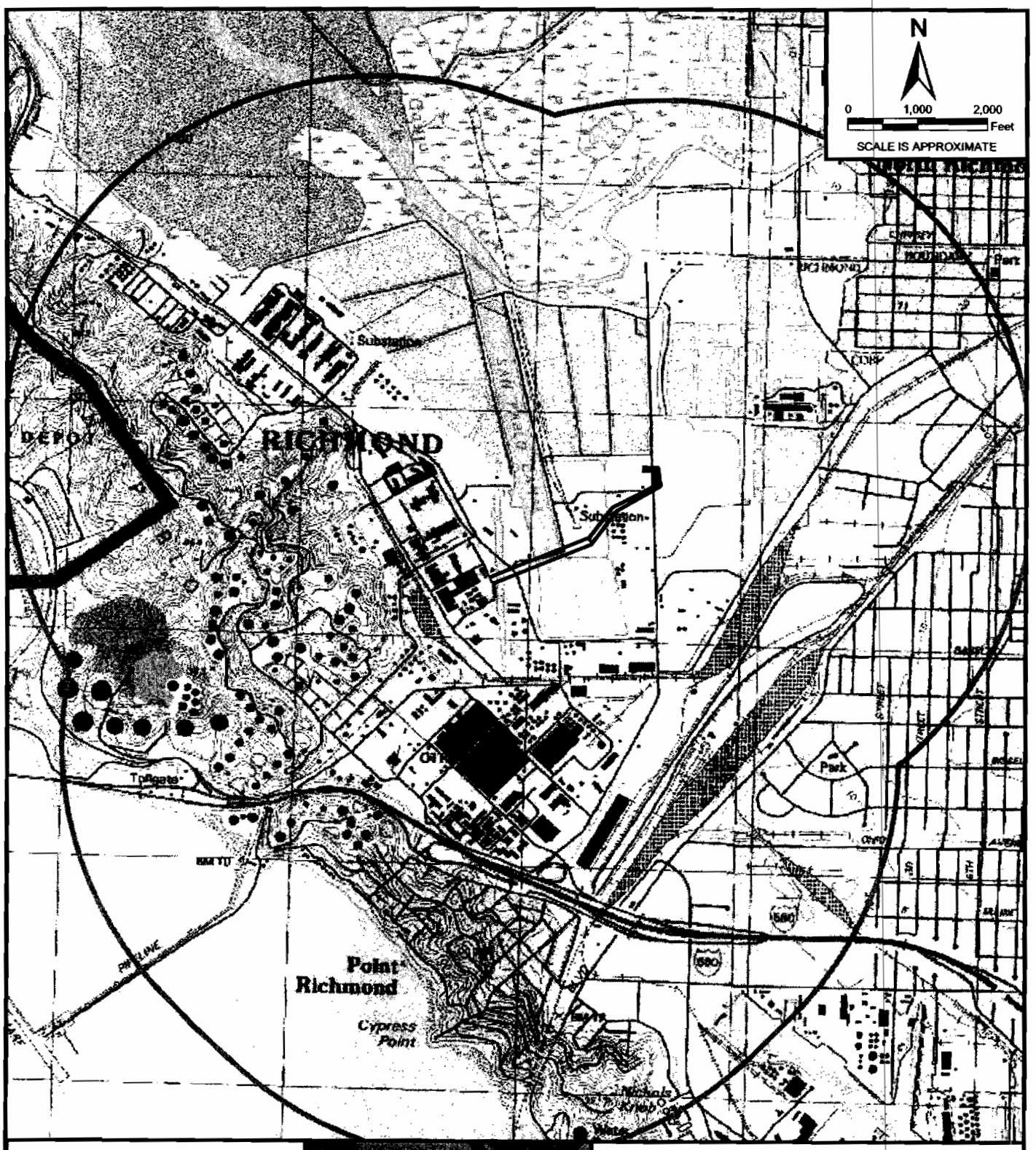

LEGEND

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FIGURE 1.

CHEVRON POWER PLANT
REPLACEMENT PROJECT
RICHMOND, CA

ES042007007SAC figure 8_3_1.ai 06/13/07 ldaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Ms. Ann Marie Sayers
Chairperson
Indian Canyon Mutsun Band of Costanoan
P.O. Box 28
Hollister, CA 95024

Re: Chevron Refinery Power Plant Replacement Project

Dear Ms. Sayers:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Project Scientist

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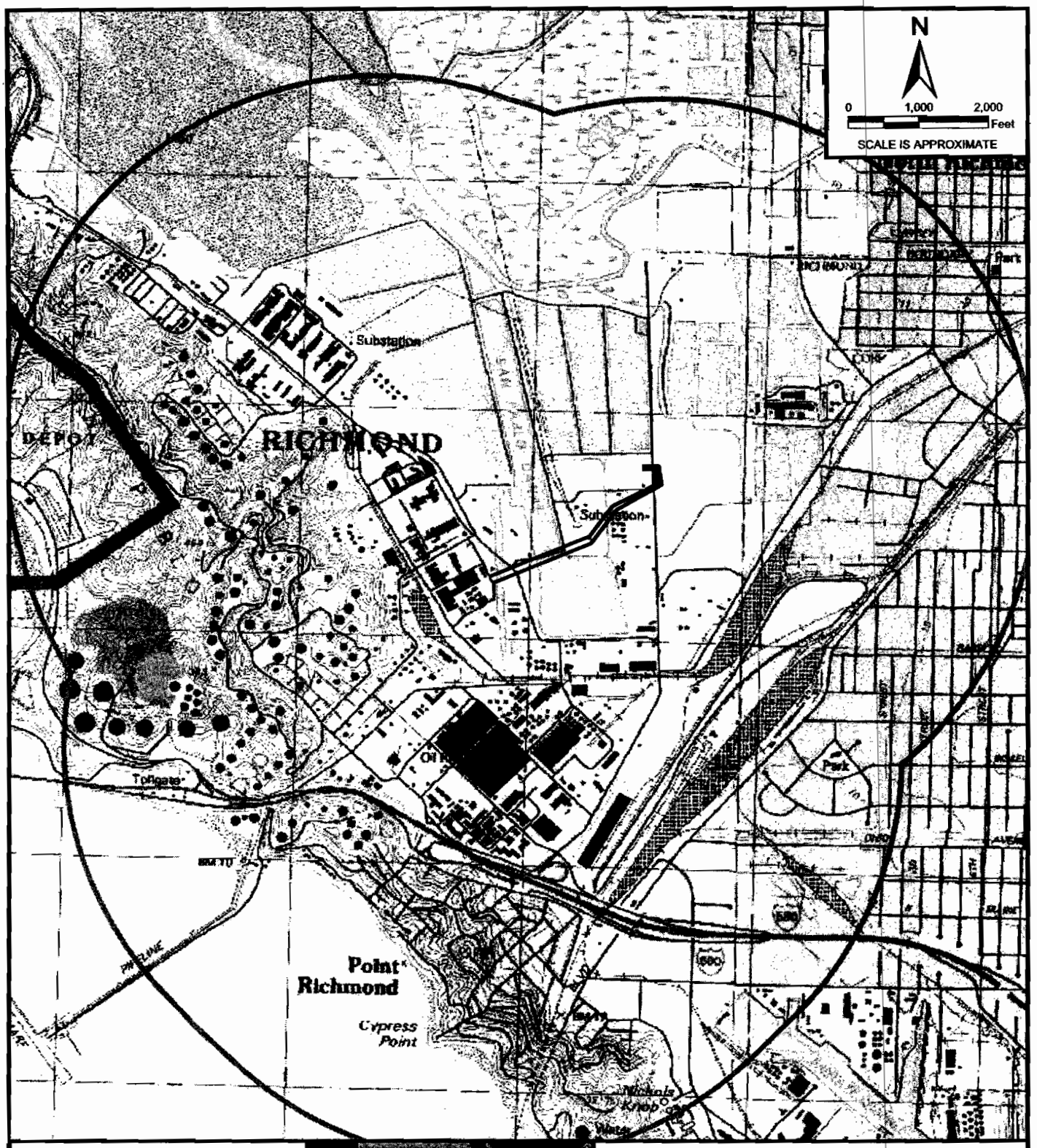

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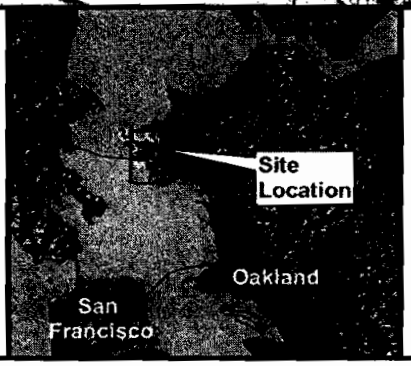

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

ES042007007SAC figure 8-3-1.ai 06/13/07 tdaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Mr. Andrew Galvan
The Ohlone Indian Tribe
P.O. Box 3152
Mission San Jose, CA 94539

Re: Chevron Refinery Power Plant Replacement Project

Dear Mr. Galvan:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Clint Helton, RPA
Project Scientist

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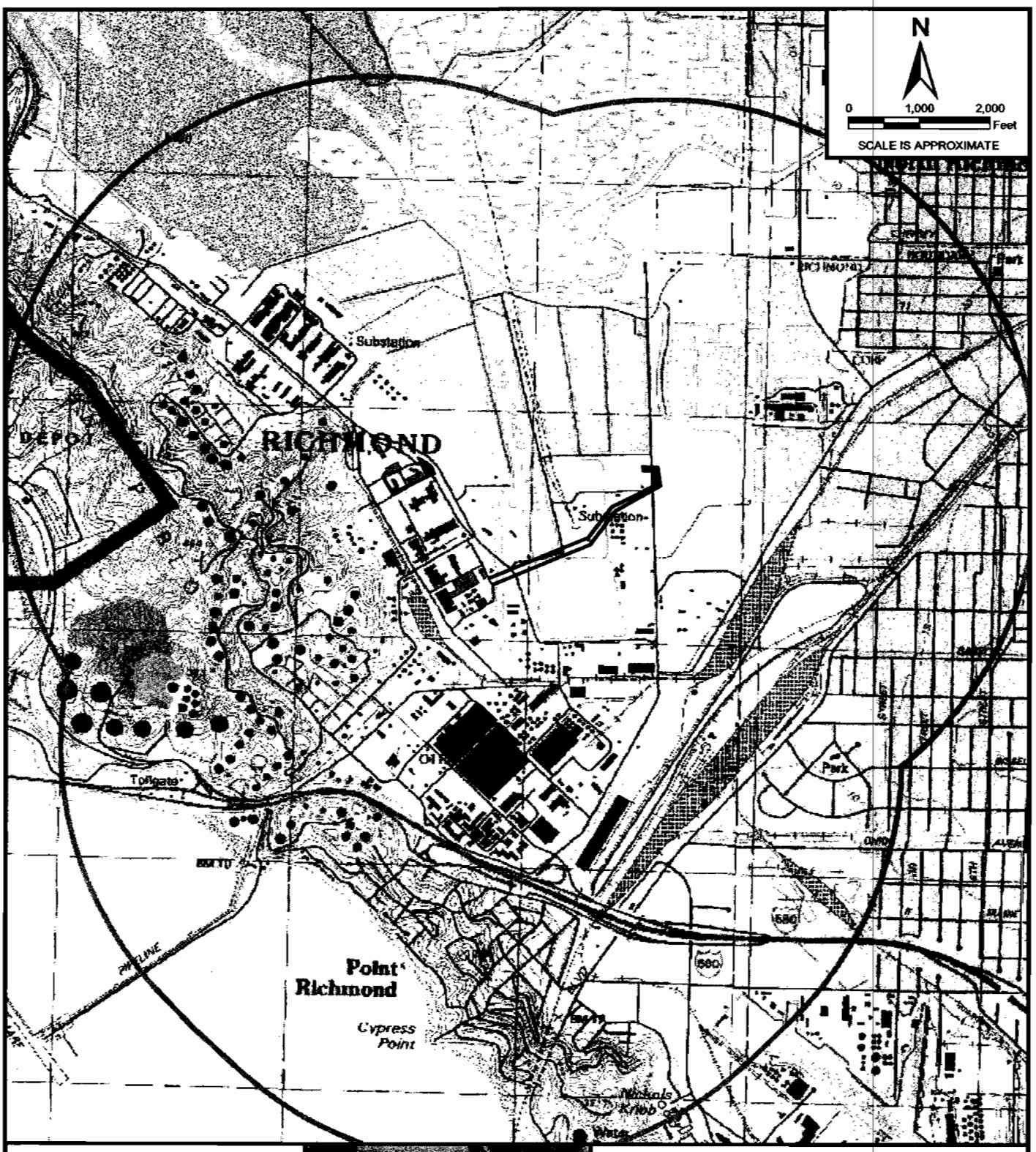

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- Transmission Line
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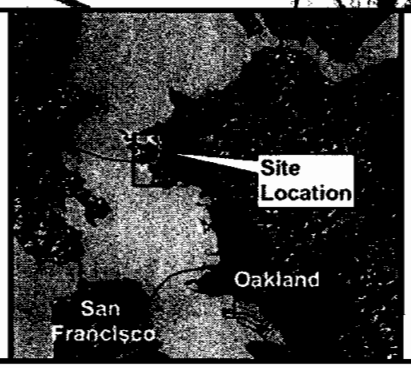

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

ES042007007SAC figure 8-3-1.ai 06/13/07 ldaus

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Ms. Katherine Erolinda Perez
P.O. Box 717
Linden, CA 95236

Re: Chevron Refinery Power Plant Replacement Project

Dear Ms. Perez:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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Clint Helton, RPA
Project Scientist

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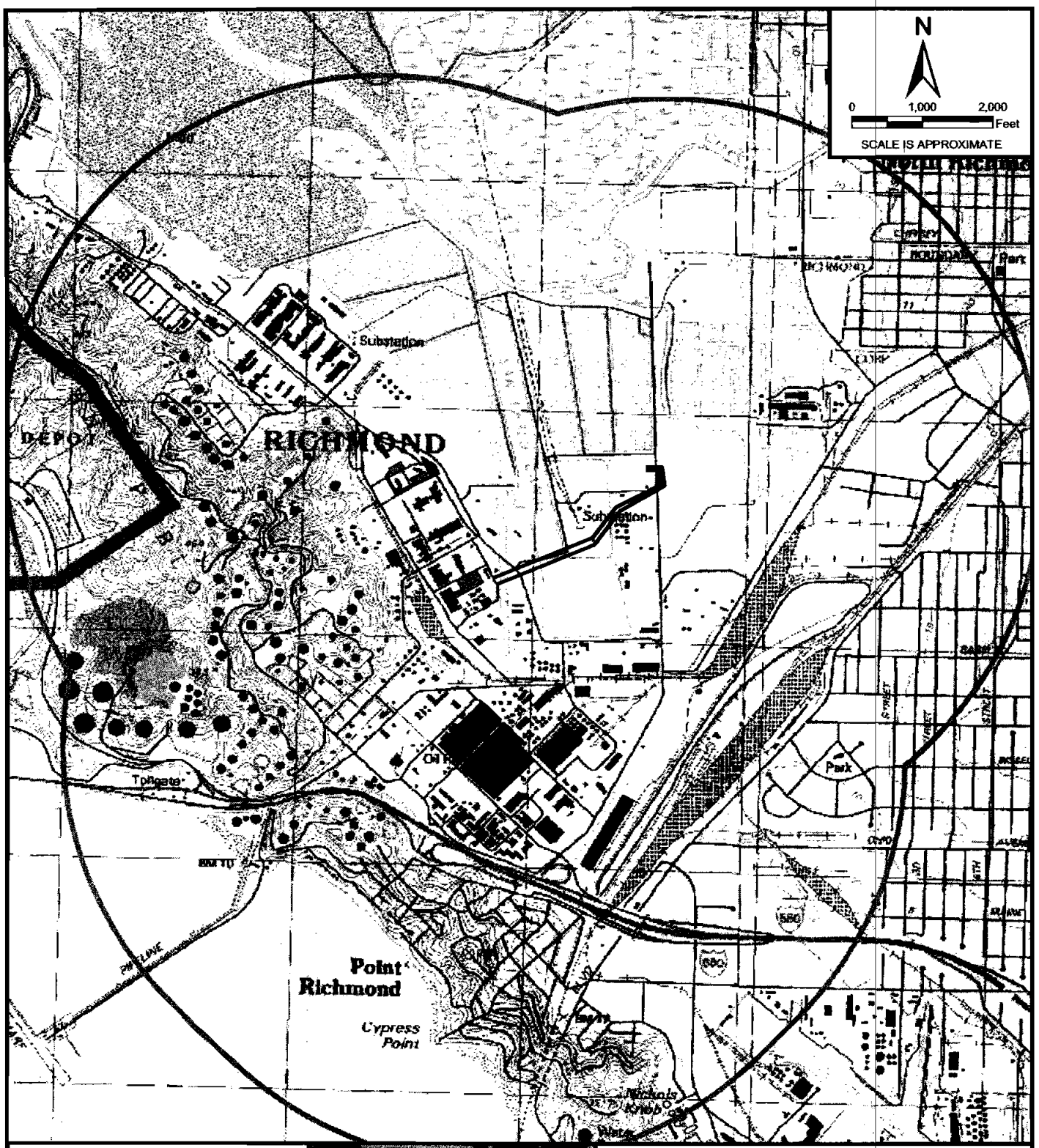

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

CH2MHILL

CH2M HILL
3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707
Tel 714.429.2000
Fax 714.429.2050

CH2MHILL

September 12, 2007

Ms. Ramona Garibay
Trina Marine Ruano Family
16010 Halmar Lane
Lathrop, CA 95330

Re: Chevron Refinery Power Plant Replacement Project

Dear Ms. Garibay:

CH2M HILL is assisting Chevron with the preparation of a Small Power Plant Exemption (SPPE) before the California Energy Commission (CEC) for the Chevron Refinery Power Plant Replacement Project (PPRP) located in Richmond, California. The project area is indicated on the enclosed map (Pt. Richmond and San Quentin 7.5 Minute USGS quadrangles).

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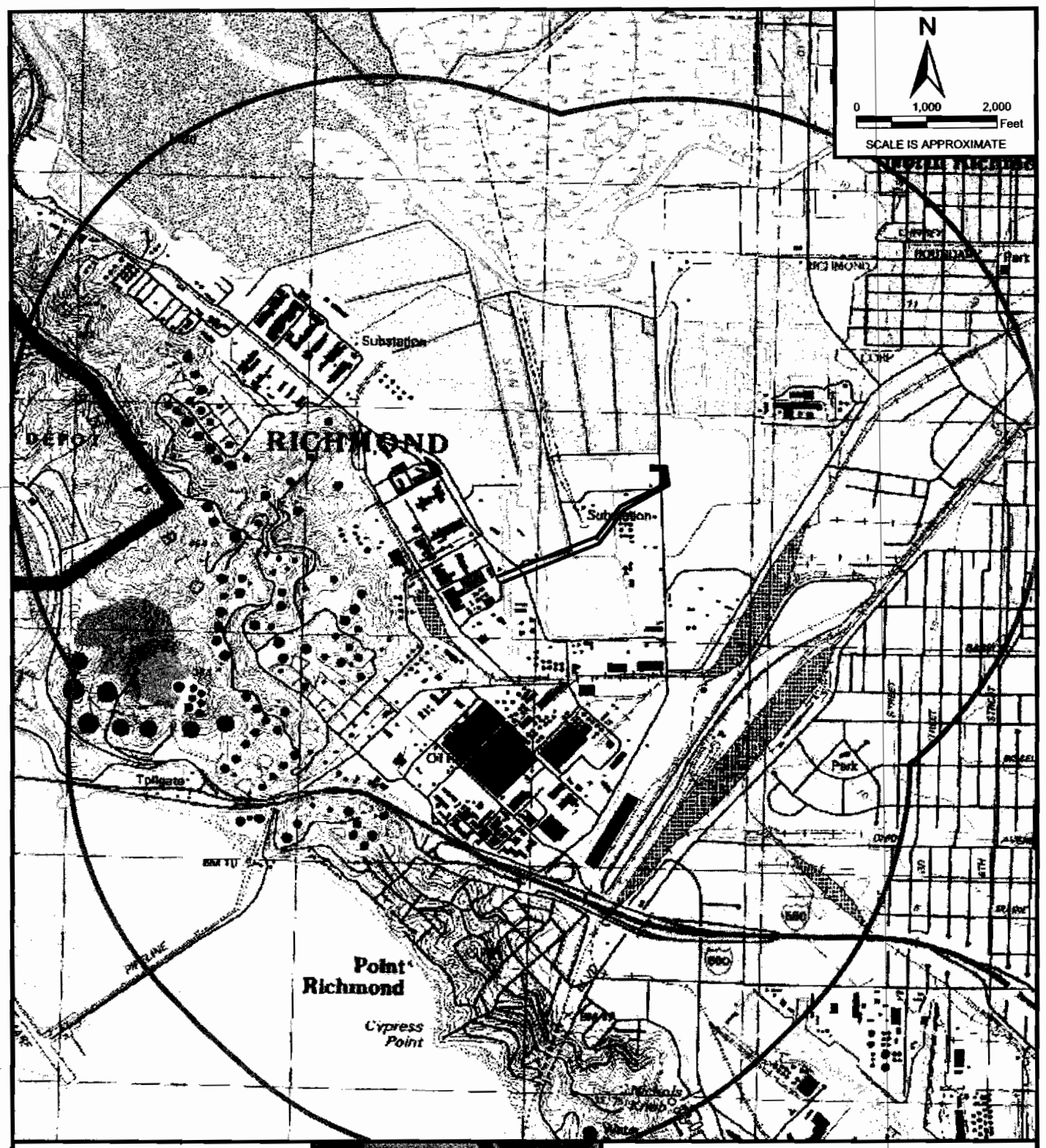

FIGURE 1.

CHEVRON POWER PLANT REPLACEMENT PROJECT RICHMOND, CA

ES042007007SAC figure 8_3_1.ai 06/13/07 ldaus

CH2MHILL

Chevron Richmond Power Plant Replacement Project
07-SPPE-1
DATA REQUEST RESPONSE SET 1B

Technical Area: Public Health
Author: Dr. Alvin Greenberg

BACKGROUND

The SPPE Application states that the emission factors for TACs from the gas turbine used in the HRA were obtained from the Energy & Environmental Research Corporation (EERC) August 1998 publication entitled "Air Toxic Emission Factors for Combustion Sources Using Petroleum Based Fuels, Final Report, Volume II". Staff needs this information to assess the accuracy of emission factors from the three fuels proposed for use in the combustion turbine.

DATA REQUEST

51. Please provide the August 1998 report referenced above.

Response: Based on a review of the TAC emissions factors, it was noted that an error was made in transcribing the emission factors. Revised TAC emissions for the Hydrogen Plant cooling tower and Cogen 3 (in addition to all of the Renewal project emission sources) are presented in Attachment AQ-12B. Furthermore, the BAAQMD performed a health risk assessment based on these TAC emission estimates. The results of this assessment are presented in Table PH-51A. Based on the revised emission factors, a revised health risk assessment was prepared for the PPRP project. The results of this assessment are shown in Table PH-51B. The HRA results show that the PPRP are not expected to result in a human health risk. Copies of the PPRP modeling input and output files are being submitted under a separate cover. Additional copies will be provided on request.

TABLE PH-51A BAAQMD's Human Health Risk Assessment Results for the Chevron Refinery Renewal Project

Type of Estimated Health Impact[1]	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index
Maximum Exposed Individual Worker	0.8	0.13	0.6
Maximum Exposed Individual Residence	0.4	0.08	0.2
Point of Maximum Impact[2]	3.9	0.22	0.6

[1] Does not include impacts from new storage tanks.

[2] The point of maximum impact occurs at locations where there are no residences or workers. The cancer risk and the chronic hazard index at the point of maximum impact are conservatively calculated as for a residence.

TABLE PH-51B PPRP Human Health Risk Assessment Results

Type of Estimated Health Impact[1]	Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index
Maximum Exposed Individual Worker	0.33	0.16	0.14
Maximum Exposed Individual Residence	0.24	0.02	0.02
Point of Maximum Impact[2]	1.7	0.16	0.14

[1] Does not include impacts from new storage tanks.

[2] The point of maximum impact occurs at locations where there are no residences or workers. The cancer risk and the chronic hazard index at the point of maximum impact are conservatively calculated as for a residence.

Technical Area: Socioeconomics
Author: Hedy Born

BACKGROUND

The applicant has stated on page 8.7-4 (Section 8.7.2.1.2) of the SPPE that the "estimated value of materials and supplies that will be purchased locally during construction is expected to be about $60 million." To gather a complete set of data and information on fiscal resources of the proposed project, please provide the following.

DATA REQUEST

52. a. Please provide the increase in estimated annual property taxes as a result of the project;

Response: Property tax values are calculated based on the lesser of Proposition 8 (market values) or Proposition 13 values (1975 base year values trended forward with property value added for new construction). The county is required to use three methods to assess property market value - cost, income, and sales comparison approach. The calculations for all methods have many unsettling parameters (e.g., margins, discount rates, equitable comparisons, etc) and it is extremely problematic to predict the impact on value. Nevertheless, assuming everything else equal, lower refinery operating costs, including PPRP, would tend to increase the assessed property value of the refinery and property taxes.

c. Please provide the estimated school impact fees, if applicable.

Response: School impact fees are calculated based on the lesser of Proposition 8 (market values) or Proposition 13 values (1975 base year values trended forward with an incremental value each year for new construction). The county is required to use three methods to assess property market value - cost, income, and sales comparison approach. The calculations for all methods have many unsettling parameters (e.g., margins, discount rates, equitable comparisons, etc) and it is extremely problematic to predict the impact on value. Nevertheless, assuming everything else equal, lower refinery operating costs, including PPRP, would tend to increase the assessed property value of the refinery and school impact fees.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA

CHEVRON RICHMOND POWER PLANT REPLACEMENT PROJECT SMALL POWER PLANT EXEMPTION

DOCKET NO. 07-SPPE-1
PROOF OF SERVICE LIST
(REVISED 8/24/2007)

INSTRUCTIONS: All parties shall (1) file a printed, original signed document plus 12 copies OR file one original signed document and e-mail the document to the Docket address below, AND (2) all parties shall also send a printed OR electronic copy of the document, plus a proof of service declaration, to each of the entities and individuals on the proof of service list:

CALIFORNIA ENERGY COMMISSION
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DECLARATION OF SERVICE

I, Jeannette Harris, declare that on September 25, 2007, I deposited the required copies of the attached Data Responses, Set 1B, filed on behalf of Chevron (07-SPPE-1) in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above. I declare under penalty of perjury that the foregoing is true and correct.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Jeannette Harris

Jeannette Harris