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Watson Cogeneration Company

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Carson, CA 90740-6203

Darrin Fost
Business Manager
310.816.8812

March 31, 2022

Mr. Anwar Ali
Compliance Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

**Subject: 2021 Annual Compliance Report
Watson Cogeneration Project (85-AFC-01C)**

Dear Mr. Ali,

Attached is the Annual Compliance Report for 2021 pursuant to the requirements of the California Energy Commission's Conditions of Certification for the Watson Cogeneration Company.

If you have any questions regarding this report, please contact me via telephone at (310) 816-8812 or via e-mail at DFost@Marathonpetroleum.com.

Sincerely,

Darrin Fost

Darrin Fost
Business Manager
Watson Cogeneration Company

AIR QUALITY CONDITIONS OF CERTIFICATION

AQ-25 A continuous monitoring system must be installed and operated to monitor and record the fuel consumption and the mass ratio of steam-to-fuel for each fuel being fired in each gas Turbines 1, 2, 3, 4 and 5. This system must be accurate to within +5.0 percent and calibrated once every 12 months.

Verification: The owner/operator shall maintain records of continuous fuel consumption and the steam-to-fuel mass ratio monitoring. These records will be maintained on file for at least two years and shall be made available to the SCAQMD and CEC staff upon request. CEM Relative Accuracy Test report will be submitted to the CEC annually.

Response: Instrumentation is in place for the purpose of continuous monitoring and recording of fuel consumption and steam injection to each of the four gas turbines at the facility (#5 was never constructed). The systems undergo regular calibration. A summary of fuel consumption and steam injection to each of the turbines is included below.

AQ-25	Unit 91					Unit 92				
	NG/RFG	Butane	Total Fuel	DeNOx Steam	Steam : Fuel	NG/RFG	Butane	Total Fuel	DeNOx Steam	Steam : Fuel
	lb/sec	lb/sec	lb/sec	lb/sec	Ratio	lb/sec	lb/sec	lb/sec	lb/sec	Ratio
Jan-21	11.384	0.204	11.587	14.163	1.222	11.479	0.583	12.063	14.228	1.180
Feb-21	9.077	2.560	11.636	14.508	1.247	8.710	2.647	11.357	13.652	1.357
Mar-21	11.303	0.266	11.569	14.272	1.234	11.573	0.615	12.188	14.433	1.184
Apr-21	11.453	0.005	11.458	14.191	1.238	10.136	0.523	10.659	12.748	1.487
May-21	11.270	0.084	11.354	14.043	1.237	10.937	1.118	12.055	14.350	1.190
Jun-21	11.340	0.003	11.343	14.081	1.241	10.377	0.538	10.915	13.044	1.291
Jul-21	11.222	0.007	11.229	13.996	1.246	11.216	0.496	11.712	14.142	1.208
Aug-21	11.142	0.003	11.146	13.864	1.244	11.241	0.488	11.729	14.118	1.203
Sep-21	7.972	0.088	8.060	10.517	2.190	9.581	0.458	10.040	12.275	1.819
Oct-21	11.147	0.139	11.286	14.192	1.259	11.435	0.548	11.983	14.422	1.204
Nov-21	10.349	0.116	10.465	12.976	1.466	11.342	0.571	11.913	14.260	1.197
Dec-21	10.933	0.293	11.226	13.503	1.334	11.544	0.722	12.266	14.295	1.165
AQ-25	Unit 93					Unit 94				
	NG/RFG	Butane	Total Fuel	DeNOx Steam	Steam : Fuel	NG/RFG	Butane	Total Fuel	DeNOx Steam	Steam : Fuel
	lb/sec	lb/sec	lb/sec	lb/sec	Ratio	lb/sec	lb/sec	lb/sec	lb/sec	Ratio
Jan-21	10.309	0.456	10.765	12.568	1.191	11.287	0.196	11.483	14.085	1.227
Feb-21	10.477	0.379	10.856	13.478	1.249	10.921	0.153	11.074	14.000	1.271
Mar-21	11.285	0.526	11.811	13.774	1.166	3.343	0.111	3.454	5.296	4.844
Apr-21	11.148	0.519	11.667	13.594	1.165	11.566	0.246	11.812	14.424	1.221
May-21	10.983	0.512	11.495	13.351	1.161	11.497	0.138	11.635	14.338	1.232
Jun-21	10.992	0.574	11.566	13.440	1.162	11.462	0.101	11.564	14.346	1.241
Jul-21	10.819	0.614	11.433	13.220	1.156	11.407	0.119	11.526	14.348	1.245
Aug-21	10.689	0.701	11.391	12.996	1.141	11.304	0.114	11.419	14.164	1.240
Sep-21	10.944	0.665	11.609	14.535	1.251	11.485	0.202	11.687	14.634	1.252
Oct-21	10.974	0.636	11.610	14.298	1.231	11.182	0.123	11.305	14.079	1.245
Nov-21	10.699	0.621	11.320	13.710	1.211	10.030	0.147	10.177	12.786	2.822
Dec-21	0.915	0.090	1.005	1.282	3.460	11.579	0.442	12.021	14.407	1.198

AQ-42 No more than one of the cogeneration units 1, 2, 3, 4 or 5 shall startup or shutdown in any one day. For Turbine Trains 1, 2, 3 and 4, start up shall not exceed 8 hours and

shutdown shall not exceed 4 hours. For Turbine Train 5, neither start up nor shutdown shall exceed 4 hours in duration.

Verification: The owner/operator shall maintain an operation log for the facility which, at a minimum, will identify startup and shutdown occurrences for each cogeneration unit. The owner/operator shall submit in its Annual Compliance Report to the CEC a summary of the operational log demonstrating compliance with this condition 5. (97-0924-4; 88-0525-18b)

Response: In the 2021 calendar year, APPC/Watson had 15 startups and 16 shutdowns. No startups exceeded an 8 hour duration and no shutdowns exceeded a 4 hour duration. Startup and shutdown dates shown in the tables below.

AQ-42: Shutdown Summary - 2021		
Unit	Date	Duration < 4 Hours
93	1/15/2021	Yes
93	2/12/2021	Yes
92	2/26/2021	Yes
94	3/5/2021	Yes
94	3/22/2021	Yes
92	4/9/2021	Yes
92	6/21/2021	Yes
92	7/14/2021	Yes
92	9/18/2021	Yes
91	9/22/2021	Yes
94	10/5/2021	Yes
94	11/5/2021	Yes
92	11/20/2021	Yes
93	11/27/2021	Yes
91	11/28/2021	Yes
93	12/3/2021	Yes

AQ-42: Startup Summary – 2021		
Unit	Date	Duration < 8 Hours
93	1/17/2021	Yes
93	2/13/2021	Yes
92	2/28/2021	Yes
94	3/20/2021	Yes
94	3/29/2021	Yes
92	4/13/2021	Yes
92	6/24/2021	Yes
92	7/15/2021	Yes
92	9/23/2021	Yes
91	10/1/2021	Yes
94	10/6/2021	Yes
94	11/9/2021	Yes
92	11/20/2021	Yes
93	11/27/2021	Yes
91	12/2/2021	Yes

AQ-43 The duct burner of the cogeneration units 1, 2, 3, 4 and 5 shall not be fired during the startup mode of operation.

Verification: The owner/operator shall maintain an operation log for the facility which, at minimum will identify the hours of operation of the duct burners. The owner/operator shall submit in its Annual Compliance Report to the CEC a summary of the operational log demonstrating compliance with this condition.

Response: During the 2021 calendar year, APPC/Watson had 15 startups. Duct burners were not fired during the startup mode of operation for any of the 15 startup events. Startup dates shown in the table below.

AQ-43: Startup Summary - 2021		
Unit	Date	Duct Fuel After Startup
93	1/17/2021	Yes
93	2/13/2021	Yes
92	2/28/2021	Yes
94	3/20/2021	Yes
94	3/29/2021	Yes
92	4/13/2021	Yes
92	6/24/2021	Yes
92	7/15/2021	Yes
92	9/23/2021	Yes
91	10/1/2021	Yes
94	10/6/2021	Yes
94	11/9/2021	Yes
92	11/20/2021	Yes
93	11/27/2021	Yes
91	12/2/2021	Yes

BIOLOGICAL RESOURCES CONDITIONS OF CERTIFICATION

BIO-3 APPC shall monitor daily the zinc content, total volume and duration of all discharges from the ARCO Watson Refinery into the Dominguez Channel, which contain commingled cogeneration project cooling tower blowdown. The initial period of monitoring shall cover the first three years during which water is discharged into the Dominguez Channel. The need for subsequent monitoring will be determined by the CEC based on an evaluation of the zinc content of samples collected during the first three years of discharge. APPC shall take remedial action if monitored zinc levels exceed the EPA standard for salt water aquatic life.

Verification: APPC shall notify the CEC within 30 days of any discharge which exceeds EPA levels for zinc describing the cause of the exceedance and action taken to prevent similar occurrences. APPC shall submit written reports for the first three years during which APPC discharges to Dominguez Channel. The report shall contain the date, time, volume, duration and zinc content of the discharge. These reports can be appended to the annual compliance report for the years during which discharges to Dominguez Channel occurred. The reports shall be Submitted to the CEC and the Port of Los Angeles.

Response: APPC/Watson does not have its own NPDES permit. Low Volume Waste (LVW; boiler blowdown) from the Cogen are authorized to be discharged to the Dominguez Channel under the Marathon Los Angeles Refinery – Carson Operations NPDES permit (Order No. R4-

2015-0295, NPDES No. CA0000680). Zinc is listed in the permit with an effluent limitation; therefore, a discharge would be analyzed for zinc. A copy of the annual NPDES report has been included at the end of this annual compliance report.

COGENERATION CONDITIONS OF CERTIFICATION

COG-1 ARCO Petroleum Products Company (APPC) shall operate the facility as a cogeneration system in accordance with the definition of cogeneration contained in PRC Section 25134(a) and (b) and Title 18 CFR, Section 292.205(a)(1) and (a)(2)(i)(B).

Verification: APPC shall file with the CEC during each calendar year an annual report in which monthly average values of the following plant operating parameters will be given:

- a. Gas turbine, MW (gross) at the generator terminals for each unit
- b. Gas turbine operating hours for each unit
- c. For each CTG and each HRSG duct burner provide fuel input including:
 - type, natural gas, refinery gas or butane
 - rate, lb/hr
 - heating value (low), Btu/lb
 - firing hours
- d. Inlet air flow, lb/hr
- e. Combustion turbine exhaust gas temperature, Deg F
- f. NOx steam injection rate, lb/hr
- g. Stack exiting flue gas temperature, Deg F
- h. Steam turbine, MW (gross)
- i. Steam turbine operating hours
- j. Plant auxiliary load, MW (total)
- k. For the process steam:
 - process steam demand, lb/hr
 - demand hours
 - process steam temperature (Deg F), quality (%), pressure (PSIA) and enthalpy (Btu/lb) at plant boundary
- l. Feedwater rate (lb/hr), temperature (Deg F)
- m. Condensate return rate (lb/hr), temperature (Deg F)
- n. Process steam from auxiliary boilers, lb/hr; auxiliary boiler's operating hours

Or APPC may, with CEC concurrence, submit the following operating parameters:

- o. Monthly fuel use (includes quantity and Btu value) as evidenced by an invoice from the gas supplier
- p. Monthly electrical sales (includes kWh) as evidenced by an invoice to Southern California Edison Company
- q. Monthly steam sales (includes quantity and Btu value) as evidenced by an invoice (or equivalent) to APPC
- r. If the rate of items o, p, or q above differs by more than +5, +15, and +10 percent, respectively, from rated conditions, APPC shall provide, at the specific written request of the CEC Staff, an explanation of such anomaly
- s. Feedwater rate (lb/hr) and temperature (Deg F)
- t. Condensate return rate (lbs/hr) and temperature (Deg F)
- u. Process steam from auxiliary boilers, lb/hr; auxiliary boiler's operating hours.

Not less than thirty (30) days prior to the scheduled date for the CEC Decision on the AFC, APPC shall notify the CEC of APPC's preference for either conditions a-n, or o-u.

This report shall also provide information for each month on any partial or total power and/or process steam production curtailment, including duration of curtailment and reasons for curtailment. The report shall be certified by the plant manager.

Response: Monthly average values of the above listed plant operating parameters are included in the tables below. Please note that parameter n. (auxiliary boilers) is not applicable, as there are no auxiliary boilers at this location.

COG-1 (a-n)	Unit 91													
Subsection:	a	b	c								d	e	f	g
			GTG					HRSG			Inlet	GTG	DeNOx	Stack
			NG/RFG	Butane	Total	HHV	Firing	NG/RFG	HHV	Firing	Air Flow	Exhaust	Steam	Exhaust
	MW	Op Hours	lb/hr	lb/hr	lb/hr	BTU/lb	Hours	lb/hr	BTU/lb	Hours	lb/hr	deg F	lb/sec	deg F
Jan-21	85.3	744	40982	733	41715	19692	744	4962	19692	744	2293699	1010	14.2	332
Feb-21	85.3	672	32676	9214	41890	20139	672	4801	20139	672	2293699	1012	14.5	332
Mar-21	85.8	743	40692	958	41650	20050	743	9832	20050	743	2293699	1023	14.3	330
Apr-21	85.0	720	41231	17	41248	20024	720	4830	20024	720	2293699	1023	14.2	332
May-21	84.4	744	40573	302	40875	20236	744	3472	20236	744	2293699	1022	14.0	333
Jun-21	83.9	720	40824	12	40836	20251	720	5707	20251	720	2293699	1027	14.1	332
Jul-21	82.3	744	40400	26	40426	20282	744	4378	20282	744	2293699	1027	14.0	333
Aug-21	81.9	744	40112	12	40125	19905	744	3867	19905	744	2293699	1030	13.9	332
Sep-21	60.8	512	28700	317	29017	21034	512	3931	21034	512	2293699	754	10.5	262
Oct-21	82.7	732	40130	500	40629	20643	732	3805	20643	731	2293699	1000	14.2	333
Nov-21	79.6	648	37256	417	37673	19989	648	4760	19989	648	2293699	921	13.0	313
Dec-21	81.2	704	39359	1055	40414	19665	704	9470	19665	704	2293699	962	13.5	318
COG-1 (a-n)	Unit 92													
Subsection:	a	b	c								d	e	f	g
			GTG					HRSG			Inlet	GTG	DeNOx	Stack
			NG/RFG	Butane	Total	HHV	Firing	NG/RFG	HHV	Firing	Air Flow	Exhaust	Steam	Exhaust
	MW	Op Hours	lb/hr	lb/hr	lb/hr	BTU/lb	Hours	lb/hr	BTU/lb	Hours	lb/hr	deg F	lb/sec	deg F
Jan-21	87.6	744	41326	2100	43426	19692	744	4962	19692	744	2293699	1028	14.2	341
Feb-21	84.0	634	31357	9529	40886	20139	634	4801	20139	670	2293699	985	13.7	334
Mar-21	88.2	743	41662	2213	43875	20050	743	9832	20050	742	2293699	1033	14.4	338
Apr-21	76.5	634	36489	1883	38372	20024	634	4830	20024	633	2293699	919	12.7	314
May-21	86.9	744	39374	4023	43398	20236	744	3472	20236	744	2293699	1031	14.4	341
Jun-21	78.1	656	37356	1937	39293	20251	656	5707	20251	683	2293699	965	13.0	329
Jul-21	84.0	735	40377	1787	42164	20282	735	4378	20282	734	2293699	1026	14.1	340
Aug-21	84.5	744	40467	1756	42223	19905	744	3867	19905	743	2293699	1037	14.1	340
Sep-21	71.7	602	34492	1651	36143	21034	602	3931	21034	598	2293699	890	12.3	310
Oct-21	86.6	744	41166	1971	43137	20643	744	3805	20643	744	2293699	1032	14.4	342
Nov-21	85.9	713	40830	2057	42887	19989	713	4760	19989	720	2293699	1024	14.3	340
Dec-21	87.5	744	41557	2599	44156	19665	744	9470	19665	744	2293699	1028	14.3	338
COG-1 (a-n)	Unit 93													
Subsection:	a	b	c								d	e	f	g
			GTG					HRSG			Inlet	GTG	DeNOx	Stack
			NG/RFG	Butane	Total	HHV	Firing	NG/RFG	HHV	Firing	Air Flow	Exhaust	Steam	Exhaust
	MW	Op Hours	lb/hr	lb/hr	lb/hr	BTU/lb	Hours	lb/hr	BTU/lb	Hours	lb/hr	deg F	lb/sec	deg F
Jan-21	75.2	705	37113	1641	38755	19692	705	4411	19692	704	2293699	949	12.6	334
Feb-21	79.7	652	37717	1365	39081	20139	652	4352	20139	650	2293699	992	13.5	340
Mar-21	82.9	743	40627	1892	42520	20050	743	10208	20050	743	2293699	1023	13.8	340
Apr-21	81.3	720	40133	1869	42002	20024	720	4884	20024	720	2293699	1023	13.6	341
May-21	80.2	744	39538	1843	41381	20236	744	3433	20236	744	2293699	1023	13.4	341
Jun-21	79.9	720	39571	2066	41637	20251	720	5690	20251	720	2293699	1027	13.4	340
Jul-21	77.7	744	38950	2210	41160	20282	744	4313	20282	744	2293699	1029	13.2	341
Aug-21	76.8	744	38481	2525	41006	19905	744	3744	19905	744	2293699	1029	13.0	341
Sep-21	79.2	720	39400	2393	41793	21034	720	7390	21034	720	2293699	1029	14.5	341
Oct-21	79.5	744	39507	2290	41797	20643	744	4038	20643	744	2293699	1025	14.3	343
Nov-21	77.4	696	38516	2236	40752	19989	696	5545	19989	695	2293699	992	13.7	338
Dec-21	6.6	59	3294	323	3617	19665	59	970	19665	60	2293699	136	1.3	88
COG-1 (a-n)	Unit 94													
Subsection:	a	b	c								d	e	f	g
			GTG					HRSG			Inlet	GTG	DeNOx	Stack
			NG/RFG	Butane	Total	HHV	Firing	NG/RFG	HHV	Firing	Air Flow	Exhaust	Steam	Exhaust
	MW	Op Hours	lb/hr	lb/hr	lb/hr	BTU/lb	Hours	lb/hr	BTU/lb	Hours	lb/hr	deg F	lb/sec	deg F
Jan-21	84.5	744	40634	705	41339	19692	744	4922	19692	744	2293699	1024	14.1	350
Feb-21	84.4	672	39317	551	39868	20139	672	4821	20139	672	2293699	1023	14.0	350
Mar-21	26.0	219	12036	399	12436	20050	219	614	20050	211	2293699	367	5.3	181
Apr-21	85.7	720	41637	884	42522	20024	720	4902	20024	720	2293699	1035	14.4	340
May-21	85.4	744	41389	496	41885	20236	744	3407	20236	744	2293699	1034	14.3	341
Jun-21	84.8	720	41264	364	41629	20251	720	5715	20251	720	2293699	1038	14.3	339
Jul-21	83.7	744	41066	429	41495	20282	744	4366	20282	744	2293699	1038	14.3	340
Aug-21	83.1	744	40695	412	41107	19905	744	3769	19905	744	2293699	1038	14.2	340
Sep-21	84.8	720	41346	726	42072	21034	720	7283	21034	720	2293699	1038	14.6	340
Oct-21	82.5	727	40254	442	40696	20643	727	3695	20643	725	2293699	1015	14.1	341
Nov-21	73.8	631	36108	528	36636	19989	631	4375	19989	629	2293699	913	12.8	314
Dec-21	85.7	744	41686	1590	43276	19665	744	10050	19665	744	2293699	1027	14.4	341

COG-1 (a-n)	STG 1		STG 2		Plant Load	600# Steam				150# Steam			
Subsection:	h	i	h	i	j	k				k			
	MW	Hours	MW	Hours	MW	mlb/hr	Hours	PSIG	deg F	mlb/hr	Hours	PSIG	deg F
Jan-20	15	733	1	63	81	1136	744	620	750	0.106	744	152	358
Feb-20	10	436	6	245	83	1117	672	620	750	0.106	672	152	358
Mar-20	15	735	0	0	82	1125	744	620	749	0.109	744	152	358
Apr-20	0	15	16	708	84	1148	720	620	749	0.087	720	152	358
May-20	0	0	16	737	87	1095	744	620	749	0.079	744	152	358
Jun-20	5	177	15	611	88	1135	720	620	749	0.065	720	152	358
Jul-20	1	42	17	714	89	1094	744	620	749	0.048	744	152	358
Aug-20	0	0	19	733	89	1061	744	620	749	0.083	744	152	358
Sep-20	0	8	19	684	83	1077	720	619	749	0.358	720	152	359
Oct-20	11	374	11	375	89	1031	744	620	749	0.147	744	152	358
Nov-20	18	714	0	0	89	1068	720	620	750	0.197	720	152	358
Dec-20	0	15	15	708	87	1078	744	620	749	0.194	744	152	358

COG-1 (a-n)	Total Feedwater		Total Condensate		Aux
Subsection:	l	l	m	m	n
	mlb/hr	deg F	mlb/hr	deg F	
Jan-20	1742	250	458	-	N/A
Feb-20	1701	250	451	-	N/A
Mar-20	1604	250	440	-	N/A
Apr-20	1711	250	488	-	N/A
May-20	1682	250	463	-	N/A
Jun-20	1725	250	511	-	N/A
Jul-20	1672	250	435	-	N/A
Aug-20	1651	250	421	-	N/A
Sep-20	1651	250	478	-	N/A
Oct-20	1628	250	482	-	N/A
Nov-20	1618	250	466	-	N/A
Dec-20	1515	250	477	-	N/A

DEMAND CONFORMANCE CONDITIONS OF CERTIFICATION

DC-2 The Energy Commission shall retain jurisdiction to require ARCO to periodically report on the performance of its facility and the payments made by SCE to purchase power from the facility.

Verification: On an annual basis following construction, ARCO shall report the monthly generation provided to SCE and the monthly payments received from SCE. Payments shall be disaggregated by capacity (firm and as-available), start-up and energy. ARCO shall provide the CEC a copy of the Prescribed Dispatch Schedule for the facility.

Response: Monthly values for generation provided to SCE and monthly payments disaggregated by capacity (firm and as-available) are included in the table below. Watson no

longer follows a Prescribed Dispatch Schedule from SCE. All power is baseload firm under current PPA.

Demand Conformance Conditions of Certification DC-2				
Month	SCE Sales Volume MWh	Energy Payment \$	Capacity Payment - Firm \$	Capacity Payment - As Available \$
Jan-21	194,013	\$7,269,413.13	\$356,734.55	\$0.00
Feb-21	172,199	\$40,122,362.69	\$355,194.56	\$0.00
Mar-21	153,924	\$5,258,991.32	\$292,392.21	\$0.00
Apr-21	182,194	\$6,540,791.41	\$350,015.94	\$0.00
May-21	191,870	\$6,806,381.26	\$356,232.96	\$0.00
Jun-21	181,174	\$8,875,489.82	\$3,712,862.01	\$0.00
Jul-21	185,437	\$11,274,822.60	\$3,790,164.81	\$0.00
Aug-21	185,300	\$11,164,564.13	\$3,790,130.74	\$0.00
Sep-21	161,609	\$11,925,991.17	\$2,837,845.22	\$0.00
Oct-21	191,417	\$11,174,273.32	\$353,569.67	\$0.00
Nov-21	170,019	\$9,536,452.04	\$316,411.78	\$0.00
Dec-21	135,886	\$9,149,258.54	\$351,392.46	\$0.00
Total	2,105,042	\$139,098,791.43	\$16,862,946.91	\$0.00

PUBLIC HEALTH CONDITIONS OF CERTIFICATION

PH-2 APPC shall comply with all emission regulations established by the U.S. Environmental Protection Agency (EPA), South Coast Air Quality Management District (SCAQMD), and the California Air Resources Board (CARB) regarding the use of a non-chromium treatment method as an anti-fouling/corrosive agent in the cooling towers, and the prohibition of Hexavalent Chromium additives.

Verification: APPC shall submit to the CEC, within the Annual Compliance Report, documentation of their compliance with all EPA, SCAQMD, and CARB emission regulations for use of antifouling/corrosive agents in the cooling towers.

Response: In compliance with EPA, SCAQMD and CARB emission regulations for the use of antifouling/corrosive agents in cooling towers, APPC/Watson does not use any chemical products that contain chromium in its cooling towers. It is currently using Solenis Performax CC6200, a non-chromium product, as an anti-fouling agent in its cooling towers.

POWER PLANT RELIABILITY CONDITIONS OF CERTIFICATION

RELI-3 APPC shall file with the CEC an annual report documenting the plant availability and capacity factors achieved.

Verification: Beginning with commercial operation, APPC shall file an annual report containing the following:

- a. Operating hours, outage hours, cause of outage and downtime for each piece of major equipment including the following:
 - Combustion turbine/generators - Heat recovery steam generators
 - Feedwater pumps
 - Steam turbine/generators
 - Condensers
 - Condensate pumps
 - Cooling water pumps
 - Controls
- b. For each forced outage, a precise identification of the equipment whose failure resulted in the forced outage and the resulting forced outage hours.
- c. Identification of equipment or other causes (such as curtailment) for which planned outage was instituted in any given month.
- d. Annual plant availability and capacity factors, per EPRI definitions.

Response: Information regarding operating hours, outage causes, downtime and annual plant availability and capacity factors are shown in the two tables below.

RELI-3: Power Plant Reliability - 2021					
CEC Generator Unit ID	Event Type	Start Date	End Date	Duration	Cause Code
GN91	U2 - Forced - Delayed	09/22/2021 08:27 PPT	10/01/2021 11:58 PPT	3:31	6090 - Other HRSG tube Problems
GN91	U2 - Forced - Delayed	11/28/2021 00:50 PPT	12/02/2021 16:38 PPT	15:48	6090 - Other HRSG tube Problems
GN92	MO - Maintenance	04/09/2021 21:00 PPT	04/13/2021 12:11 PPT	87:11:00	6090 - Other HRSG tube Problems
GN92	U1 - Forced - Immediate	06/21/2021 20:38 PPT	06/24/2021 02:46 PPT	54:08:00	4700 - Generator voltage control
GN92	U2 - Forced - Delayed	07/14/2021 23:21 PPT	07/15/2021 08:42 PPT	9:21:00	3649 - Other AC instrument power problems
GN92	U3 - Forced - Postponed	09/18/2021 11:07 PPT	09/23/2021 09:42 PPT	22:35	4805 - Generator Bus Duct Cooling System
GN92	MO - Maintenance	11/20/2021 08:12 PPT	11/20/2021 15:17 PPT	7:05:00	3610 - Switchyard circuit breakers - (not outside management control)
GN93	U1 - Forced - Immediate	02/12/2021 15:05 PPT	02/13/2021 12:16 PPT	21:11	5041 - Fuel piping and valves A
GN93	PO - Planned	11/26/2021 21:08 PPT	11/27/2021 21:33 PPT	0:25	5260 - Major overhaul (use for non-specific overhaul only; see page B-1) A
GN93	PO - Planned	12/03/2021 11:50 PPT	01/01/2022 00:00 PPT	684:10:00	5260 - Major overhaul (use for non-specific overhaul only; see page B-1) A
GN94	PO - Planned	03/05/2021 21:05 PPT	03/19/2021 14:40 PPT	16:35	5670 - Hot end inspection A
GN94	U1 - Forced - Immediate	03/19/2021 15:08 PPT	03/20/2021 01:32 PPT	10:24:00	4307 - Automatic turbine control systems - electro-hydraulic - digital
GN94	U2 - Forced - Delayed	03/20/2021 09:13 PPT	03/20/2021 21:27 PPT	12:14:00	0530 - Other main steam system problems
GN94	U1 - Forced - Immediate	03/22/2021 05:17 PPT	03/29/2021 12:38 PPT	7:21	4307 - Automatic turbine control systems - electro-hydraulic - digital
GN94	U1 - Forced - Immediate	10/05/2021 17:10 PPT	10/06/2021 10:52 PPT	17:42:00	3980 - Programmable Logic Controller (PLC)
GN94	U2 - Forced - Delayed	11/05/2021 21:17 PPT	11/09/2021 14:40 PPT	90:23:00	6090 - Other HRSG tube Problems
GN95	RS - Reserve Shutdown	02/01/2021 16:42 PPT	02/11/2021 07:36 PPT	230:54:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	04/01/2021 15:09 PPT	06/14/2021 13:12 PPT	1774:03:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	06/20/2021 09:10 PPT	06/28/2021 08:22 PPT	191:12:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	06/30/2021 23:02 PPT	07/12/2021 12:35 PPT	277:33:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	07/13/2021 06:12 PPT	07/26/2021 18:46 PPT	324:34:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	07/26/2021 20:13 PPT	07/27/2021 15:39 PPT	19:26:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	07/27/2021 22:07 PPT	07/28/2021 18:22 PPT	20:15:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	07/28/2021 21:05 PPT	07/29/2021 10:58 PPT	13:53:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	07/30/2021 22:07 PPT	08/15/2021 18:10 PPT	380:03:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	08/15/2021 20:04 PPT	09/08/2021 16:42 PPT	572:38:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	09/08/2021 20:31 PPT	09/09/2021 16:30 PPT	19:59:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	09/10/2021 08:05 PPT	10/01/2021 14:29 PPT	510:24:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	10/01/2021 19:02 PPT	10/16/2021 14:25 PPT	355:23:00	0000 - Reserve shutdown
GN95	RS - Reserve Shutdown	12/01/2021 15:58 PPT	01/01/2022 00:00 PPT	728:02:00	0000 - Reserve shutdown
GN96	PO - Planned	01/01/2021 00:00 PPT	01/28/2021 15:35 PPT	663:35:00	4830 - Major overhaul (720 hrs or longer) (use for non-specific overhaul only; see page B-1)
GN96	RS - Reserve Shutdown	02/11/2021 09:03 PPT	04/15/2021 13:17 PPT	1515:14:00	0000 - Reserve shutdown
GN96	U1 - Forced - Immediate	09/17/2021 19:58 PPT	09/17/2021 21:23 PPT	1:25:00	4041 - HP steam turbine thrust bearings
GN96	RS - Reserve Shutdown	09/22/2021 08:13 PPT	09/23/2021 11:52 PPT	27:39:00	0000 - Reserve shutdown
GN96	RS - Reserve Shutdown	10/16/2021 18:43 PPT	12/01/2021 15:41 PPT	1101:58:00	0000 - Reserve shutdown

RELI-3: Operating Hours and Availability - 2021		
CEC Generator Unit ID	2021 Operating Hours	2021 Availability
GN91	8,427	96.2%
GN92	8,435	96.2%
GN93	7,990	91.3%
GN94	8,125	92.8%
GN95	3,358	38.5%
GN96	5,821	66.3%

PUBLIC AND WORKER SAFETY CONDITIONS OF CERTIFICATION

SAFETY-11 APPC and the Los Angeles County Fire Department shall annually reexamine the fire protection program.

Verification: APPC shall note and summarize the joint re-examination to the fire protection program in its annual compliance report to the CEC.

Response: APPC/Watson's fire protection program is covered by a permit issued by the County of Los Angeles Fire Department and follows their standard review/renewal cycle. This review/renewal process is jointly conducted with the on-site Fire Chief responsible for the APPC/Watson facility. Fire protection equipment at the facility is inspected, tested and maintained in accordance with NFPA, ANSI and OSHA standards.

SAFETY-13 APPC shall facilitate onsite worker safety inspections conducted by Cal/DOSH during construction and operation of the facility when an employee complaint has been received.

Verification: APPC shall request Cal/DOSH to notify the CEC in writing in the event of a violation that will involve Cal/DOSH action affecting the construction and operation schedule and shall notify the CEC of the necessary corrective action. APPC shall note any Cal/DOSH inspections and actions in its periodic compliance reports.

Response: In the calendar year of 2021, APPC/Watson Cogen has not had any violations and has not received any complaints that would warrant reporting to Cal/DOSH.

TRAFFIC AND TRANSPORTATION CONDITIONS OF CERTIFICATION

TRANS-1 ARCO Petroleum Products Corporation (APPC) shall comply with the California Department of Transportation (Caltrans) and Los Angeles County restrictions on oversize or overweight vehicles using state, county and City of Carson roadways. APPC shall obtain overload permits, as necessary, from Caltrans and the County of Los Angeles.

Verification: APPC shall in its annual compliance report, notify the California Energy Commission (CEC) of any overload permits obtained from Caltrans and the County of Los Angeles.

Response: In the 2021 calendar year, APPC/Watson is not aware of any overload permits being obtained from Caltrans and the County of Los Angeles.

TRANS-2 APPC shall comply with the City of Carson encroachment and excavation permit and franchise requirements for installation of utility services (transmission line, natural gas pipeline) of the proposed project in or over city-owned rights-of-way.

Verification: APPC shall, in its annual compliance report, notify the CEC that the requirements for obtaining encroachment and excavation permits from the City of Carson have been satisfied. APPC shall file any required or requested information with the City of Carson.

Response: In the 2021 calendar year, APPC/Watson is not aware of any filings for encroachment and/or excavation permits from the City of Carson.

WASTE MANAGEMENT CONDITIONS OF CERTIFICATION

WASTE-5 If APPC intends to store hazardous wastes on-site for more than 90 days, it shall obtain a determination from DHS that the requirements of a hazardous waste facility have been satisfied. Storage of such wastes shall be in accordance with DHS regulations. APPC shall file any required or requested information with the Los Angeles County Fire Department, Hazardous Materials Unit.

Verification: APPC shall notify the CEC in the Annual Compliance Report if APPC applies for, or obtains, a Hazardous Waste Facility permit.

Response: APPC/Watson does not store bulk hazardous waste onsite for more than 90 days and therefore does not require a Hazardous Waste Facility Permit.

WASTE-6 APPC shall ensure that hazardous wastes are hauled by a permitted hazardous wastes hauler and disposed of in a proper manner at a site permitted by DHS and the Regional Water Quality Control Board, Los Angeles Region, for the disposal of hazardous wastes.

Verification: In the Annual Compliance Report, APPC shall submit to the CEC a verification that hazardous wastes have been transported by a DHS-licensed hazardous waste hauler, and that the wastes were disposed of at appropriate sites.

Response: Hazardous waste generated by APPC/Watson is transported by a DTSC licensed hazardous waste hauler and is disposed of in a proper manner at permitted hazardous waste facilities.

WATER QUALITY CONDITIONS OF CERTIFICATION

WQ-4 The project owner shall provide a copy of the revised or new National Pollutant Discharge Elimination System Permit for the Watson Cogeneration Project and the ARCO Los Angeles Refinery approved by the Los Angeles Regional Water Quality Control Board to the CEC Compliance Project Manager. The project owner shall also provide a copy of the annual monitoring report required by the NPDES Permit for all wastewater, with the exception of stormwater runoff, that is commingled with cooling tower blowdown from the Watson Cogeneration Plant and discharged to the Dominguez Channel.

Verification: The project owner shall provide a copy of the new NPDES Permit to the CEC Compliance Project Manager within one month of its approval by the Los Angeles Regional Water Quality Control Board. Annual NPDES Permit monitoring reports shall be provided to the CEC Compliance Project Manager with the annual compliance report.

Response: Annual NPDES reports for the Carson facility are submitted electronically on the California Integrated Water Quality System (CIWQS). A copy of the annual NPDES report has been included at the end of this annual compliance report. A copy of the updated NPDES permit can be provided if requested by the CEC.

WATER RESOURCES CONDITIONS OF CERTIFICATION

WATER-3 The project owner will demonstrate that all feasible and practical measures to reduce additional water demand have been incorporated into the design of the fifth train. The measures may include, but are not limited to, recycling and reuse.

Verification: The project owner shall submit a report discussing all measures, whether adopted or not, considered to reduce project water demand. This report shall be contained in the first annual compliance report following the start of operation of the fifth train.

Response: Water-3 is not applicable as APPC/Watson did not construct a fifth train.



Nate Busch
Environmental Department

Tesoro Refining & Marketing Company LLC
A subsidiary of Marathon Petroleum Corporation

Los Angeles Refinery – Carson Operations
2350 E. 223rd Street
Carson, California 90810
310-816-8100

January 31, 2022

VIA CIWQS Upload

California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

NPDES Permit No. CA0000680
Order No. R4-2015-0259

**NO DISCHARGE DURING
REPORTING PERIOD**

Re: 2021 Annual NPDES Self-Monitoring Report
Tesoro Refining and Marketing Company LLC
Los Angeles Refinery – Carson Operations
1801 East Sepulveda Boulevard, Carson, California

To Whom It May Concern:

Please find enclosed the Annual NPDES Self-Monitoring Report for the Tesoro Los Angeles Refinery – Carson Operations for the period of January 1, 2021 through December 31, 2021.

During the 2021 reporting period all process wastewater and wastewater commingled with storm water was discharged to the Los Angeles Sanitation District (LACSD) in compliance with Industrial Wastewater Permit No. 21299. Discharge of Low Volume Waste to the Dominguez Channel from any of the permitted Outfalls did not occur during the 2021 reporting period.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact me at 310-847-3920.

Sincerely,

Nate Busch
HES Professional

ecc: 2021 LARC Annual NPDES Report

NPDES Annual Self-Monitoring Report

**Tesoro Refining & Marketing Company LLC
Tesoro Los Angeles Refinery – Carson Operations
1801 East Sepulveda Boulevard
Carson, California 90749**

**NPDES Permit No. CA0000680
Order No. R4-2015-0259**

**Reporting Period:
January 1, 2021 – December 31, 2021**

**Report Prepared On:
January 31, 2022**

Table of Contents

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Attachments

Attachment 1: Annual Comprehensive Site Compliance Evaluation

Attachment 2: Annual Rainfall Data

Attachment 3: Sediment Monitoring Report

Part 1 – Compliance Summary

1. NPDES Permit Compliance Summary

There were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 to the Dominguez Channel at the Los Angeles Refinery – Carson Operations (LARC) in calendar year 2021. Therefore, there were no violations of the discharge limits or Waste Discharge Requirements (WDRs).

2. NPDES Incident Release Report

There were no incidental releases to the Dominguez Channel Estuary during calendar year 2021.

Part 2 – Summary of Monitoring Parameters

1. Presentation of Effluent Monitoring Data

There were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 to the Dominguez Channel Estuary at LARC in calendar year 2021. Therefore, no effluent monitoring was required.

2. Changes in Discharge

There were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 to the Dominguez Channel at LARC in calendar year 2021. There were no changes in the discharge as described in Order R4-2015-0259.

Part 3 – Other Monitoring

1. SWPPP, BMPP, and Spill Contingency Plan and Effectiveness Report

There were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 to the Dominguez Channel Estuary at LARC in calendar year 2021. Therefore, there were no issues with the effectiveness of the SWPPP, BMPP, or Spill Contingency Plan.

However, internal policy dictates the annual review of all facility environmental plans. The Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices Plan (BMPP) were reviewed in November 2021 (see Attachment 1). The Spill Contingency Plan (Spill Prevention Control & Countermeasure (SPCC) Plan) was reviewed in December 2021.

2. Chemical Use Report

See Table 2 for the chemical usage report summarizing the quantities of all chemicals which are used at the facility and which are discharged or have the potential to be discharged. There were no discharges of Low Volume Wastes, including chemicals,

through Discharge Points 001, 002, 003, 004 or 005 to the Dominguez Channel Estuary at LARC in calendar year 2021. The Refinery diverts cooling tower blowdown, boiler blowdown, and commingled storm water / wastewater to the wastewater treatment system before discharging to the Los Angeles County Sanitation District (LACSD Permit No. 21299).

TABLE 2: 2021 Chemical Usage

Baker Hughes Chemical	Description	2021 Usage (lb)
LFS3301R	Dispersant	165964
BPR45142	Antifoam	15322
BPR81300	Filmer	13039
BPR81232	Filmer	77728
BPR44865R1	Dispersant/Settling Aid	34517
BPR27140	Demulsifier	156354
BPR81156R	Neutralizer	226397
XERIC7021	Demulsifier	5300
LFS3758	Antifoulant	14435
FSTP5025	Antifoam	58437
T9715	Silver Strip	202
T4695	Antioxidant	43088
SX9252	H2S Scavenger	25500
SX9200	H2S Scavenger	3524
SX9272M	H2S Scavenger	3175
XCIDE102	Biocide	80
T1347	Cetane Improver	391090
Performax DC5511	Dispersant	208491
Millisperse MS7400	CS corrosion inhibitor	105009
Performax CC6200	Yellow metal corrosion inhibitor	94000
Performax SR8315	Biodispersant	25626
Biosperse CN2150	Biocide	21292
Drewplus L-718	Antifoam	11783
Drewgard 315	Closed Loop	3253

3. Receiving Water Monitoring

There were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 to the Dominguez Channel Estuary at LARC in calendar year 2021. Therefore, no receiving water sampling and associated visual observation was required.

Visual observations of the upstream and downstream receiving water sampling points was performed during 2021. Visual observations were performed at least monthly during January through December. No findings related to facility operations were reported on the visual observation logs.

4. Annual Comprehensive Compliance Evaluation

The Annual Comprehensive Compliance Evaluation (ACCE) was conducted by qualified personnel on January 20, 2022. See Attachment 1 for documentation.

5. Storm Water / Rainfall Monitoring

The daily rainfall data for calendar year 2021 are included in Attachment 2.

6. Sediment Monitoring

Although there were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 to the Dominguez Channel at LARC in calendar year 2021, sediment monitoring was conducted on September 8, 2021 and November 3, 2021. A copy of the report is included in Attachment 3.

Certification

We report that there were no discharges of Low Volume Wastes through Discharge Points 001, 002, 003, 004 or 005 or Process Wastewater Commingled with Storm Water and Boiler Blowdown through Discharge Points 003 or 004 at LARC to the Dominguez Channel during the reporting period of January 1, 2021 – December 31, 2021, under the above-mentioned order.

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Robert Nguyen

(Print Name)

Environmental Manager

(Title)

Certified via CIWQS

(Signature)

Attachment 1

Annual Comprehensive Site Compliance Evaluation (ACSCE)				
Facility Name:	LAR – Carson Operations	Date:	1/25/22	Page 1 of 2
Inspector's Name/Signature:	Nate Busch	Inspector's Title:	HES Professional	
Has it been 8-16 months since the last Annual Evaluation?				☒ YES ☐ NO ☐ N/A
Was a review of all sampling, visual observations, and inspection records conducted during the previous reporting year?				☒ YES ☐ NO ☐ N/A
Were all industrial activities and associated potential pollutants sources inspected for evidence of, or the potential for, entering the storm water conveyance system?				☒ YES ☐ NO ☐ N/A
Were all drainage areas previously identified as having no exposure to industrial activities and materials inspected?				☒ YES ☐ NO ☐ N/A
Was all equipment used to implement BMPs inspected?				☒ YES ☐ NO ☐ N/A
Were all BMPs inspected?				☒ YES ☐ NO ☐ N/A
Was the Storm Water Pollution Prevention Plan and Monitoring Implementation Plan reviewed?				☒ YES ☐ NO ☐ N/A
Are revisions to the Storm Water Pollution Prevention Plan and Monitoring Implementation Plan needed?				☐ YES ☒ NO ☐ N/A

[illegible]

Annual Comprehensive Site Compliance Evaluation (ACSCE) continued

Attach an explanation page if more room is needed. Please make copy of form if more rows are needed.

Page 2 of 2

Potential Pollutant Source/Industrial Activity (as identified in your SWPPP) Northeast Area -Flares -Cooling Towers -Ineos -Discharge Points 1, 2, & 3	Have any BMPs not been fully implemented? Are any BMPs not effective in reducing and preventing pollutants in storm water discharges and NSWDS? Are additional/revised BMPs necessary?	☐ YES ☒ NO ☐ YES ☒ NO ☐ YES ☒ NO	If yes, to any of the three questions, complete the next two columns of this form.	Describe deficiencies in BMPs or BMP implementation	Describe additional/revised BMPs or corrective actions and their date(s) of implementation
Potential Pollutant Source/Industrial Activity (as identified in your SWPPP) Northwest Area -Flares -Cooling Towers -Cogen -Maintenance -Discharge Points 4 & 5	Have any BMPs not been fully implemented? Are any BMPs not effective in reducing and preventing pollutants in storm water discharges and NSWDS? Are additional/revised BMPs necessary?	☐ YES ☒ NO ☐ YES ☒ NO ☐ YES ☒ NO	If yes, to any of the three questions, complete the next two columns of this form.	Describe deficiencies in BMPs or BMP implementation	Describe additional/revised BMPs or corrective actions and their date(s) of implementation
Potential Pollutant Source/Industrial Activity (as identified in your SWPPP) Tank Farms	Have any BMPs not been fully implemented? Are any BMPs not effective in reducing and preventing pollutants in storm water discharges and NSWDS? Are additional/revised BMPs necessary?	☐ YES ☒ NO ☐ YES ☒ NO ☐ YES ☒ NO	If yes, to any of the three questions, complete the next two columns of this form.	Describe deficiencies in BMPs or BMP implementation	Describe additional/revised BMPs or corrective actions and their date(s) of implementation

Attachment 2

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

967

CXUS56 KLOX 011255

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA

MONTH: JANUARY

YEAR: 2021

LATITUDE: 33 49 N

LONGITUDE: 118 9 W

TEMPERATURE IN F:						:PCPN:		SNOW:		WIND		:SUNSHINE:		SKY		:PK WND		
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
12Z AVG MX 2MIN																		
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	70	43	57	1	8	0	0.00	M	M	3.7	14	290	M	M	0	8	16	290
2	62	46	54	-2	11	0	0.00	M	M	1.8	8	170	M	M	0	1	13	290
3	60	47	54	-2	11	0	0.00	M	M	2.1	9	200	M	M	5	128	11	200
4	63	47	55	-1	10	0	0.00	M	M	2.7	17	300	M	M	2	18	20	300
5	63	49	56	0	9	0	0.00	M	M	2.3	8	170	M	M	4	18	11	210
6	68	46	57	1	8	0	0.00	M	M	2.2	10	150	M	M	1	128	12	160
7	70	46	58	2	7	0	0.00	M	M	1.4	12	180	M	M	3	128	15	180
8	64	48	56	-1	9	0	0.00	M	M	2.4	10	190	M	M	5	128	12	190
9	73	43	58	1	7	0	0.00	M	M	1.9	10	320	M	M	4	128	12	310
10	72	48	60	3	5	0	0.00	M	M	3.2	13	290	M	M	0		15	290
11	75	44	60	3	5	0	0.00	M	M	3.2	14	290	M	M	0		17	300
12	72	44	58	1	7	0	0.00	M	M	2.3	12	310	M	M	0		14	310
13	77	43	60	3	5	0	0.00	M	M	3.2	14	290	M	M	0		17	290
14	83	49	66	9	0	1	0.00	M	M	2.8	10	160	M	M	0		13	150
15	91	49	70	13	0	5	0.00	M	M	3.4	9	310	M	M	0		11	280
16	82	49	66	9	0	1	0.00	M	M	2.6	12	200	M	M	0		14	200
17	87	53	70	13	0	5	0.00	M	M	3.0	12	290	M	M	0		15	70
18	74	48	61	4	4	0	0.00	M	M	3.8	10	130	M	M	2	1	16	140
19	69	52	61	4	4	0	0.00	M	M	10.8	32	80	M	M	5	8	43	70
20	77	56	67	10	0	2	0.00	M	M	9.7	23	80	M	M	2		29	80
21	68	53	61	4	4	0	0.00	M	M	3.6	13	200	M	M	0		15	190
22	61	52	57	0	8	0	0.00	M	M	6.2	15	220	M	M	7		19	240
23	54	46	50	-7	15	0	0.37	M	M	3.0	12	290	M	M	8	13	16	270
24	58	41	50	-7	15	0	T	M	M	4.5	16	260	M	M	4	123	21	270
25	55	41	48	-9	17	0	0.17	M	M	13.3	31	290	M	M	3	1	43	280
26	56	39	48	-9	17	0	0.00	M	M	5.2	13	210	M	M	1		17	200
27	59	46	53	-4	12	0	0.00	M	M	6.0	14	120	M	M	5		18	140
28	61	43	52	-5	13	0	0.49	M	M	6.5	17	290	M	M	1	1	23	140
29	57	46	52	-5	13	0	0.34	M	M	4.5	15	340	M	M	8	13	18	310
30	63	42	53	-4	12	0	0.00	M	M	2.7	12	290	M	M	0	1	13	280
31	71	47	59	2	6	0	0.00	M	M	4.5	10	300	M	M	0		13	280
=====																		
SM	2115	1446			242	14	1.37	M		128.5			M		70			
=====																		
AV	68.2	46.6								4.1	FASTST		M	M	2	MAX(MPH)		

MISC ----> 32 80

43 70

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
 MONTH: JANUARY
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 57.4
 DPTR FM NORMAL: 0.7
 HIGHEST: 91 ON 15
 LOWEST: 39 ON 26

[PRECIPITATION DATA]

TOTAL FOR MONTH: 1.37
 DPTR FM NORMAL: -1.23
 GRTST 24HR 2.32 ON 28-29
 SNOW, ICE PELLETS, HAIL
 TOTAL MONTH: M
 GRTST 24HR M ON M
 GRTST DEPTH: M ON M

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
 2 = FOG REDUCING VISIBILITY
 TO 1/4 MILE OR LESS
 3 = THUNDER
 4 = ICE PELLETS
 5 = HAIL
 6 = FREEZING RAIN OR DRIZZLE
 7 = DUSTSTORM OR SANDSTORM:
 VSBY 1/2 MILE OR LESS
 8 = SMOKE OR HAZE
 9 = BLOWING SNOW
 X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
 MAX 90 OR ABOVE: 1
 MIN 32 OR BELOW: 0
 MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 4
 0.10 INCH OR MORE: 4
 0.50 INCH OR MORE: 0
 1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 242
 DPTR FM NORMAL -17
 TOTAL FM JUL 1 579
 DPTR FM NORMAL -97

CLEAR (SCALE 0-3) 19
 PTCLDY (SCALE 4-7) 12
 CLOUDY (SCALE 8-10) 0

[CDD (BASE 65)]

TOTAL THIS MO. 14
 DPTR FM NORMAL 11
 TOTAL FM JAN 1 14
 DPTR FM NORMAL 11

[PRESSURE DATA]

HIGHEST SLP 30.29 ON 12
 LOWEST SLP 29.69 ON 25

[REMARKS]

#FINAL-01-21#

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

Climatological Report (Monthly)

410

CXUS56 KLOX 011730

CLMLGB

CLIMATE REPORT

NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD

930 AM PST MON FEB 01 2021

 ...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF JANUARY 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010

CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR'S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

 TEMPERATURE (F)

HIGHEST	91	01/15			
LOWEST	39	01/26			
AVG. MAXIMUM	68.2		67.4	0.8	
AVG. MINIMUM	46.6		46.1	0.5	
MEAN	57.4		56.7	0.7	
DAYS MAX >= 90	1				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	1.37		2.60	-1.23	
DAILY AVG.	0.04				
DAYS >= .01	4				
DAYS >= .10	4				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	0.83	01/28 TO 01/29			
STORM TOTAL	0.49				

DEGREE DAYS

HEATING TOTAL	242		259	-17	262
SINCE 7/1	579		676	-97	644
COOLING TOTAL	14		3	11	0
SINCE 1/1	14		3	11	0

 WIND (MPH)

AVERAGE WIND SPEED	4.1				
HIGHEST WIND SPEED/DIRECTION	32/080	DATE	01/19		
HIGHEST GUST SPEED/DIRECTION	43/070	DATE	01/19		
	43/280		01/25		

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM

AVERAGE SKY COVER 0.22

NUMBER OF DAYS FAIR 21

NUMBER OF DAYS PC 8

NUMBER OF DAYS CLOUDY 2

AVERAGE RH (PERCENT) 61

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM 3 MIXED PRECIP 0

HEAVY RAIN 1 RAIN 4

LIGHT RAIN 5 FREEZING RAIN 0

LT FREEZING RAIN 0 HAIL 0

HEAVY SNOW 0 SNOW 0

LIGHT SNOW 0 SLEET 0

FOG 15 FOG W/VIS <= 1/4 MILE 6

HAZE 9

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

353

CXUS56 KLOX 011255

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
 MONTH: FEBRUARY
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

TEMPERATURE IN F:										PCPN:	SNOW:	WIND		SUNSHINE:	SKY	PK WND		
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
										12Z	AVG	MX	2MIN					
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	71	57	64	7	1	0	T	M	M	4.1	12	300	M	M	6		13	300
2	70	51	61	4	4	0	0.00	M	M	4.5	18	300	M	M	2		20	290
3	65	50	58	1	7	0	0.00	M	M	3.8	14	280	M	M	4	128	18	270
4	67	50	59	2	6	0	0.00	M	M	4.2	13	290	M	M	5	1	14	290
5	70	48	59	2	6	0	0.00	M	M	3.3	13	290	M	M	0	18	14	290
6	74	45	60	3	5	0	0.00	M	M	2.6	10	290	M	M	0	18	12	300
7	64	48	56	-1	9	0	0.00	M	M	3.3	9	200	M	M	4	128	11	210
8	59	50	55	-2	10	0	0.00	M	M	4.0	12	200	M	M	6	18	14	170
9	59	53	56	-1	9	0	0.00	M	M	4.1	10	180	M	M	7		14	170
10	62	50	56	-1	9	0	0.00	M	M	2.4	10	210	M	M	5	18	14	230
11	65	46	56	-1	9	0	0.00	M	M	3.9	15	290	M	M	0	18	18	290
12	67	51	59	2	6	0	0.05	M	M	8.0	29	310	M	M	4	1	34	310
13	62	50	56	-1	9	0	0.00	M	M	7.3	18	320	M	M	5		24	290
14	70	53	62	4	3	0	0.00	M	M	13.8	28	290	M	M	0		32	290
15	62	48	55	-3	10	0	0.00	M	M	4.0	13	180	M	M	1		18	170
16	70	52	61	3	4	0	0.00	M	M	7.2	23	320	M	M	3	18	29	320
17	66	46	56	-2	9	0	0.00	M	M	4.0	17	260	M	M	0		24	260
18	70	50	60	2	5	0	0.00	M	M	7.8	20	80	M	M	0		25	80
19	71	44	58	0	7	0	0.00	M	M	3.1	13	290	M	M	0		14	220
20	72	45	59	1	6	0	0.00	M	M	7.8	30	310	M	M	1		37	350
21	76	44	60	2	5	0	0.00	M	M	5.8	18	290	M	M	0		21	280
22	84	49	67	9	0	2	0.00	M	M	5.6	16	300	M	M	0		25	90
23	75	47	61	3	4	0	0.00	M	M	3.4	12	310	M	M	0	1	14	280
24	67	50	59	1	6	0	0.00	M	M	3.6	10	210	M	M	1	1	M	M
25	77	48	63	5	2	0	0.00	M	M	3.8	14	290	M	M	1	18	17	310
26	72	44	58	0	7	0	0.00	M	M	3.5	13	200	M	M	0		16	220
27	69	48	59	1	6	0	0.00	M	M	4.4	16	290	M	M	2		20	290
28	74	47	61	3	4	0	0.00	M	M	6.6	21	80	M	M	0		27	80
=====																		
SM	1930	1364			168	2	0.05	M		139.9			M		57			
=====																		
AV	68.9	48.7								5.0	FASTST	M	M	2		MAX(MPH)		
										MISC	---->	30	310			37	350	
=====																		

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
 MONTH: FEBRUARY
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

[TEMPERATURE DATA]

[PRECIPITATION DATA]

SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 58.8
 DPTR FM NORMAL: 1.2
 HIGHEST: 84 ON 22
 LOWEST: 44 ON 26,21

TOTAL FOR MONTH: 0.05
 DPTR FM NORMAL: -3.04
 GRTST 24HR 0.05 ON 12-12

1 = FOG OR MIST
 2 = FOG REDUCING VISIBILITY
 TO 1/4 MILE OR LESS
 3 = THUNDER
 4 = ICE PELLETS
 5 = HAIL
 6 = FREEZING RAIN OR DRIZZLE
 7 = DUSTSTORM OR SANDSTORM:
 VSBY 1/2 MILE OR LESS
 8 = SMOKE OR HAZE
 9 = BLOWING SNOW
 X = TORNADO

SNOW, ICE PELLETS, HAIL
 TOTAL MONTH: M
 GRTST 24HR M ON M
 GRTST DEPTH: M ON M

[NO. OF DAYS WITH]

[WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0 0.01 INCH OR MORE: 1
 MAX 90 OR ABOVE: 0 0.10 INCH OR MORE: 0
 MIN 32 OR BELOW: 0 0.50 INCH OR MORE: 0
 MIN 0 OR BELOW: 0 1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 168 CLEAR (SCALE 0-3) 18
 DPTR FM NORMAL -44 PTCLDY (SCALE 4-7) 10
 TOTAL FM JUL 1 747 CLOUDY (SCALE 8-10) 0
 DPTR FM NORMAL -145

[CDD (BASE 65)]

TOTAL THIS MO. 2
 DPTR FM NORMAL -3
 TOTAL FM JAN 1 16
 DPTR FM NORMAL 13

[PRESSURE DATA]

HIGHEST SLP 30.33 ON 18
 LOWEST SLP 29.81 ON 13

[REMARKS]

#FINAL-02-21#

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Climatological Report (Monthly)

002

CXUS56 KLOX 011730

CLMLGB

CLIMATE REPORT

NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD

930 AM PST MON MAR 01 2021

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF FEBRUARY 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010

CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR'S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

.....
TEMPERATURE (F)

HIGHEST 84 02/22

LOWEST 44 02/19

02/21

02/26

AVG. MAXIMUM 68.9 67.2 1.7

AVG. MINIMUM 48.7 48.0 0.7

MEAN 58.8 57.6 1.2

DAYS MAX >= 90 0

DAYS MAX <= 32 0

DAYS MIN <= 32 0

DAYS MIN <= 0 0

PRECIPITATION (INCHES)

TOTALS 0.07 3.09 -3.02

DAILY AVG. 0.00

DAYS >= .01 2

DAYS >= .10 0

DAYS >= .50 0

DAYS >= 1.00 0

GREATEST

24 HR. TOTAL 0.05 02/12 TO 02/12

STORM TOTAL 0.05

DEGREE DAYS

HEATING TOTAL 168 212 -44 185

SINCE 7/1 747 892 -145 829

COOLING TOTAL 2 5 -3 12

SINCE 1/1 16 3 13 12

.....
WIND (MPH)

AVERAGE WIND SPEED 5.0

HIGHEST WIND SPEED/DIRECTION 30/310 DATE 02/20

HIGHEST GUST SPEED/DIRECTION 37/350 DATE 02/20

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM
AVERAGE SKY COVER 0.20
NUMBER OF DAYS FAIR 20
NUMBER OF DAYS PC 8
NUMBER OF DAYS CLOUDY 0

AVERAGE RH (PERCENT) 59

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	1	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	13	FOG W/VIS <= 1/4 MILE	2
HAZE	9		

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

000

CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
 MONTH: MARCH
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

TEMPERATURE IN F:						:PCPN:		SNOW:		WIND		:SUNSHINE:				SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	
12Z AVG MX 2MIN																			
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR	
1	73	47	60	2	5	0	0.00	M	M	4.6	14	70	M	M	0	8	18	70	
2	73	44	59	0	6	0	0.00	M	M	4.0	12	200	M	M	0		14	200	
3	59	45	52	-7	13	0	0.48	M	M	4.7	20	40	M	M	5	13	23	40	
4	65	43	54	-5	11	0	0.00	M	M	4.7	15	290	M	M	0		19	280	
5	78	47	63	4	2	0	0.00	M	M	6.4	18	280	M	M	0		23	290	
6	68	48	58	-1	7	0	0.00	M	M	4.8	16	290	M	M	0	1	19	290	
7	62	51	57	-2	8	0	0.00	M	M	3.4	12	190	M	M	6		17	200	
8	66	51	59	0	6	0	0.00	M	M	4.8	18	290	M	M	6		22	310	
9	63	46	55	-4	10	0	0.00	M	M	6.7	23	280	M	M	1		30	290	
10	59	48	54	-5	11	0	0.60	M	M	7.1	20	280	M	M	7	13	26	290	
11	57	45	51	-8	14	0	0.21	M	M	4.6	14	220	M	M	4	1	19	230	
12	60	42	51	-8	14	0	0.00	M	M	4.9	18	290	M	M	1		21	300	
13	62	45	54	-5	11	0	0.00	M	M	4.6	15	290	M	M	2	8	21	250	
14	61	51	56	-3	9	0	0.00	M	M	6.0	16	290	M	M	8		18	290	
15	57	47	52	-8	13	0	0.18	M	M	12.6	25	290	M	M	6	1	40	250	
16	58	45	52	-8	13	0	0.00	M	M	5.9	15	290	M	M	0		M	M	
17	65	44	55	-5	10	0	0.00	M	M	3.9	13	300	M	M	0		M	M	
18	67	48	58	-2	7	0	0.00	M	M	4.5	17	290	M	M	0		M	M	
19	72	49	61	1	4	0	0.00	M	M	5.5	18	290	M	M	0		24	290	
20	65	52	59	-1	6	0	0.00	M	M	4.7	17	290	M	M	3	1	20	290	
21	68	49	59	-1	6	0	0.00	M	M	5.3	18	280	M	M	0		23	290	
22	65	48	57	-3	8	0	0.00	M	M	4.9	13	300	M	M	0		16	180	
23	68	53	61	1	4	0	0.00	M	M	9.9	30	290	M	M	3		36	290	
24	73	47	60	0	5	0	0.00	M	M	7.2	21	280	M	M	0	1	32	260	
25	60	52	56	-4	9	0	0.00	M	M	7.5	13	260	M	M	6		21	280	
26	65	48	57	-3	8	0	0.00	M	M	5.2	17	290	M	M	2		23	290	
27	79	47	63	3	2	0	0.00	M	M	4.8	15	300	M	M	0		M	M	
28	89	50	70	10	0	5	0.00	M	M	5.4	23	290	M	M	0		27	290	
29	74	51	63	3	2	0	0.00	M	M	4.5	15	200	M	M	0		21	210	
30	69	54	62	1	3	0	0.00	M	M	5.5	13	200	M	M	3		17	170	
31	88	53	71	10	0	6	0.00	M	M	5.7	20	80	M	M	0	18	25	80	
=====																			
SM	2088	1490			227	11	1.47	M		174.4			M		63				
=====																			
AV	67.4	48.1								5.6	FASTST		M	M	2		MAX(MPH)		

MISC ----> 30 290

40 250

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
 MONTH: MARCH
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 57.7
 DPTR FM NORMAL: -1.9
 HIGHEST: 89 ON 28
 LOWEST: 42 ON 12

[PRECIPITATION DATA]

TOTAL FOR MONTH: 1.47
 DPTR FM NORMAL: -0.40
 GRTST 24HR 0.66 ON 10-11
 SNOW, ICE PELLETS, HAIL
 TOTAL MONTH: M
 GRTST 24HR M ON M
 GRTST DEPTH: M ON M

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
 2 = FOG REDUCING VISIBILITY
 TO 1/4 MILE OR LESS
 3 = THUNDER
 4 = ICE PELLETS
 5 = HAIL
 6 = FREEZING RAIN OR DRIZZLE
 7 = DUSTSTORM OR SANDSTORM:
 VSBY 1/2 MILE OR LESS
 8 = SMOKE OR HAZE
 9 = BLOWING SNOW
 X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
 MAX 90 OR ABOVE: 0
 MIN 32 OR BELOW: 0
 MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 4
 0.10 INCH OR MORE: 4
 0.50 INCH OR MORE: 1
 1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 227
 DPTR FM NORMAL 48
 TOTAL FM JUL 1 974
 DPTR FM NORMAL -95

CLEAR (SCALE 0-3) 22
 PTCLDY (SCALE 4-7) 8
 CLOUDY (SCALE 8-10) 1

[CDD (BASE 65)]

TOTAL THIS MO. 11
 DPTR FM NORMAL 1
 TOTAL FM JAN 1 27
 DPTR FM NORMAL 9

[PRESSURE DATA]

HIGHEST SLP 30.28 ON 14
 LOWEST SLP 29.78 ON 23

[REMARKS]

#FINAL-03-21#

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

Climatological Report (Monthly)

000

CXUS56 KLOX 011630

CLMLGB

CLIMATE REPORT

NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD

930 AM PDT THU APR 01 2021

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF MARCH 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010

CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR'S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

TEMPERATURE (F)

HIGHEST	89	03/28			
LOWEST	42	03/12			
AVG. MAXIMUM	67.4		68.6	-1.2	
AVG. MINIMUM	48.1		50.5	-2.4	
MEAN	57.8		59.6	-1.8	
DAYS MAX $\geq$ 90	0				
DAYS MAX $\leq$ 32	0				
DAYS MIN $\leq$ 32	0				
DAYS MIN $\leq$ 0	0				

PRECIPITATION (INCHES)

TOTALS	1.47		1.87	-0.40	
DAILY AVG.	0.05				
DAYS $\geq$.01	4				
DAYS $\geq$.10	4				
DAYS $\geq$.50	1				
DAYS $\geq$ 1.00	0				
GREATEST					
24 HR. TOTAL	0.66	03/10 TO 03/11			
STORM TOTAL	0.60				

DEGREE DAYS

HEATING TOTAL	227	179	48	199
SINCE 7/1	974	1069	-95	1028
COOLING TOTAL	11	10	1	1
SINCE 1/1	27	18	9	13

WIND (MPH)

AVERAGE WIND SPEED	5.6			
HIGHEST WIND SPEED/DIRECTION	30/290	DATE	03/23	
HIGHEST GUST SPEED/DIRECTION	40/250	DATE	03/15	

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM
AVERAGE SKY COVER 0.21
NUMBER OF DAYS FAIR 23
NUMBER OF DAYS PC 7
NUMBER OF DAYS CLOUDY 1

AVERAGE RH (PERCENT) 61

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	2	MIXED PRECIP	0
HEAVY RAIN	3	RAIN	3
LIGHT RAIN	4	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	8	FOG W/VIS <= 1/4 MILE	0
HAZE	3		

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

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CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA

MONTH: APRIL

YEAR: 2021

LATITUDE: 33 49 N

LONGITUDE: 118 9 W

TEMPERATURE IN F:										:PCPN:		SNOW:		WIND		:SUNSHINE:		SKY		:PK WND			
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18					
										12Z	AVG	MX	2MIN										
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR					
1	90	59	75	14	0	10	0.00	M	M	5.9	21	290	M	M	0		25	290					
2	66	55	61	0	4	0	0.00	M	M	6.1	14	150	M	M	2	1	18	150					
3	73	54	64	3	1	0	0.00	M	M	4.9	13	280	M	M	4	18	M	M					
4	75	50	63	2	2	0	0.00	M	M	4.1	14	290	M	M	1	18	16	290					
5	68	53	61	0	4	0	0.00	M	M	5.6	12	310	M	M	2		M	M					
6	68	55	62	1	3	0	0.00	M	M	4.8	13	300	M	M	4		15	180					
7	76	54	65	4	0	0	0.00	M	M	4.3	15	290	M	M	0		M	M					
8	73	54	64	2	1	0	0.00	M	M	5.0	18	300	M	M	1	18	22	310					
9	71	53	62	0	3	0	0.00	M	M	5.4	9	300	M	M	3	1	M	M					
10	75	54	65	3	0	0	0.00	M	M	5.2	10	300	M	M	2	1	M	M					
11	69	57	63	1	2	0	0.00	M	M	5.4	10	150	M	M	7	8	M	M					
12	66	58	62	0	3	0	0.00	M	M	6.7	13	220	M	M	10		16	220					
13	64	57	61	-1	4	0	T	M	M	6.9	14	220	M	M	10		18	200					
14	63	54	59	-3	6	0	0.00	M	M	6.9	13	220	M	M	4		19	190					
15	67	49	58	-4	7	0	0.00	M	M	6.2	17	290	M	M	2		25	290					
16	69	54	62	0	3	0	0.00	M	M	5.2	15	200	M	M	3	8	17	210					
17	71	54	63	0	2	0	0.00	M	M	4.7	14	300	M	M	3		18	260					
18	87	54	71	8	0	6	0.00	M	M	7.2	25	270	M	M	0	18	33	280					
19	85	54	70	7	0	5	0.00	M	M	4.3	18	280	M	M	0		22	290					
20	64	57	61	-2	4	0	0.00	M	M	7.6	13	120	M	M	5		19	190					
21	66	57	62	-1	3	0	0.01	M	M	6.5	16	160	M	M	9		23	200					
22	62	58	60	-3	5	0	0.00	M	M	5.8	12	290	M	M	10		M	M					
23	65	57	61	-2	4	0	0.00	M	M	5.4	13	200	M	M	8		17	190					
24	66	55	61	-3	4	0	0.00	M	M	5.5	15	300	M	M	7		19	290					
25	66	55	61	-3	4	0	T	M	M	7.3	18	290	M	M	5		22	290					
26	66	55	61	-3	4	0	0.01	M	M	8.7	17	290	M	M	7		24	270					
27	67	53	60	-4	5	0	0.00	M	M	6.0	16	280	M	M	2	8	20	280					
28	84	51	68	4	0	3	0.00	M	M	7.2	25	280	M	M	0		33	290					
29	89	55	72	8	0	7	0.00	M	M	5.7	22	290	M	M	0		27	280					
30	89	58	74	10	0	9	0.00	M	M	5.3	15	300	M	M	0		20	280					
=====																							
SM	2160	1643			78	40	0.02	M		175.8			M		111								
=====																							
AV	72.0	54.8								5.9	FASTST		M	M	4		MAX(MPH)						
=====																							
MISC ----> # 25 270 # 33 280																							

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NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
MONTH: APRIL
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

[TEMPERATURE DATA]

[PRECIPITATION DATA]

SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 63.4
DPTR FM NORMAL: 1.0
HIGHEST: 90 ON 1
LOWEST: 49 ON 15

TOTAL FOR MONTH: 0.02
DPTR FM NORMAL: -0.58
GRTST 24HR 0.01 ON 21-21

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: M
GRTST 24HR M ON M
GRTST DEPTH: M ON M

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY
TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM:
VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

[WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 1
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

0.01 INCH OR MORE: 2
0.10 INCH OR MORE: 0
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 78
DPTR FM NORMAL -28
TOTAL FM JUL 1 1052
DPTR FM NORMAL -124

CLEAR (SCALE 0-3) 17
PTCLDY (SCALE 4-7) 8
CLOUDY (SCALE 8-10) 5

[CDD (BASE 65)]

TOTAL THIS MO. 40
DPTR FM NORMAL 11
TOTAL FM JAN 1 67
DPTR FM NORMAL 20

[PRESSURE DATA]

HIGHEST SLP 30.14 ON 3
LOWEST SLP 29.72 ON 11

[REMARKS]

#FINAL-04-21#

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Climatological Report (Monthly)

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CXUS56 KLOX 011630
CLMLGB

CLIMATE REPORT
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD
930 AM PDT SAT MAY 01 2021

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...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF APRIL 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010
CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR'S VALUE
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TEMPERATURE (F)

HIGHEST	90	04/01			
LOWEST	49	04/15			
AVG. MAXIMUM	72.0		71.7	0.3	
AVG. MINIMUM	54.8		53.2	1.6	
MEAN	63.4		62.4	1.0	
DAYS MAX >= 90	1				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	0.02		0.60	-0.58	
DAILY AVG.	0.00				
DAYS >= .01	0				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	0.01	04/21 TO 04/21			
		04/26 TO 04/26			
		04/21 TO 04/21			
		04/26 TO 04/26			
STORM TOTAL	0.01				

DEGREE DAYS

HEATING TOTAL	78		106	-28	104
SINCE 7/1	1052		1176	-124	1132
COOLING TOTAL	40		29	11	39
SINCE 1/1	67		47	20	52

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WIND (MPH)

AVERAGE WIND SPEED	5.9			
HIGHEST WIND SPEED/DIRECTION	25/270	DATE	04/18	

	25/280	04/28
HIGHEST GUST SPEED/DIRECTION	33/280	DATE 04/18
	33/290	04/28

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM

AVERAGE SKY COVER 0.37

NUMBER OF DAYS FAIR 17

NUMBER OF DAYS PC 8

NUMBER OF DAYS CLOUDY 5

AVERAGE RH (PERCENT) 63

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
--------------	---	--------------	---

HEAVY RAIN	0	RAIN	0
------------	---	------	---

LIGHT RAIN	2	FREEZING RAIN	0
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LT FREEZING RAIN	0	HAIL	0
------------------	---	------	---

HEAVY SNOW	0	SNOW	0
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LIGHT SNOW	0	SLEET	0
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FOG	7	FOG W/VIS <= 1/4 MILE	0
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HAZE	7		
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- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

[Explanation of the Preliminary Monthly Climate Data \(F6\) Product](#)

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

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CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
 MONTH: MAY
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

TEMPERATURE IN F:						:PCPN:		SNOW:		WIND		:SUNSHINE: SKY				:PK WND		
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
=====																		
12Z AVG MX 2MIN																		
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
=====																		
1	67	58	63	-1	2	0	0.00	M	M	6.2	13	150	M	M	4	1	18	150
2	67	59	63	-1	2	0	0.00	M	M	7.3	15	160	M	M	5		24	150
3	75	59	67	3	0	2	0.00	M	M	6.4	15	290	M	M	3		M	M
4	79	60	70	5	0	5	0.00	M	M	5.8	10	310	M	M	4		M	M
5	78	60	69	4	0	4	0.00	M	M	4.6	13	200	M	M	5	18	18	320
6	70	60	65	0	0	0	0.00	M	M	5.5	15	200	M	M	6		21	180
7	69	60	65	0	0	0	0.00	M	M	5.5	13	280	M	M	8		18	220
8	71	60	66	1	0	1	0.00	M	M	5.8	13	190	M	M	5		17	200
9	68	60	64	-1	1	0	0.00	M	M	5.6	12	290	M	M	7		14	170
10	67	60	64	-1	1	0	T	M	M	6.6	12	210	M	M	8	18	16	190
11	73	61	67	2	0	2	0.00	M	M	6.1	14	280	M	M	7		17	290
12	73	61	67	2	0	2	0.00	M	M	6.2	14	290	M	M	6	8	18	250
13	70	60	65	0	0	0	0.00	M	M	7.1	14	320	M	M	7	8	M	M
14	71	60	66	1	0	1	0.00	M	M	6.8	14	300	M	M	5		20	300
15	69	60	65	-1	0	0	0.00	M	M	6.6	10	200	M	M	9		21	210
16	66	58	62	-4	3	0	0.00	M	M	5.9	9	190	M	M	10		M	M
17	68	59	64	-2	1	0	0.00	M	M	5.3	10	290	M	M	8		M	M
18	71	59	65	-1	0	0	0.00	M	M	4.7	14	190	M	M	5		M	M
19	71	60	66	0	0	1	0.00	M	M	6.2	12	190	M	M	5		17	190
20	70	59	65	-1	0	0	0.00	M	M	7.2	13	200	M	M	6		M	M
21	73	56	65	-1	0	0	T	M	M	8.6	16	270	M	M	2		24	220
22	68	52	60	-6	5	0	0.00	M	M	5.8	14	230	M	M	1		21	220
23	74	54	64	-2	1	0	0.00	M	M	5.3	15	300	M	M	0		20	290
24	87	56	72	6	0	7	0.00	M	M	6.8	21	290	M	M	0		25	290
25	77	59	68	2	0	3	0.00	M	M	5.2	10	170	M	M	0		M	M
26	69	62	66	0	0	1	0.00	M	M	7.6	14	160	M	M	5	8	21	140
27	72	59	66	0	0	1	0.00	M	M	7.9	13	190	M	M	3		18	200
28	73	59	66	0	0	1	0.00	M	M	5.7	13	310	M	M	4		16	310
29	69	59	64	-2	1	0	0.00	M	M	5.9	13	300	M	M	8		15	290
30	68	61	65	-1	0	0	0.00	M	M	5.1	14	180	M	M	8		17	190
31	70	60	65	-1	0	0	0.00	M	M	6.2	14	200	M	M	7		18	200
=====																		
SM	2213	1830			17	31	T	M		191.5			M		161			
=====																		
AV	71.4	59.0								6.2	FASTST		M	M	5		MAX(MPH)	

MISC ----> 21 290

25 290

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NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
MONTH: MAY
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

[TEMPERATURE DATA]

[PRECIPITATION DATA]

SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 65.2
DPTR FM NORMAL: -0.3
HIGHEST: 87 ON 24
LOWEST: 52 ON 22

TOTAL FOR MONTH: T
DPTR FM NORMAL: -0.26
GRTST 24HR T ON 10-10

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: M
GRTST 24HR M ON M
GRTST DEPTH: M ON M

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY
TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM:
VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

[WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0 0.01 INCH OR MORE: 0
MAX 90 OR ABOVE: 0 0.10 INCH OR MORE: 0
MIN 32 OR BELOW: 0 0.50 INCH OR MORE: 0
MIN 0 OR BELOW: 0 1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 17
DPTR FM NORMAL -23
TOTAL FM JUL 1 1069
DPTR FM NORMAL -101

CLEAR (SCALE 0-3) 7
PTCLDY (SCALE 4-7) 21
CLOUDY (SCALE 8-10) 3

[CDD (BASE 65)]

TOTAL THIS MO. 31
DPTR FM NORMAL -24
TOTAL FM JAN 1 98
DPTR FM NORMAL -8

[PRESSURE DATA]

HIGHEST SLP 30.12 ON 23
LOWEST SLP 29.81 ON 2

[REMARKS]

#FINAL-05-21#

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Climatological Report (Monthly)

000
CXUS56 KLOX 011630
CLMLGB

CLIMATE REPORT
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD
930 AM PDT TUE JUN 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF MAY 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020
CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
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TEMPERATURE (F)

HIGHEST	87	05/24			
LOWEST	52	05/22			
AVG. MAXIMUM	71.4		73.1	-1.7	
AVG. MINIMUM	59.0		57.9	1.1	
MEAN	65.2		65.5	-0.3	
DAYS MAX >= 90	0				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	T		0.26	-0.26	
DAILY AVG.	T				
DAYS >= .01	0				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	T	05/21 TO 05/21			
STORM TOTAL	0.00				

DEGREE DAYS

HEATING TOTAL	17	40	-23	2
SINCE 7/1	1069	1170	-101	1134
COOLING TOTAL	30	55	-25	117
SINCE 1/1	98	106	-8	169

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WIND (MPH)

AVERAGE WIND SPEED	6.2			
HIGHEST WIND SPEED/DIRECTION	21/290	DATE	05/24	
HIGHEST GUST SPEED/DIRECTION	25/290	DATE	05/24	

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM
AVERAGE SKY COVER 0.50
NUMBER OF DAYS FAIR 7
NUMBER OF DAYS PC 17
NUMBER OF DAYS CLOUDY 7

AVERAGE RH (PERCENT) 67

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	2	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	3	FOG W/VIS <= 1/4 MILE	0
HAZE	5		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

[Explanation of the Preliminary Monthly Climate Data \(F6\) Product](#)

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

007

CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
 MONTH: JUNE
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

TEMPERATURE IN F:										:PCPN:		SNOW:		WIND		:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18			
										12Z	AVG	MX	2MIN								
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR			
1	76	61	69	2	0	4	0.00	M	M	5.5	10	320	M	M	6	8	M	M			
2	77	59	68	1	0	3	0.00	M	M	5.1	10	170	M	M	6	18	M	M			
3	70	59	65	-2	0	0	0.00	M	M	6.1	12	180	M	M	7	1	M	M			
4	68	60	64	-3	1	0	0.00	M	M	5.5	12	190	M	M	3		16	230			
5	75	60	68	1	0	3	0.00	M	M	6.2	10	290	M	M	4		M	M			
6	68	61	65	-2	0	0	0.00	M	M	6.3	13	170	M	M	6		17	170			
7	67	59	63	-4	2	0	T	M	M	7.0	14	160	M	M	10	18	19	120			
8	73	60	67	0	0	2	0.00	M	M	6.5	15	290	M	M	4		19	300			
9	75	61	68	0	0	3	0.00	M	M	8.5	21	290	M	M	0		26	290			
10	77	57	67	-1	0	2	0.00	M	M	7.1	20	290	M	M	0		23	290			
11	82	57	70	2	0	5	0.00	M	M	5.8	13	300	M	M	0		M	M			
12	85	59	72	4	0	7	0.00	M	M	5.4	10	280	M	M	0		M	M			
13	83	61	72	4	0	7	0.00	M	M	7.0	15	290	M	M	2		M	M			
14	87	62	75	7	0	10	0.00	M	M	6.2	17	290	M	M	0	8	M	M			
15	87	63	75	7	0	10	0.00	M	M	5.2	13	140	M	M	0		16	150			
16	74	64	69	0	0	4	0.00	M	M	6.5	15	160	M	M	2	18	19	150			
17	73	62	68	-1	0	3	0.00	M	M	6.0	13	210	M	M	6	1	19	170			
18	72	63	68	-1	0	3	0.00	M	M	5.8	15	180	M	M	6	1	18	190			
19	78	63	71	2	0	6	0.00	M	M	6.2	13	300	M	M	5	18	19	300			
20	72	62	67	-2	0	2	0.00	M	M	5.6	13	150	M	M	4	18	17	150			
21	79	62	71	1	0	6	0.00	M	M	6.2	17	300	M	M	3		20	310			
22	78	61	70	0	0	5	0.00	M	M	8.0	16	300	M	M	0		21	290			
23	81	62	72	2	0	7	0.00	M	M	7.1	16	290	M	M	0		20	280			
24	76	61	69	-1	0	4	0.00	M	M	6.9	17	300	M	M	2		21	310			
25	80	60	70	0	0	5	0.00	M	M	5.5	15	220	M	M	0		18	220			
26	82	61	72	2	0	7	0.00	M	M	5.3	12	310	M	M	0		17	180			
27	74	62	68	-3	0	3	0.00	M	M	6.7	13	150	M	M	4	1	18	160			
28	74	64	69	-2	0	4	0.00	M	M	6.5	15	180	M	M	6	1	20	180			
29	69	64	67	-4	0	2	0.00	M	M	6.6	14	200	M	M	10		17	190			
30	74	63	69	-2	0	4	0.00	M	M	6.3	14	180	M	M	6		18	170			
=====																					
SM	2286	1833			3	121		T	M	188.5			M		102						
=====																					
AV	76.2	61.1								6.3	FASTST		M	M	3		MAX(MPH)				
								MISC	----		21	290					26	290			

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NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
 MONTH: JUNE
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

[TEMPERATURE DATA]

[PRECIPITATION DATA]

SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 68.6
 DPTR FM NORMAL: -0.1
 HIGHEST: 87 ON 15,14
 LOWEST: 57 ON 11,10

TOTAL FOR MONTH: T
 DPTR FM NORMAL: -0.07
 GRTST 24HR T ON 7- 7
 SNOW, ICE PELLETS, HAIL
 TOTAL MONTH: M
 GRTST 24HR M ON M
 GRTST DEPTH: M ON M

1 = FOG OR MIST
 2 = FOG REDUCING VISIBILITY
 TO 1/4 MILE OR LESS
 3 = THUNDER
 4 = ICE PELLETS
 5 = HAIL
 6 = FREEZING RAIN OR DRIZZLE
 7 = DUSTSTORM OR SANDSTORM:
 VSBY 1/2 MILE OR LESS
 8 = SMOKE OR HAZE
 9 = BLOWING SNOW
 X = TORNADO

[NO. OF DAYS WITH]

[WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0 0.01 INCH OR MORE: 0
 MAX 90 OR ABOVE: 0 0.10 INCH OR MORE: 0
 MIN 32 OR BELOW: 0 0.50 INCH OR MORE: 0
 MIN 0 OR BELOW: 0 1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 3 CLEAR (SCALE 0-3) 15
 DPTR FM NORMAL -3 PTCLDY (SCALE 4-7) 13
 TOTAL FM JUL 1 1072 CLOUDY (SCALE 8-10) 2
 DPTR FM NORMAL -97

[CDD (BASE 65)]

TOTAL THIS MO. 121
 DPTR FM NORMAL 4
 TOTAL FM JAN 1 219
 DPTR FM NORMAL -4

[PRESSURE DATA]

HIGHEST SLP 30.10 ON 10
 LOWEST SLP 29.68 ON 27

[REMARKS]

#FINAL-06-21#

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

Climatological Report (Monthly)

000
CXUS56 KLOX 011630
CLMLGB

CLIMATE REPORT
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD
930 AM PDT THU JUL 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF JUNE 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020
CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
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.....

TEMPERATURE (F)

HIGHEST	87	06/14 06/15			
LOWEST	57	06/10 06/11			
AVG. MAXIMUM	76.2		76.1	0.1	
AVG. MINIMUM	61.1		61.3	-0.2	
MEAN	68.7		68.7	0.0	
DAYS MAX >= 90	0				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	T		0.07	-0.07	
DAILY AVG.	T				
DAYS >= .01	0				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	T	06/07 TO 06/07			
STORM TOTAL	0.00				

DEGREE DAYS

HEATING TOTAL	3		6	-3	0
SINCE 7/1	1072		1169	-97	1134
COOLING TOTAL	121		117	4	155
SINCE 1/1	219		223	-4	324

.....

WIND (MPH)

AVERAGE WIND SPEED		6.3			
HIGHEST WIND SPEED/DIRECTION		21/290	DATE	06/09	
HIGHEST GUST SPEED/DIRECTION		26/290	DATE	06/09	

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM
AVERAGE SKY COVER 0.34
NUMBER OF DAYS FAIR 16
NUMBER OF DAYS PC 12
NUMBER OF DAYS CLOUDY 2

AVERAGE RH (PERCENT) 69

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	0	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	10	FOG W/VIS <= 1/4 MILE	0
HAZE	7		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

Climatological Report (Monthly)

000
CXUS56 KLOX 011630
CLMLGB

CLIMATE REPORT
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD
930 AM PDT SUN AUG 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF JULY 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020
CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

.....

TEMPERATURE (F)

HIGHEST	89	07/19 07/20			
LOWEST	61	07/05			
AVG. MAXIMUM	81.7		81.4	0.3	
AVG. MINIMUM	65.7		64.9	0.8	
MEAN	73.7		73.1	0.6	
DAYS MAX >= 90	0				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	0.03		0.05	-0.02	
DAILY AVG.	0.00				
DAYS >= .01	1				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	0.03	07/26 TO 07/26			
STORM TOTAL	0.03				

DEGREE DAYS

HEATING TOTAL	0	0	0	0
SINCE 7/1	0	0	0	0
COOLING TOTAL	275	253	22	242
SINCE 1/1	494	476	18	566

.....

WIND (MPH)

AVERAGE WIND SPEED	5.9			
HIGHEST WIND SPEED/DIRECTION	17/290	DATE	07/01	
	17/290		07/18	
HIGHEST GUST SPEED/DIRECTION	20/190	DATE	07/10	

20/290	07/18
20/310	07/19
20/290	07/30

SKY COVER

POSSIBLE SUNSHINE (PERCENT)	MM
AVERAGE SKY COVER	0.19
NUMBER OF DAYS FAIR	24
NUMBER OF DAYS PC	7
NUMBER OF DAYS CLOUDY	0

AVERAGE RH (PERCENT)	67
----------------------	----

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	1	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	12	FOG W/VIS <= 1/4 MILE	0
HAZE	16		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

[Explanation of the Preliminary Monthly Climate Data \(F6\) Product](#)

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - <http://www.ncdc.noaa.gov>.

WFO Monthly/Daily Climate Data

150

CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
 MONTH: JULY
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

TEMPERATURE IN F:					:PCPN:			SNOW:		WIND		:SUNSHINE:				SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18	
=====																			
12Z AVG MX 2MIN																			
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR	
=====																			
1	84	63	74	3	0	9	0.00	M	M	6.0	17	290	M	M	4		19	290	
2	82	64	73	1	0	8	0.00	M	M	4.7	13	310	M	M	2	18	16	180	
3	84	64	74	2	0	9	0.00	M	M	6.6	16	310	M	M	2	18	19	310	
4	80	62	71	-1	0	6	0.00	M	M	6.5	15	290	M	M	4	8	19	290	
5	80	61	71	-1	0	6	0.00	M	M	6.2	14	300	M	M	3	18	17	320	
6	80	62	71	-1	0	6	0.00	M	M	5.2	13	290	M	M	4	8	15	300	
7	73	64	69	-3	0	4	0.00	M	M	5.8	14	170	M	M	3		17	180	
8	78	65	72	0	0	7	0.00	M	M	4.5	13	160	M	M	1		17	160	
9	87	67	77	4	0	12	0.00	M	M	5.3	13	290	M	M	0		15	150	
10	83	67	75	2	0	10	0.00	M	M	5.3	15	180	M	M	0		20	190	
11	77	66	72	-1	0	7	0.00	M	M	5.8	13	190	M	M	1		18	180	
12	74	66	70	-3	0	5	0.00	M	M	5.3	13	190	M	M	3		18	220	
13	82	67	75	2	0	10	0.00	M	M	6.2	14	160	M	M	1	18	19	170	
14	77	68	73	0	0	8	0.00	M	M	5.3	12	190	M	M	2		18	180	
15	83	67	75	2	0	10	0.00	M	M	6.4	14	290	M	M	2	8	18	280	
16	85	67	76	3	0	11	0.00	M	M	5.7	13	300	M	M	2		17	320	
17	86	67	77	3	0	12	0.00	M	M	5.3	13	320	M	M	1		19	290	
18	87	68	78	4	0	13	0.00	M	M	6.8	17	290	M	M	0		20	290	
19	89	69	79	5	0	14	0.00	M	M	5.8	16	300	M	M	0	8	20	310	
20	89	67	78	4	0	13	0.00	M	M	5.5	15	290	M	M	0	18	18	280	
21	87	67	77	3	0	12	0.00	M	M	6.0	13	280	M	M	0	18	17	290	
22	78	68	73	-1	0	8	0.00	M	M	6.8	13	200	M	M	4	18	18	200	
23	81	67	74	0	0	9	0.00	M	M	5.1	12	300	M	M	5	18	15	190	
24	79	67	73	-1	0	8	0.00	M	M	4.3	13	180	M	M	2		15	180	
25	77	67	72	-2	0	7	0.00	M	M	5.8	14	180	M	M	2		18	190	
26	77	67	72	-2	0	7	0.03	M	M	5.7	13	200	M	M	6		15	190	
27	81	66	74	0	0	9	0.00	M	M	8.6	15	290	M	M	5	8	19	290	
28	85	65	75	1	0	10	0.00	M	M	7.1	15	290	M	M	0	1	19	290	
29	83	64	74	0	0	9	0.00	M	M	6.1	16	300	M	M	0	18	19	300	
30	84	64	74	0	0	9	0.00	M	M	5.8	16	300	M	M	0	18	20	290	
31	80	64	72	-2	0	7	0.00	M	M	7.2	16	310	M	M	0	18	19	310	
=====																			
SM	2532	2037			0	275	0.03	M		182.7			M		59				
=====																			
AV	81.7	65.7								5.9	FASTST		M	M	2		MAX(MPH)		

MISC ----> # 17 290

20 190

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NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
MONTH: JULY
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

[TEMPERATURE DATA]

[PRECIPITATION DATA]

SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 73.7
DPTR FM NORMAL: 0.6
HIGHEST: 89 ON 20,19
LOWEST: 61 ON 5

TOTAL FOR MONTH: 0.03
DPTR FM NORMAL: -0.02
GRTST 24HR 0.03 ON 26-26

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: M
GRTST 24HR M ON M
GRTST DEPTH: M ON M

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY
TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM:
VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

[WEATHER - DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

0.01 INCH OR MORE: 1
0.10 INCH OR MORE: 0
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

[HDD (BASE 65)]

TOTAL THIS MO. 0
DPTR FM NORMAL 0
TOTAL FM JUL 1 0
DPTR FM NORMAL 0

CLEAR (SCALE 0-3) 24
PTCLDY (SCALE 4-7) 7
CLOUDY (SCALE 8-10) 0

[CDD (BASE 65)]

TOTAL THIS MO. 275
DPTR FM NORMAL 22
TOTAL FM JAN 1 494
DPTR FM NORMAL 18

[PRESSURE DATA]
HIGHEST SLP 30.05 ON 23
LOWEST SLP 29.77 ON 7

[REMARKS]

#FINAL-07-21#

Climatological Report (Monthly)

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 CXUS56 KLOX 011630
 CLMLGB

CLIMATE REPORT
 NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD
 930 AM PDT WED SEP 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF AUGUST 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020
 CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

.....

TEMPERATURE (F)

HIGHEST	94	08/26			
LOWEST	62	08/28 08/29			
AVG. MAXIMUM	83.2		83.2	0.0	
AVG. MINIMUM	65.4		65.5	-0.1	
MEAN	74.3		74.3	0.0	
DAYS MAX >= 90	4				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	0.04		0.01	0.03	
DAILY AVG.	0.00				
DAYS >= .01	1				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	0.04	08/21 TO 08/21			
STORM TOTAL	0.04				

DEGREE DAYS

HEATING TOTAL	0	0	0	0
SINCE 7/1	0	0	0	0
COOLING TOTAL	296	290	6	347
SINCE 1/1	790	766	24	913

.....

WIND (MPH)

AVERAGE WIND SPEED	5.7			
HIGHEST WIND SPEED/DIRECTION	18/290	DATE	08/01	
	18/290		08/14	
HIGHEST GUST SPEED/DIRECTION	23/290	DATE	08/01	

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM
AVERAGE SKY COVER 0.24
NUMBER OF DAYS FAIR 22
NUMBER OF DAYS PC 8
NUMBER OF DAYS CLOUDY 1

AVERAGE RH (PERCENT) 66

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	3	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	16	FOG W/VIS <= 1/4 MILE	1
HAZE	16		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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National Weather Service
Los Angeles, CA Weather Forecast Office
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Oxnard, CA 93030
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WFO Monthly/Daily Climate Data

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CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA

MONTH: AUGUST

YEAR: 2021

LATITUDE: 33 49 N

LONGITUDE: 118 9 W

TEMPERATURE IN F:										:PCPN:		SNOW:		WIND		:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18			
										12Z		AVG MX		2MIN							
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR			
1	89	63	76	2	0	11	0.00	M	M	6.3	18	290	M	M	0		23	290			
2	92	64	78	4	0	13	0.00	M	M	5.4	17	290	M	M	0 8		21	290			
3	89	64	77	3	0	12	0.00	M	M	5.2	14	300	M	M	0 8		18	290			
4	85	65	75	1	0	10	0.00	M	M	5.9	15	310	M	M	0		18	310			
5	85	65	75	1	0	10	0.00	M	M	5.8	13	200	M	M	0 18		16	190			
6	73	66	70	-4	0	5	0.00	M	M	6.2	12	170	M	M	7 1		21	200			
7	76	64	70	-4	0	5	0.00	M	M	5.4	12	170	M	M	6 1		15	190			
8	83	65	74	0	0	9	0.00	M	M	4.7	12	290	M	M	5		15	170			
9	85	66	76	2	0	11	0.00	M	M	5.1	14	290	M	M	1		18	290			
10	86	63	75	1	0	10	0.00	M	M	6.4	13	290	M	M	1 18		16	300			
11	91	68	80	6	0	15	T	M	M	5.8	14	290	M	M	0		17	290			
12	91	68	80	6	0	15	0.00	M	M	4.3	12	310	M	M	0 18		14	210			
13	83	66	75	1	0	10	0.00	M	M	5.5	13	290	M	M	1 18		16	210			
14	87	68	78	4	0	13	0.00	M	M	5.9	18	290	M	M	0 8		21	290			
15	88	67	78	4	0	13	0.00	M	M	4.5	12	190	M	M	0		15	200			
16	80	68	74	0	0	9	0.00	M	M	5.1	13	220	M	M	1 18		17	210			
17	77	68	73	-1	0	8	0.00	M	M	5.9	14	200	M	M	6		18	210			
18	77	69	73	-1	0	8	T	M	M	6.3	10	210	M	M	10 1		15	180			
19	80	67	74	0	0	9	0.00	M	M	6.5	14	220	M	M	2		19	230			
20	78	68	73	-1	0	8	0.00	M	M	6.8	14	290	M	M	5		18	190			
21	75	65	70	-4	0	5	0.04	M	M	6.2	12	300	M	M	7 18		16	160			
22	77	66	72	-2	0	7	0.00	M	M	5.9	17	310	M	M	6		20	310			
23	77	63	70	-4	0	5	0.00	M	M	5.2	14	310	M	M	3 18		18	190			
24	81	63	72	-2	0	7	0.00	M	M	6.1	16	290	M	M	0		21	290			
25	87	64	76	2	0	11	0.00	M	M	6.4	14	300	M	M	0 1		19	290			
26	94	66	80	6	0	15	0.00	M	M	4.7	17	310	M	M	0 18		21	290			
27	89	64	77	3	0	12	0.00	M	M	6.0	15	300	M	M	0 18		18	300			
28	87	62	75	1	0	10	0.00	M	M	4.7	12	150	M	M	3 128		16	150			
29	84	62	73	-1	0	8	0.00	M	M	7.7	16	300	M	M	3 18		19	300			
30	79	65	72	-2	0	7	0.00	M	M	5.4	12	170	M	M	1 18		16	170			
31	74	65	70	-4	0	5	0.00	M	M	4.6	10	220	M	M	6 8		14	200			
SM	2579	2027			0	296	0.04	M		175.9			M		74						

AV 83.2 65.4

 5.7 FASTST M M 2 MAX(MPH)
 MISC ----> # 18 290 23 290

NOTES:

LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
 MONTH: AUGUST
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

[TEMPERATURE DATA]	[PRECIPITATION DATA]	SYMBOLS USED IN COLUMN 16
AVERAGE MONTHLY: 74.3	TOTAL FOR MONTH: 0.04	1 = FOG OR MIST
DPTR FM NORMAL: 0.0	DPTR FM NORMAL: 0.03	2 = FOG REDUCING VISIBILITY
HIGHEST: 94 ON 26	GRTST 24HR 0.04 ON 21-21	TO 1/4 MILE OR LESS
LOWEST: 62 ON 29,28		3 = THUNDER
	SNOW, ICE PELLETS, HAIL	4 = ICE PELLETS
	TOTAL MONTH: M	5 = HAIL
	GRTST 24HR M ON M	6 = FREEZING RAIN OR DRIZZLE
	GRTST DEPTH: M ON M	7 = DUSTSTORM OR SANDSTORM:
		VSBY 1/2 MILE OR LESS
		8 = SMOKE OR HAZE
		9 = BLOWING SNOW
		X = TORNADO
[NO. OF DAYS WITH]	[WEATHER - DAYS WITH]	
MAX 32 OR BELOW: 0	0.01 INCH OR MORE: 1	
MAX 90 OR ABOVE: 4	0.10 INCH OR MORE: 0	
MIN 32 OR BELOW: 0	0.50 INCH OR MORE: 0	
MIN 0 OR BELOW: 0	1.00 INCH OR MORE: 0	
[HDD (BASE 65)]		
TOTAL THIS MO. 0	CLEAR (SCALE 0-3) 22	
DPTR FM NORMAL 0	PTCLDY (SCALE 4-7) 8	
TOTAL FM JUL 1 0	CLOUDY (SCALE 8-10) 1	
DPTR FM NORMAL 0		
[CDD (BASE 65)]		
TOTAL THIS MO. 296		
DPTR FM NORMAL 6	[PRESSURE DATA]	
TOTAL FM JAN 1 790	HIGHEST SLP 30.09 ON 14	
DPTR FM NORMAL 24	LOWEST SLP 29.66 ON 27	

[REMARKS]
 #FINAL-08-21#

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 Los Angeles, CA Weather Forecast Office
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CXUS56 KLOX 011155

CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA

MONTH: SEPTEMBER

YEAR: 2021

LATITUDE: 33 49 N

LONGITUDE: 118 9 W

TEMPERATURE IN F:						:PCPN:	SNOW:	WIND		:SUNSHINE:		SKY		:PK WND				
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
12Z AVG MX 2MIN																		
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	75	66	71	-3	0	6	0.00	M	M	5.0	12	190	M	M	7	8	18	190
2	77	65	71	-3	0	6	0.00	M	M	6.2	15	300	M	M	6		19	290
3	81	64	73	-1	0	8	0.00	M	M	6.3	16	280	M	M	4	8	20	300
4	92	62	77	3	0	12	0.00	M	M	4.6	17	300	M	M	0	18	21	300
5	97	64	81	7	0	16	0.00	M	M	6.7	16	300	M	M	0	18	19	300
6	78	68	73	-1	0	8	0.00	M	M	6.4	15	150	M	M	5	8	19	150
7	79	68	74	0	0	9	0.00	M	M	5.3	13	300	M	M	1	18	16	210
8	85	66	76	2	0	11	0.00	M	M	6.4	14	320	M	M	2	18	16	310
9	91	65	78	4	0	13	0.00	M	M	5.4	13	310	M	M	1	138	14	190
10	88	65	77	3	0	12	T	M	M	6.5	14	310	M	M	1	18	17	300
11	92	68	80	6	0	15	0.00	M	M	6.0	18	300	M	M	0		22	300
12	89	61	75	1	0	10	0.00	M	M	5.9	16	300	M	M	0	18	20	290
13	85	59	72	-2	0	7	0.00	M	M	5.6	12	310	M	M	3	18	14	290
14	76	60	68	-6	0	3	0.00	M	M	4.7	10	310	M	M	2	1	15	210
15	79	61	70	-3	0	5	0.00	M	M	5.8	14	290	M	M	4	8	16	170
16	76	61	69	-4	0	4	0.00	M	M	6.0	15	300	M	M	4		18	290
17	74	61	68	-5	0	3	0.00	M	M	5.5	13	290	M	M	3		15	170
18	77	61	69	-4	0	4	0.00	M	M	5.9	16	290	M	M	3		20	300
19	73	58	66	-7	0	1	0.00	M	M	3.7	12	190	M	M	1	18	14	180
20	77	60	69	-4	0	4	0.00	M	M	4.0	10	180	M	M	0	18	13	200
21	98	64	81	8	0	16	0.00	M	M	4.6	17	290	M	M	0		21	290
22	89	68	79	7	0	14	0.00	M	M	6.9	23	300	M	M	0		27	290
23	82	63	73	1	0	8	0.00	M	M	5.6	14	310	M	M	0	8	17	290
24	79	61	70	-2	0	5	0.00	M	M	5.0	15	320	M	M	2	18	21	310
25	78	62	70	-2	0	5	0.00	M	M	6.4	14	280	M	M	1	1	17	290
26	70	62	66	-6	0	1	0.00	M	M	5.4	13	290	M	M	10		15	240
27	70	62	66	-6	0	1	0.00	M	M	4.5	9	180	M	M	10		13	200
28	72	63	68	-3	0	3	0.00	M	M	4.2	12	300	M	M	8		15	180
29	76	60	68	-3	0	3	0.00	M	M	3.4	14	290	M	M	1	18	17	320
30	94	58	76	5	0	11	0.00	M	M	4.3	20	290	M	M	0	18	23	290
SM	2449	1886			0	224	T	M		162.2			M		79			
AV	81.6	62.9								5.4	FASTST	M	M	3		MAX(MPH)		
							MISC	----		23	300					27	290	

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
 MONTH: SEPTEMBER
 YEAR: 2021
 LATITUDE: 33 49 N
 LONGITUDE: 118 9 W

[TEMPERATURE DATA]	[PRECIPITATION DATA]	SYMBOLS USED IN COLUMN 16
AVERAGE MONTHLY: 72.3	TOTAL FOR MONTH: T	1 = FOG OR MIST
DPTR FM NORMAL: -0.8	DPTR FM NORMAL: -0.08	2 = FOG REDUCING VISIBILITY
HIGHEST: 98 ON 21	GRTST 24HR T ON 10-10	TO 1/4 MILE OR LESS
LOWEST: 58 ON 30,19		3 = THUNDER
	SNOW, ICE PELLETS, HAIL	4 = ICE PELLETS
	TOTAL MONTH: M	5 = HAIL
	GRTST 24HR M ON M	6 = FREEZING RAIN OR DRIZZLE
	GRTST DEPTH: M ON M	7 = DUSTSTORM OR SANDSTORM:
		VSBY 1/2 MILE OR LESS
		8 = SMOKE OR HAZE
		9 = BLOWING SNOW
		X = TORNADO
[NO. OF DAYS WITH]	[WEATHER - DAYS WITH]	
MAX 32 OR BELOW: 0	0.01 INCH OR MORE: 0	
MAX 90 OR ABOVE: 6	0.10 INCH OR MORE: 0	
MIN 32 OR BELOW: 0	0.50 INCH OR MORE: 0	
MIN 0 OR BELOW: 0	1.00 INCH OR MORE: 0	
[HDD (BASE 65)]		
TOTAL THIS MO. 0	CLEAR (SCALE 0-3) 19	
DPTR FM NORMAL -1	PTCLDY (SCALE 4-7) 9	
TOTAL FM JUL 1 0	CLOUDY (SCALE 8-10) 2	
DPTR FM NORMAL 0		
[CDD (BASE 65)]		
TOTAL THIS MO. 224		
DPTR FM NORMAL -21	[PRESSURE DATA]	
TOTAL FM JAN 1 1014	HIGHEST SLP 30.08 ON 18	
DPTR FM NORMAL 3	LOWEST SLP 29.78 ON 8	

[REMARKS]
 #FINAL-09-21#

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Climatological Report (Monthly)

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 CXUS56 KLOX 011630
 CLMLGB

CLIMATE REPORT
 NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD
 930 AM PDT FRI OCT 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF SEPTEMBER 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020
 CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

.....

TEMPERATURE (F)

HIGHEST	98	09/21			
LOWEST	58	09/19 09/30			
AVG. MAXIMUM	81.6		82.4	-0.8	
AVG. MINIMUM	62.9		63.9	-1.0	
MEAN	72.3		73.1	-0.8	
DAYS MAX >= 90	6				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				

PRECIPITATION (INCHES)

TOTALS	T		0.08	-0.08	
DAILY AVG.	T				
DAYS >= .01	0				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	T	09/10 TO 09/10			
STORM TOTAL	0.00				

DEGREE DAYS

HEATING TOTAL	0	1	-1	0
SINCE 7/1	0	0	0	0
COOLING TOTAL	224	245	-21	315
SINCE 1/1	1014	1011	3	1228

.....

WIND (MPH)

AVERAGE WIND SPEED	5.4			
HIGHEST WIND SPEED/DIRECTION	23/300	DATE	09/22	
HIGHEST GUST SPEED/DIRECTION	27/290	DATE	09/22	

SKY COVER

POSSIBLE SUNSHINE (PERCENT) MM

AVERAGE SKY COVER	0.26
NUMBER OF DAYS FAIR	21
NUMBER OF DAYS PC	6
NUMBER OF DAYS CLOUDY	3

AVERAGE RH (PERCENT) 66

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	1	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	0	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	15	FOG W/VIS <= 1/4 MILE	0
HAZE	18		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

\$\$

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Los Angeles, CA Weather Forecast Office
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Los Angeles, CA

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CF6LGB
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
MONTH: OCTOBER
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND

=====

1 2 3 4 5 6A 6B 7 8 9 10 11 12 13 14 15 16 17 18

12Z AVG MX 2MIN

DY MAX MIN AVG DEP HDD CDD WTR SNW DPTH SPD SPD DIR MIN PSBL S-S WX SPD DR

=====

1 86 58 72 1 0 7 0.00 M M 4.3 12 290 M M 0 13 170

2 94 59 77 6 0 12 0.00 M M 5.0 17 290 M M 0 1 21 280

3 94 60 77 6 0 12 0.00 M M 3.4 17 290 M M 0 21 300

4 89 65 77 7 0 12 0.09 M M 5.2 29 120 M M 2 3 40 110

5 77 65 71 1 0 6 0.01 M M 6.8 17 50 M M 2 23 50

6 76 63 70 0 0 5 0.00 M M 3.7 15 300 M M 4 18 17 300

7 71 63 67 -3 0 2 0.00 M M 3.8 10 200 M M 9 18 13 210

8 69 59 64 -6 1 0 0.02 M M 5.0 12 290 M M 6 1 14 190

9 74 55 65 -5 0 0 0.00 M M 3.5 14 300 M M 0 8 20 290

10 80 54 67 -2 0 2 0.00 M M 3.0 13 310 M M 0 15 290

11 71 56 64 -5 1 0 0.00 M M 10.4 33 350 M M 6 18 41 350

12 73 54 64 -5 1 0 0.00 M M 9.2 24 340 M M 1 8 30 340

13 77 50 64 -5 1 0 0.00 M M 3.6 17 290 M M 0 21 300

14 77 52 65 -4 0 0 0.00 M M 2.9 14 300 M M 0 17 310

15 91 55 73 4 0 8 0.00 M M 5.3 18 280 M M 0 8 24 80

16 88 59 74 6 0 9 0.00 M M 4.5 10 290 M M 0 13 200

17 76 54 65 -3 0 0 0.00 M M 4.5 20 290 M M 1 22 290

18 67 55 61 -7 4 0 T M M 6.3 15 200 M M 5 19 190

19 67 51 59 -9 6 0 0.00 M M 3.2 10 200 M M 0 14 200

20 74 53 64 -4 1 0 0.00 M M 4.9 17 280 M M 0 20 290

21 78 51 65 -3 0 0 0.00 M M 4.0 16 290 M M 1 1 19 290

22 69 58 64 -3 1 0 0.00 M M 4.5 14 290 M M 7 18 19 290

23 66 59 63 -4 2 0 0.14 M M 5.3 12 210 M M 7 1 15 170

24 71 57 64 -3 1 0 0.00 M M 4.1 13 300 M M 3 1 16 200

25 62 53 58 -9 7 0 0.13 M M 7.3 22 270 M M 7 18 29 280

26 70 50 60 -7 5 0 0.00 M M 4.2 15 290 M M 0 1 18 290

27 83 52 68 1 0 3 0.00 M M 2.9 12 290 M M 0 13 290

28 92 56 74 8 0 9 0.00 M M 4.6 17 290 M M 0 20 290

29 81 58 70 4 0 5 0.00 M M 3.3 10 180 M M 1 12 13 200

30 66 59 63 -3 2 0 0.00 M M 4.8 9 200 M M 7 1 14 210

31 67 58 63 -3 2 0 0.00 M M 3.3 10 200 M M 6 8 14 230

=====

SM 2376 1751 35 92 0.39 M 146.8 M 75

=====

AV 76.6 56.5 4.7 FASTST M M 2 MAX(MPH)

MISC ----> 33 350 41 350

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NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
MONTH: OCTOBER
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

[TEMPERATURE DATA] [PRECIPITATION DATA] SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 66.6 TOTAL FOR MONTH: 0.39 1 = FOG OR MIST
DPTR FM NORMAL: -1.8 DPTR FM NORMAL: -0.14 2 = FOG REDUCING VISIBILITY
HIGHEST: 94 ON 3, 2 GRST 24HR 0.14 ON 23-23 TO 1/4 MILE OR LESS
LOWEST: 50 ON 26,13 3 = THUNDER
SNOW, ICE PELLETS, HAIL 4 = ICE PELLETS
TOTAL MONTH: M 5 = HAIL

https://forecast.weather.gov/product.php?site=LOX&issuedby=LGB&product=CF6&format=CI&version=4&glossary=0

1/2

GRSTST 24HR

M

ON

M

GRSTST DEPTH:

M

ON

M

6 = FREEZING RAIN OR DRIZZLE

7 = DUSTSTORM OR SANDSTORM:
VSBY 1/2 MILE OR LESS

8 = SMOKE OR HAZE

9 = BLOWING SNOW

X = TORNADO

[NO. OF DAYS WITH]

[WEATHER - DAYS WITH]

MAX 32 OR BELOW:

0

0.01 INCH OR MORE:

5

MAX 90 OR ABOVE:

4

0.10 INCH OR MORE:

2

MIN 32 OR BELOW:

0

0.50 INCH OR MORE:

0

MIN 0 OR BELOW:

0

1.00 INCH OR MORE:

0

[HDD (BASE 65)]

TOTAL THIS MO.

35

CLEAR (SCALE 0-3)

21

DPTR FM NORMAL

16

PTCLDY (SCALE 4-7)

9

TOTAL FM JUL 1

35

CLOUDY (SCALE 8-10)

1

DPTR FM NORMAL

18

[CDD (BASE 65)]

TOTAL THIS MO.

92

DPTR FM NORMAL

-32

[PRESSURE DATA]

TOTAL FM JAN 1

1106

HIGHEST SLP 30.18 ON 27

DPTR FM NORMAL

-29

LOWEST SLP 29.61 ON 11

[REMARKS]

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CLMLGB

CLIMATE REPORT

NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD

930 AM PDT MON NOV 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF OCTOBER 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020

CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
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TEMPERATURE (F)					
HIGHEST	94	10/02			
		10/03			
LOWEST	50	10/13			
		10/26			
AVG. MAXIMUM	76.6		77.7	-1.1	
AVG. MINIMUM	56.5		59.1	-2.6	
MEAN	66.6		68.4	-1.8	
DAYS MAX >= 90	4				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				
PRECIPITATION (INCHES)					
TOTALS	0.39		0.53	-0.14	
DAILY AVG.	0.01				
DAYS >= .01	5				
DAYS >= .10	2				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	0.14	10/23 TO 10/23			
STORM TOTAL	0.14				
DEGREE DAYS					
HEATING TOTAL	35		19	16	4
SINCE 7/1	35		17	18	4
COOLING TOTAL	92		124	-32	218
SINCE 1/1	1106		1135	-29	1446

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WIND (MPH)			
AVERAGE WIND SPEED	4.7		
HIGHEST WIND SPEED/DIRECTION	33/350	DATE	10/11
HIGHEST GUST SPEED/DIRECTION	41/350	DATE	10/11
SKY COVER			
POSSIBLE SUNSHINE (PERCENT)	MM		
AVERAGE SKY COVER	0.24		
NUMBER OF DAYS FAIR	21		
NUMBER OF DAYS PC	9		
NUMBER OF DAYS CLOUDY	1		
AVERAGE RH (PERCENT)			
	61		
WEATHER CONDITIONS. NUMBER OF DAYS WITH			
THUNDERSTORM	1	MIXED PRECIP	0
HEAVY RAIN	1	RAIN	1
LIGHT RAIN	6	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	13	FOG W/VIS <= 1/4 MILE	1
HAZE	9		

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

\$\$

National Weather Service
Los Angeles, CA Weather Forecast Office
520 North Elevar Street
Oxnard, CA 93030
805-988-6610

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CXUS56 KLOX 020031 RRA
CF6LGB

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
MONTH: NOVEMBER
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

TEMPERATURE IN F:							:PCPN:		SNOW:		WIND		:SUNSHINE: SKY				:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
12Z AVG MX 2MIN																		
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	68	55	62	-4	3	0	0.00	M	M	3.4	15	300	M	M	1	18	18	310
2	68	55	62	-3	3	0	0.00	M	M	3.7	10	300	M	M	5	18	14	200
3	74	56	65	0	0	0	0.00	M	M	3.4	14	300	M	M	6	18	16	300
4	69	56	63	-2	2	0	0.00	M	M	3.6	9	130	M	M	6	128	12	180
5	66	56	61	-4	4	0	0.00	M	M	4.2	12	180	M	M	8	128	14	180
6	65	55	60	-4	5	0	0.00	M	M	4.4	12	310	M	M	6	18	14	280
7	67	56	62	-2	3	0	0.00	M	M	3.4	12	310	M	M	6	18	13	290
8	66	57	62	-2	3	0	0.00	M	M	4.0	12	230	M	M	5	18	14	230
9	69	55	62	-2	3	0	0.00	M	M	4.3	18	280	M	M	6	18	21	290
10	71	58	65	1	0	0	0.00	M	M	4.2	12	300	M	M	3	18	13	210
11	90	56	73	10	0	8	0.00	M	M	3.5	10	320	M	M	0	8	14	300
12	95	58	77	14	0	12	0.00	M	M	3.7	12	290	M	M	0		13	300
13	88	58	73	10	0	8	0.00	M	M	1.7	10	210	M	M	0		14	200
14	90	55	73	11	0	8	0.00	M	M	3.3	13	300	M	M	0		15	300
15	81	54	68	6	0	3	0.00	M	M	4.0	14	300	M	M	0	18	15	290
16	63	56	60	-2	5	0	0.00	M	M	4.6	10	120	M	M	8	18	14	110
17	67	55	61	-1	4	0	0.00	M	M	2.5	13	310	M	M	4	18	14	300
18	66	51	59	-2	6	0	0.00	M	M	3.1	13	290	M	M	4	18	16	280
19	66	55	61	0	4	0	0.00	M	M	3.4	9	300	M	M	6	18	12	210
20	67	56	62	1	3	0	0.00	M	M	3.5	14	290	M	M	5	18	16	300
21	86	52	69	8	0	4	0.00	M	M	6.8	20	100	M	M	0	18	25	80
22	86	56	71	11	0	6	0.00	M	M	5.3	12	310	M	M	0		15	310
23	72	55	64	4	1	0	0.00	M	M	3.0	10	180	M	M	0		14	160
24	73	51	62	2	3	0	0.00	M	M	3.2	16	70	M	M	0		22	60
25	80	52	66	6	0	1	0.00	M	M	9.0	23	100	M	M	0		29	100
26	80	48	64	5	1	0	0.00	M	M	5.0	15	290	M	M	0		19	290
27	76	47	62	3	3	0	0.00	M	M	2.2	9	170	M	M	0		11	190
28	79	50	65	6	0	0	0.00	M	M	2.9	13	310	M	M	1	18	14	300
29	75	47	61	2	4	0	0.00	M	M	1.8	7	290	M	M	0	128	9	190
30	69	51	60	2	5	0	0.00	M	M	1.7	10	150	M	M	5	128	12	150
=====																		
SM	2232	1622			65	50	0.00	M		112.8			M		85			
=====																		
AV	74.4	54.1								3.8	FASTST		M	M	3		MAX(MPH)	
MISC ---->										23	100						29	100
=====																		

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
MONTH: NOVEMBER
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

[TEMPERATURE DATA]	[PRECIPITATION DATA]	SYMBOLS USED IN COLUMN 16
AVERAGE MONTHLY: 64.2	TOTAL FOR MONTH: 0.00	1 = FOG OR MIST
DPTR FM NORMAL: 2.2	DPTR FM NORMAL: -0.75	2 = FOG REDUCING VISIBILITY
HIGHEST: 95 ON 12	GRST 24HR 0.00 ON 1- 1	TO 1/4 MILE OR LESS
LOWEST: 47 ON 29,27		3 = THUNDER
	SNOW, ICE PELLETS, HAIL	4 = ICE PELLETS
	TOTAL MONTH: M	5 = HAIL

[NO. OF DAYS WITH]	[WEATHER - DAYS WITH]
MAX 32 OR BELOW: 0	0.01 INCH OR MORE: 0
MAX 90 OR ABOVE: 3	0.10 INCH OR MORE: 0
MIN 32 OR BELOW: 0	0.50 INCH OR MORE: 0
MIN 0 OR BELOW: 0	1.00 INCH OR MORE: 0
[HDD (BASE 65)]	
TOTAL THIS MO. 65	CLEAR (SCALE 0-3) 16
DPTR FM NORMAL -53	PTCLDY (SCALE 4-7) 14
TOTAL FM JUL 1 100	CLOUDY (SCALE 8-10) 0
DPTR FM NORMAL -39	
[CDD (BASE 65)]	
TOTAL THIS MO. 50	
DPTR FM NORMAL 21	[PRESSURE DATA]
TOTAL FM JAN 1 1156	HIGHEST SLP 30.27 ON 25
DPTR FM NORMAL -8	LOWEST SLP 29.90 ON 23
[REMARKS]	
#FINAL-11-21#	

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CXUS56 KLOX 011730

CLMLGB

CLIMATE REPORT

NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD

930 AM PST WED DEC 01 2021

.....

...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF NOVEMBER 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020

CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

.....

TEMPERATURE (F)					
HIGHEST	95	11/12			
LOWEST	47	11/27			
		11/29			
AVG. MAXIMUM	74.4		72.5	1.9	
AVG. MINIMUM	54.1		51.6	2.5	
MEAN	64.3		62.0	2.3	
DAYS MAX >= 90	3				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				
PRECIPITATION (INCHES)					
TOTALS	0.00		0.75	-0.75	
DAILY AVG.	0.00				
DAYS >= .01	0				
DAYS >= .10	0				
DAYS >= .50	0				
DAYS >= 1.00	0				
GREATEST					
24 HR. TOTAL	0.00	10/31 TO 10/31			
STORM TOTAL	0.00				
DEGREE DAYS					
HEATING TOTAL	65		118	-53	126
SINCE 7/1	100		139	-39	MM
COOLING TOTAL	50		29	21	41
SINCE 1/1	1156		1164	-8	MM

.....

WIND (MPH)			
AVERAGE WIND SPEED	3.8		
HIGHEST WIND SPEED/DIRECTION	23/100	DATE	11/25
HIGHEST GUST SPEED/DIRECTION	29/100	DATE	11/25

SKY COVER	
POSSIBLE SUNSHINE (PERCENT)	MM
AVERAGE SKY COVER	0.28
NUMBER OF DAYS FAIR	16
NUMBER OF DAYS PC	12
NUMBER OF DAYS CLOUDY	2

AVERAGE RH (PERCENT)	62
----------------------	----

WEATHER CONDITIONS. NUMBER OF DAYS WITH			
THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	0	RAIN	0
LIGHT RAIN	0	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	20	FOG W/VIS <= 1/4 MILE	4
HAZE	21		

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

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PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: LONG BEACH AIRPORT CA
MONTH: DECEMBER
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND

=====

1 2 3 4 5 6A 6B 7 8 9 10 11 12 13 14 15 16 17 18

12Z AVG MX 2MIN

DY MAX MIN AVG DEP HDD CDD WTR SNW DPTH SPD SPD DIR MIN PSBL S-S WX SPD DR

=====

1 68 48 58 0 7 0 0.00 M M 2.5 12 300 M M 5 128 13 300
2 62 52 57 -1 8 0 0.00 M M 3.1 9 300 M M 7 128 11 310
3 64 52 58 0 7 0 0.00 M M 3.6 14 280 M M 6 18 16 290
4 65 51 58 0 7 0 0.00 M M 3.6 13 290 M M 5 18 16 300
5 64 49 57 0 8 0 0.00 M M 1.6 6 290 M M 4 18 8 200
6 61 46 54 -3 11 0 0.00 M M 3.7 14 130 M M 7 128 14 150
7 64 52 58 1 7 0 0.02 M M 2.8 7 170 M M 6 18 10 160
8 67 49 58 1 7 0 0.00 M M 2.7 13 210 M M 2 18 15 200
9 59 53 56 -1 9 0 0.02 M M 7.5 16 270 M M 7 1 22 290
10 62 43 53 -4 12 0 0.00 M M 2.4 8 160 M M 0 1 15 150
11 68 44 56 -1 9 0 0.00 M M 3.8 9 220 M M 0 18 12 230
12 65 42 54 -2 11 0 0.00 M M 2.4 10 300 M M 0 8 12 300
13 61 46 54 -2 11 0 T M M 4.4 12 160 M M 8 18 15 160
14 60 43 52 -4 13 0 0.88 M M 12.7 29 290 M M 7 18 38 270
15 58 38 48 -8 17 0 0.00 M M 3.6 10 220 M M 0 13 200
16 58 40 49 -7 16 0 0.07 M M 3.4 10 300 M M 4 18 14 290
17 68 46 57 1 8 0 0.00 M M 2.9 12 300 M M 3 18 13 300
18 69 42 56 0 9 0 0.00 M M 3.7 10 290 M M 0 18 12 290
19 62 39 51 -5 14 0 0.00 M M 1.7 8 180 M M 0 18 12 160
20 66 41 54 -2 11 0 0.00 M M 1.4 8 280 M M 0 18 10 280
21 69 50 60 4 5 0 0.00 M M 1.6 9 320 M M 0 18 10 310
22 67 46 57 1 8 0 T M M 2.7 8 310 M M 2 18 10 310
23 58 52 55 -1 10 0 1.32 M M 6.8 21 130 M M 10 18 26 150
24 61 51 56 0 9 0 0.41 M M 6.4 18 270 M M 7 13 25 290
25 59 51 55 -1 10 0 0.29 M M 4.9 16 220 M M 9 1 23 220
26 59 46 53 -3 12 0 0.02 M M 5.4 18 280 M M 2 1 24 280
27 57 42 50 -6 15 0 0.04 M M 5.0 16 250 M M 5 1 23 220
28 56 47 52 -4 13 0 0.00 M M 5.8 17 210 M M 5 22 210
29 57 43 50 -6 15 0 0.60 M M 6.4 17 120 M M 8 1 22 130
30 56 50 53 -3 12 0 2.07 M M 6.9 18 130 M M 8 1 23 130
31 60 46 53 -4 12 0 0.00 M M 5.0 17 290 M M 3 1 20 290

=====

SM 1930 1440 323 0 5.74 M 130.4 M 130

=====

AV 62.3 46.5 4.2 FASTST M M 4 MAX(MPH)
MISC ----> 29 290 38 270

=====

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: LONG BEACH AIRPORT CA
MONTH: DECEMBER
YEAR: 2021
LATITUDE: 33 49 N
LONGITUDE: 118 9 W

[TEMPERATURE DATA] [PRECIPITATION DATA] SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 54.4 TOTAL FOR MONTH: 5.74 1 = FOG OR MIST
DPTR FM NORMAL: -2.3 DPTR FM NORMAL: 3.59 2 = FOG REDUCING VISIBILITY
HIGHEST: 69 ON 21,18 GRTST 24HR 2.42 ON 29-30 TO 1/4 MILE OR LESS
LOWEST: 38 ON 15 3 = THUNDER
SNOW, ICE PELLETS, HAIL 4 = ICE PELLETS
TOTAL MONTH: M 5 = HAIL

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CLIMATE REPORT

NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD

930 AM PST SAT JAN 01 2022

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...THE LONG BEACH AIRPORT CA CLIMATE SUMMARY FOR THE MONTH OF DECEMBER 2021...

CLIMATE NORMAL PERIOD: 1991 TO 2020

CLIMATE RECORD PERIOD: 1958 TO 2021

WEATHER	OBSERVED VALUE	DATE(S)	NORMAL VALUE	DEPART FROM NORMAL	LAST YEAR`S VALUE
---------	-------------------	---------	-----------------	--------------------------	----------------------

.....

TEMPERATURE (F)					
HIGHEST	69	12/18			
		12/21			
LOWEST	38	12/15			
AVG. MAXIMUM	62.3		66.7	-4.4	
AVG. MINIMUM	46.5		46.6	-0.1	
MEAN	54.4		56.7	-2.3	
DAYS MAX >= 90	0				
DAYS MAX <= 32	0				
DAYS MIN <= 32	0				
DAYS MIN <= 0	0				
PRECIPITATION (INCHES)					
TOTALS	5.74		2.15	3.59	
DAILY AVG.	0.19				
DAYS >= .01	11				
DAYS >= .10	6				
DAYS >= .50	4				
DAYS >= 1.00	2				
GREATEST					
24 HR. TOTAL	2.42	12/29 TO 12/30			
STORM TOTAL	2.07				
DEGREE DAYS					
HEATING TOTAL	323		261	62	207
SINCE 7/1	423		402	21	MM
COOLING TOTAL	0		2	-2	4
SINCE 1/1	1156		1166	-10	MM

.....

WIND (MPH)			
AVERAGE WIND SPEED	4.2		
HIGHEST WIND SPEED/DIRECTION	29/290	DATE	12/14
HIGHEST GUST SPEED/DIRECTION	38/270	DATE	12/14

SKY COVER	
POSSIBLE SUNSHINE (PERCENT)	MM
AVERAGE SKY COVER	0.42
NUMBER OF DAYS FAIR	13
NUMBER OF DAYS PC	13
NUMBER OF DAYS CLOUDY	5

AVERAGE RH (PERCENT)	
	73

WEATHER CONDITIONS. NUMBER OF DAYS WITH			
THUNDERSTORM	1	MIXED PRECIP	0
HEAVY RAIN	5	RAIN	7
LIGHT RAIN	11	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	28	FOG W/VIS <= 1/4 MILE	3
HAZE	20		

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

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Attachment 3

Dominguez Channel Estuary September 2021 Sediment Monitoring Report

Prepared for:

Tesoro Refining & Marketing Company LLC
Los Angeles Refinery – Carson Operations
1801 East Sepulveda Boulevard
Carson, CA 90745

Prepared by:

WGR Southwest, Inc.
11021 Winners Circle, Suite 101
Los Alamitos, CA 90720

Date:

January 21, 2022

**TESORO REFINING & MARKETING COMPANY LLC
LOS ANGELES REFINERY – CARSON OPERATIONS
DOMINGUEZ CHANNEL ESTUARY SEDIMENT MONITORING REPORT 2021**

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2.0	Sediment Monitoring	1
3.0	Laboratory Results.....	2
4.0	Executive Summary	2

TABLES

Table 2.0: Sediment Monitoring Field Observation and Analyses

FIGURES

Figure 1: Dominguez Channel Estuary Sediment Monitoring Locations

ATTACHMENTS

Attachment 1: Sediment Monitoring Field Logs

Attachment 2, Table 1: Sediment Monitoring Laboratory Result Summary Table

Attachment 2, Table 2: Sediment Monitoring Particle Grain Size Summary Table

Attachment 3: Sediment Monitoring Eurofins Calscience Analytical Laboratory Report

Attachment 4: Sediment Monitoring Aquatic Bioassay Analytical Laboratory Report

Attachment 5: Organic/Inorganic Analytical Validation Report

Attachment 6: Sediment Bioassay Data Validation Report

1.0 Introduction

On behalf of Tesoro Refining & Marketing Company LLC Los Angeles Refinery – Carson Operations (Tesoro LAR Carson), WGR Southwest, Inc. (WGR) conducted sediment monitoring of the Dominguez Channel Estuary in accordance with National Pollutant Discharge Elimination System Waste Discharge Requirements Permit Number CA0000680 Order Number R4-2015-0259 (WDR Permit). As required in Table E-7 of WDR Permit Attachment E, Monitoring and Reporting Program Number 5424 (MRP No. 5424), sediment monitoring is required at least once a year for all parameters and at least twice a year for Chronic Toxicity regardless of Tesoro LAR Carson discharge associated with the WDR Permit¹. Therefore, this report constitutes sediment monitoring for the first event of the 2021 reporting year, where the sediment samples collected were analyzed for all required parameters and all required monitoring (i.e. field observations and field analyses) was completed.

2.0 Sediment Monitoring

As shown in Figure 1, the WDR Permit designates seven sediment monitoring locations: SED-001, SED-002, SED-003, SED-004, SED-005, SED-006, and SED-007. WGR field personnel utilized an Ekman dredge and a Horiba U-50 Series Multi-Parameter Meter. According to historic Tesoro LAR Carson Sediment Monitoring Reports, samplers have been unable to collect sediment samples from SED-001 since 2003 and SED-002 since 2003.

Sediment monitoring was attempted at SED-001 and SED-002 sediment monitoring locations on September 8, 2021 and SED-003, SED-004, SED-005, SED-006 and SED-007 sediment monitoring locations on September 9, 2021. As detailed in the field logs (see Attachment 1), sediment samples and associated monitoring could only be feasibly completed at five of the seven sediment monitoring locations. Table 2.0 provides a summary of the field observations and analyses.

Table 2.0: Sediment Monitoring Field Observation and Analyses									
Sample ID	Field Observations			Field Analyses					
	Sediment Description	Biological Matter	Pollutants	pH (SU)	Salinity (PPT)	DO (mg/L)	SC (mS/Cm)	Turbidity (NTU)	Flow
SED-001	Not Sampled	Not Sampled	Not Sampled	--	--	--	--	--	--
SED-002	Not Sampled	Not Sampled	Not Sampled	--	--	--	--	--	--

¹ Tesoro LAR Carson did not discharge under the WDR Permit during the 2021 calendar year.

Table 2.0: Sediment Monitoring Field Observation and Analyses									
Sample ID	Field Observations			Field Analyses					
	Sediment Description	Biological Matter	Pollutants	pH (SU)	Salinity (PPT)	DO (mg/L)	SC (mS/Cm)	Turbidity (NTU)	Flow
SED-003	Dark in color, vegetation and debris, biological odor	Vegetation present	Trash present	7.82	24.76	9.11	37.6	20.7	--
SED-004	Dark in color with vegetation and debris	Vegetation present	Trash present	7.62	19.46	14.74	31.4	39.3	--
SED-005	Dark in color with vegetation and debris, biological odor	Vegetation present	Trash present	7.75	23.83	9.11	36.5	10.1	--
SED-006	Dark in color	Vegetation present	Trash present	6.65	21.59	14.39	34.9	14.8	--
SED-007	Dark in color with some vegetation/debris, shells, salty, biological odor	Vegetation present	Trash present	7.77	19.96	12.39	32.3	81.4	--
DO: Dissolved Oxygen									
SC: Specific Conductance									

3.0 Laboratory Results

Table 2.0 summarizes the field observations and analyses for the September 2021 sediment monitoring event. Laboratory results are summarized in Attachment 2. The Eurofins Calscience laboratory report is in Attachment 3 and the Aquatic Bioassay laboratory report is in Attachment 4. Data validation reports for these laboratory analytical reports are in Attachment 5 and Attachment 6.

4.0 Executive Summary

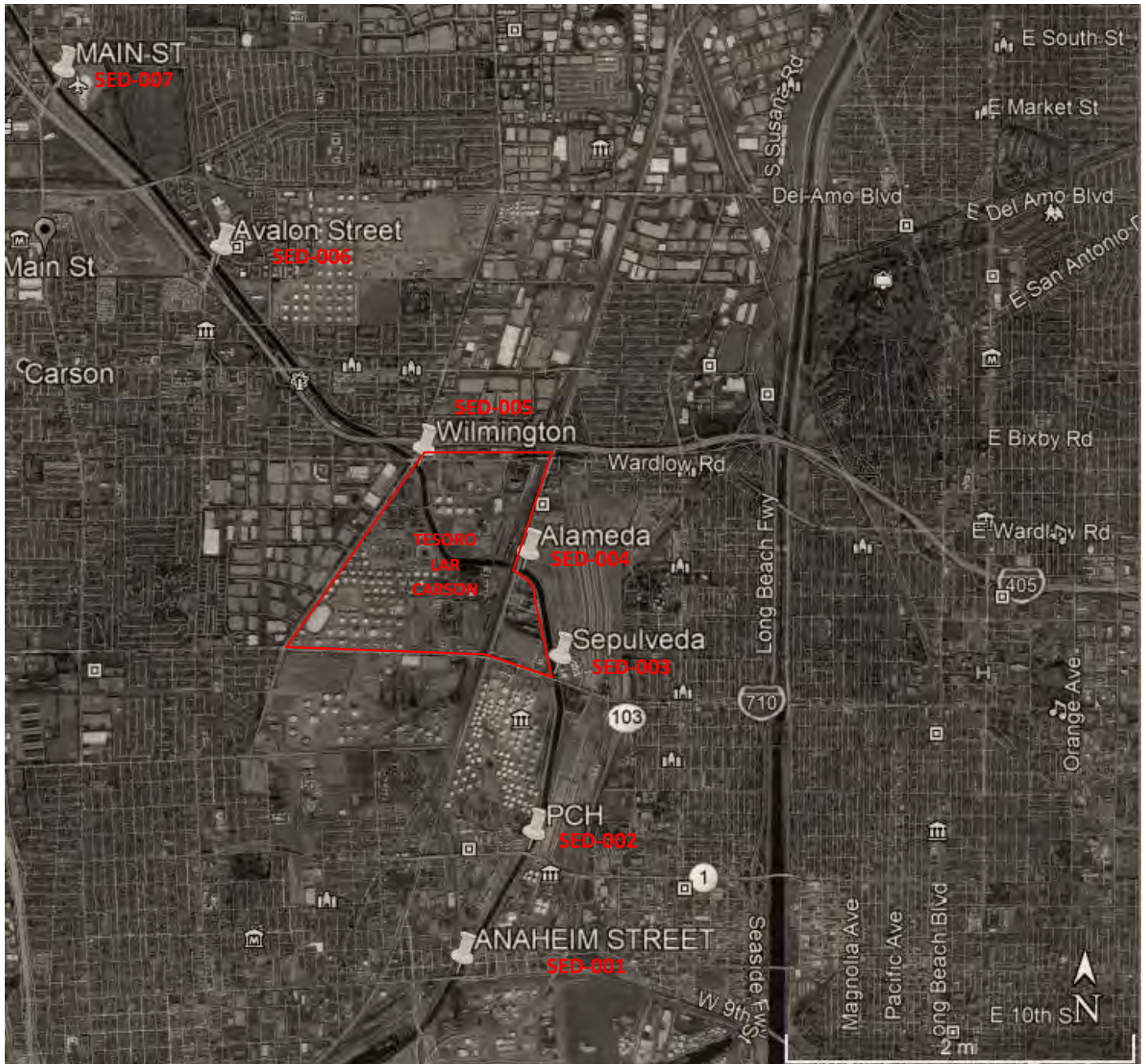
Receiving water sediment monitoring and analysis was conducted independent of any discharge from Tesoro LAR Carson. Pollutant concentrations demonstrated in this report are

not associated with any contribution from Tesoro LAR Carson to the receiving water. There are no pollutant concentration limits associated with this type of sampling as prescribed by the WDR Permit. Receiving water sediment monitoring and analysis was completed in compliance with the WDR Permit Attachment E, MRP No. 5424. As noted in the Organic/Inorganic Analytical Validation Report and the Sediment Bioassay Data Validation Report included in Attachment 5 and 6, respectively, analytical data obtained for this sampling event was deemed acceptable. No instances of non-compliance were identified.

FIGURE 1

DOMINGUEZ CHANNEL ESTUARY SEDIMENT MONITORING LOCATIONS

Figure 1: Dominguez Channel Estuary Sediment Monitoring Locations



ATTACHMENT 1

SEDIMENT MONITORING FIELD LOGS

P:\WGR\Forms

WGR Southwest, Inc. Field Log		Page <u>2</u> of <u>3</u>
		Date: <u>9/9/2021</u>
Project Name: <u>LARC Sediment 2021</u>	Field Personnel: <u>Dave Montelongo</u>	
Project Number: <u>021. APC. 01</u>	Field Personnel:	
Field Conditions/Project Discrepancies: <u>See pg 1</u>		
Time	Field Notes	
9:20	Arrived at SED-006. Weather Sunny/Clear. Water in Channel Vegetation & Trash along embankment. Walked 146ft from NW corner of bridge to center. Water level is 24ft from bridge railing. Water is murky, cannot see bottom. Sediment dark in color. 24.63°C, 6.65 pH, 34.9 mS/cm, 14.8 NTU, 14.39 mg/L DO, 20.6 g/L TDS, 21.59 ppt. Decon & packed.	
10:45	Left SED-006 for SED-007	
10:55	Arrived at SED-007. Weather is sunny/clear. Walked 56ft from SE corner of bridge to center. Water is 23ft from bridge railing. Trash & vegetation along embankment. Water is murky, cannot see bottom. Sediment dark in color w/ some vegetation and shells/debris. Salty w/ bittercomp odor. 26.53°C, 7.77 pH, 32.3 mS/cm, 81.4 NTU, 12.39 mg/L DO, 19.1 g/L TDS, 19.96 ppt. Decon & packed.	
11:45	Left SED-007 for Home Depot to get more Decon Water	
12:42	Arrived at SED-004. Weather Sunny/clear. Walked 85ft from SE corner of bridge to center. 19ft to water from bridge railing. Trash & Vegetation observed along embankment. Sediment dark in color w/ some vegetation & debris. 25.78°C, 7.62 pH, 31.4 mS/cm, 39.3 NTU, 14.74 mg/L DO, 17.9 g/L TDS, 19.46 ppt. Decon & packed.	
13:47	Left SED-004 for Lunch	

from NE
Corner

ATTACHMENT 2

SEDIMENT MONITORING LABORATORY RESULT SUMMARY TABLE AND PARTICLE GRAIN SIZE SUMMARY TABLE

Sample ID	SED-001	SED-002	SED-003	SED-004	SED-005	SED-006	SED-007
Date Sampled	NS	NS	9/9/2021	9/9/2021	9/9/2021	9/9/2021	9/9/2021
Time Sampled	NS	NS	17:55	13:30	15:45	10:25	11:30
Total Metals							
Cadmium (EPA 6020) (mg/Kg)	NS	NS	ND<2.82	ND<2.00	ND<2.31	ND<2.37	ND<2.37
Chromium (EPA 6020) (mg/Kg)	NS	NS	54.1	37.9	40.3	44.3	42.6
Copper (EPA 6020) (mg/Kg)	NS	NS	134	93.5	95.9	111	92.7
Lead (EPA 6020) (mg/Kg)	NS	NS	76.8	57.6	57.8	65.3	55.4
Nickel (EPA 6020) (mg/Kg)	NS	NS	19	13.3	14	14	13.4
Zinc (EPA 6020) (mg/Kg)	NS	NS	565	353	386	386	328
Mercury (EPA 7471A) (mg/Kg)	NS	NS	0.222	0.246	0.334	0.3590	0.206
Volatile/Semi-Volatile Organic Compounds							
Chlordane (EPA 8081A) (ug/Kg)	NS	NS	15	81	8.9	27	12
DDT (EPA 8081A) (ug/Kg, sum of 4,4'-DDT, 2,4'-DDT, 4,4'-DDE, 2,4'-DDE, 4,4'-DDD, and 2,4'-DDD)	NS	NS	53.4	33.2	28.5	51	20.7
PCBs (EPA 8082) (ug/Kg, sum of Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, and Arochlor 1260)	NS	NS	360	199	240	198	300
PAHs (EPA 8270C) (mg/Kg, sum of acenaphthene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo(k)fluoranthene, 1,12-benzoperylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, and pyrene)	NS	NS	4.771	2.566	2.243	1.57	1.618
Total Petroleum Hydrocarbons (EPA 8015B) (mg/Kg)	NS	NS	800	1100	1500	2000	940
Sediment Grain Size (ASTM D4464)	Refer to Attachment 2, Table 2						
Total Organic Carbon (EPA 9060A) (mg/Kg)	NS	NS	49,900	38,800	44,200	41,500	33,700
Tributyltin (Krone et al.) (ug/Kg)	NS	NS	6.4	ND<5.8	ND<7.0	5.6	ND<7.9
Chronic Toxicity							
Eohaustorius estuarius (NOEC in mg/L)	NS	NS	100%	100%	100%	100%	100%
Mytilus galloprovincialis (NOEC in mg/L)	NS	NS	100%	100%	100%	100%	100%

NS = Not Sampled

ND = Non-Detect

NOEC = No Observed Effect Concentration

Sample ID	Mean Grain Size (mm)	Particle Size Distribution (Weight Percent)								
		Total Silt & Clay (0 - 0.0626 mm)	Clay (< 0.00391 mm)	Silt (0.00391 - 0.0625 mm)	Very Fine Sand (0.0625 - 0.125 mm)	Fine Sand (0.125 - 0.25 mm)	Medium Sand (0.25 - 0.5 mm)	Coarse Sand (0.5 - 1 mm)	Very Coarse Sand (1 - 2 mm)	Gravel (>2 mm)
SED-001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SED-002	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SED-003	0.032	81.87	12.49	69.38	17.08	1.05	ND<0.01	ND<0.01	ND<0.01	ND<0.01
SED-004	0.034	79.99	11.66	68.33	19.25	0.76	ND<0.01	ND<0.01	ND<0.01	ND<0.01
SED-005	0.029	83.64	13.54	70.10	15.64	0.71	ND<0.01	ND<0.01	ND<0.01	ND<0.01
SED-006	0.040	75.76	7.33	68.44	21.91	2.32	ND<0.01	ND<0.01	ND<0.01	ND<0.01
SED-007	0.043	73.8	6.4	67.41	23.19	3.01	ND<0.01	ND<0.01	ND<0.01	ND<0.01

NS = Not Sampled

ND = Non-Detect

ATTACHMENT 3

SEDIMENT MONITORING EUROFINS CALSCIENCE ANALYTICAL LABORATORY REPORT

ANALYTICAL REPORT

Eurofins Calscience LLC
7440 Lincoln Way
Garden Grove, CA 92841
Tel: (714)895-5494

Laboratory Job ID: 570-69878-1
Client Project/Site: Tesoro LA Refinery

For:
WGR Southwest Inc
11021 Winners Circle
Suite 101
Los Alamitos, California 90720

Attn: Chelsea Dreyer



Authorized for release by:
9/27/2021 4:34:31 PM
Sheila Luu, Project Mgmt. Assistant
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Designee for
Xuan Dang, Project Manager I
(714)895-5494
Xuan.Dang@eurofinset.com

LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Eurofins Calscience LLC

Definitions/Glossary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TNTC	Too Numerous To Count

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Case Narrative

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Job ID: 570-69878-1

Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-69878-1

Comments

No additional comments.

Receipt

The samples were received on 9/13/2021 1:50 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.9° C.

GC/MS Semi VOA

Method 8270C SIM: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-178989 and 570-180052 and analytical batch 570-180477 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 8270C SIM: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for preparation batch 570-178989 and 570-180052 and analytical batch 570-180477 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

Method Organotins SIM: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-179948 and analytical batch 570-181787 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

Method 8015B: The native sample, matrix spike, and matrix spike duplicate (MS/MSD) associated with preparation batch 570-179051 and analytical batch 570-179136 were performed at the same dilution. Due to the additional level of analyte present in the spiked samples, the concentration of Diesel Range Organics [C10-C28] and C23-C40 in the MS/MSD was above the instrument calibration range. The data have been reported and qualified.

Method 8081A: The following samples were diluted 5X due to the nature of the sample matrix: SED-003 (570-69878-1), SED-004 (570-69878-2), SED-005 (570-69878-3), SED-006 (570-69878-4) and SED-007 (570-69878-5). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

Method 6020: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-178989 and 570-181268 and analytical batch 570-181377 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 6020: Due to the high concentration of Zinc, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 570-178989 and 570-181268 and analytical batch 570-181377 could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method D4464: The sample duplicate precision for the following sample associated with analytical batch 570-181620 was flagged as being outside control limits due to a L.I.M.S. limitation: (570-70713-A-1) and (570-70713-A-1 DU). The mean grain size for the sample and

Case Narrative

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Job ID: 570-69878-1 (Continued)

Laboratory: Eurofins Calscience LLC (Continued)

sample duplicate were within RPD acceptance criteria. Method D4464.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Detection Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-003

Lab Sample ID: 570-69878-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Acenaphthene	0.046	J	0.057	0.0029	mg/Kg	2	✱		8270C SIM	Total/NA
Anthracene	0.10		0.057	0.0038	mg/Kg	2	✱		8270C SIM	Total/NA
1,2-Benzanthracene	0.28		0.057	0.0063	mg/Kg	2	✱		8270C SIM	Total/NA
Benzo[a]pyrene	0.45		0.057	0.0077	mg/Kg	2	✱		8270C SIM	Total/NA
3,4-Benzofluoranthene	0.43		0.057	0.0082	mg/Kg	2	✱		8270C SIM	Total/NA
Benzo[k]fluoranthene	0.40		0.057	0.0092	mg/Kg	2	✱		8270C SIM	Total/NA
1,12-Benzoperylene	0.35		0.057	0.0083	mg/Kg	2	✱		8270C SIM	Total/NA
Chrysene	0.55		0.057	0.0044	mg/Kg	2	✱		8270C SIM	Total/NA
Dibenz(a,h)anthracene	0.13		0.057	0.0060	mg/Kg	2	✱		8270C SIM	Total/NA
Fluoranthene	0.84		0.057	0.0055	mg/Kg	2	✱		8270C SIM	Total/NA
Fluorene	0.065		0.057	0.0047	mg/Kg	2	✱		8270C SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.21		0.057	0.0071	mg/Kg	2	✱		8270C SIM	Total/NA
1-Methylnaphthalene	0.014	J	0.057	0.0041	mg/Kg	2	✱		8270C SIM	Total/NA
2-Methylnaphthalene	0.035	J	0.057	0.0041	mg/Kg	2	✱		8270C SIM	Total/NA
Naphthalene	0.030	J	0.057	0.0044	mg/Kg	2	✱		8270C SIM	Total/NA
Phenanthrene	0.40		0.057	0.0048	mg/Kg	2	✱		8270C SIM	Total/NA
Pyrene	0.92		0.057	0.0043	mg/Kg	2	✱		8270C SIM	Total/NA
Tributyltin	6.4	J	8.5	4.2	ug/Kg	1	✱		Organotins SIM	Total/NA
C9-C10	12	J	14	11	mg/Kg	1	✱		8015B	Total/NA
C13-C14	15		14	11	mg/Kg	1	✱		8015B	Total/NA
C15-C16	110		14	11	mg/Kg	1	✱		8015B	Total/NA
C17-C18	17		14	11	mg/Kg	1	✱		8015B	Total/NA
C19-C20	19		14	11	mg/Kg	1	✱		8015B	Total/NA
C21-C22	35		14	11	mg/Kg	1	✱		8015B	Total/NA
C23-C24	61		14	11	mg/Kg	1	✱		8015B	Total/NA
C25-C28	170		14	11	mg/Kg	1	✱		8015B	Total/NA
C29-C32	190		14	11	mg/Kg	1	✱		8015B	Total/NA
C33-C36	130		14	11	mg/Kg	1	✱		8015B	Total/NA
C37-C40	50		14	11	mg/Kg	1	✱		8015B	Total/NA
C6-C44	800		14	11	mg/Kg	1	✱		8015B	Total/NA
2,4'-DDD	3.4	J p	5.0	0.32	ug/Kg	5			8081A	Total/NA
2,4'-DDE	11	p	10	0.49	ug/Kg	5			8081A	Total/NA
4,4'-DDD	18	F1	5.0	2.5	ug/Kg	5			8081A	Total/NA
4,4'-DDE	21		5.0	0.36	ug/Kg	5			8081A	Total/NA
Chlordane	15	J	25	1.6	ug/Kg	5			8081A	Total/NA
Aroclor-1254	180		29	14	ug/Kg	1	✱		8082	Total/NA
Aroclor-1260	180	F1	29	14	ug/Kg	1	✱		8082	Total/NA
Chromium	54.1		5.63	0.845	mg/Kg	20	✱		6020	Total/NA
Copper	134	F1	2.82	0.758	mg/Kg	20	✱		6020	Total/NA
Lead	76.8	F1	2.82	0.605	mg/Kg	20	✱		6020	Total/NA
Nickel	19.0		2.82	0.760	mg/Kg	20	✱		6020	Total/NA
Zinc	565		14.1	13.0	mg/Kg	20	✱		6020	Total/NA
Mercury	0.222	J	0.234	0.0380	mg/Kg	1	✱		7471A	Total/NA
Carbon, Total Organic	49900		1430	496	mg/Kg	1	✱		9060A	Total/NA
Clay (less than 0.00391 mm)	12.49		0.01	0.01	%	1			D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	1.05		0.01	0.01	%	1			D4464	Total/NA
Silt (0.00391 to 0.0625mm)	69.38		0.01	0.01	%	1			D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	81.87		0.01	0.01	%	1			D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	17.08		0.01	0.01	%	1			D4464	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Detection Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-004

Lab Sample ID: 570-69878-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.0086	J	0.040	0.0020	mg/Kg	2	✱	8270C SIM	Total/NA
Anthracene	0.053		0.040	0.0026	mg/Kg	2	✱	8270C SIM	Total/NA
1,2-Benzanthracene	0.16		0.040	0.0044	mg/Kg	2	✱	8270C SIM	Total/NA
Benzo[a]pyrene	0.24		0.040	0.0054	mg/Kg	2	✱	8270C SIM	Total/NA
3,4-Benzofluoranthene	0.23		0.040	0.0057	mg/Kg	2	✱	8270C SIM	Total/NA
Benzo[k]fluoranthene	0.19		0.040	0.0064	mg/Kg	2	✱	8270C SIM	Total/NA
1,12-Benzoperylene	0.21		0.040	0.0058	mg/Kg	2	✱	8270C SIM	Total/NA
Chrysene	0.34		0.040	0.0031	mg/Kg	2	✱	8270C SIM	Total/NA
Fluoranthene	0.42		0.040	0.0038	mg/Kg	2	✱	8270C SIM	Total/NA
Fluorene	0.014	J	0.040	0.0033	mg/Kg	2	✱	8270C SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.13		0.040	0.0049	mg/Kg	2	✱	8270C SIM	Total/NA
1-Methylnaphthalene	0.011	J	0.040	0.0028	mg/Kg	2	✱	8270C SIM	Total/NA
2-Methylnaphthalene	0.020	J	0.040	0.0028	mg/Kg	2	✱	8270C SIM	Total/NA
Naphthalene	0.021	J	0.040	0.0031	mg/Kg	2	✱	8270C SIM	Total/NA
Phenanthrene	0.18		0.040	0.0033	mg/Kg	2	✱	8270C SIM	Total/NA
Pyrene	0.57		0.040	0.0030	mg/Kg	2	✱	8270C SIM	Total/NA
C13-C14	8.7	J	10	7.7	mg/Kg	1	✱	8015B	Total/NA
C15-C16	22		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C17-C18	27		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C19-C20	120		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C21-C22	96		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C23-C24	100		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C25-C28	240		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C29-C32	250		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C33-C36	180		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C37-C40	59		10	7.7	mg/Kg	1	✱	8015B	Total/NA
C6-C44	1100		10	7.7	mg/Kg	1	✱	8015B	Total/NA
2,4'-DDD	2.5	J p	5.0	0.32	ug/Kg	5		8081A	Total/NA
2,4'-DDE	0.63	J p	10	0.48	ug/Kg	5		8081A	Total/NA
4,4'-DDD	8.1	p	5.0	2.5	ug/Kg	5		8081A	Total/NA
4,4'-DDE	22		5.0	0.35	ug/Kg	5		8081A	Total/NA
Chlordane	81		25	1.6	ug/Kg	5		8081A	Total/NA
Aroclor-1254	89		20	9.9	ug/Kg	1	✱	8082	Total/NA
Aroclor-1260	110		20	9.9	ug/Kg	1	✱	8082	Total/NA
Chromium	37.9		4.00	0.600	mg/Kg	20	✱	6020	Total/NA
Copper	93.5		2.00	0.538	mg/Kg	20	✱	6020	Total/NA
Lead	57.6		2.00	0.430	mg/Kg	20	✱	6020	Total/NA
Nickel	13.3		2.00	0.540	mg/Kg	20	✱	6020	Total/NA
Zinc	353		10.0	9.24	mg/Kg	20	✱	6020	Total/NA
Mercury	0.246		0.158	0.0256	mg/Kg	1	✱	7471A	Total/NA
Carbon, Total Organic	38800		995	346	mg/Kg	1	✱	9060A	Total/NA
Clay (less than 0.00391 mm)	11.66		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	0.76		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	68.33		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	79.99		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	19.25		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: SED-005

Lab Sample ID: 570-69878-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.0081	J	0.047	0.0024	mg/Kg	2	✱	8270C SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Detection Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-005 (Continued)

Lab Sample ID: 570-69878-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Anthracene	0.058		0.047	0.0032	mg/Kg	2		✱	8270C SIM	Total/NA
1,2-Benzanthracene	0.13		0.047	0.0052	mg/Kg	2		✱	8270C SIM	Total/NA
Benzo[a]pyrene	0.22		0.047	0.0064	mg/Kg	2		✱	8270C SIM	Total/NA
3,4-Benzofluoranthene	0.26		0.047	0.0068	mg/Kg	2		✱	8270C SIM	Total/NA
Benzo[k]fluoranthene	0.17		0.047	0.0076	mg/Kg	2		✱	8270C SIM	Total/NA
1,12-Benzoperylene	0.16		0.047	0.0068	mg/Kg	2		✱	8270C SIM	Total/NA
Chrysene	0.31		0.047	0.0036	mg/Kg	2		✱	8270C SIM	Total/NA
Fluoranthene	0.36		0.047	0.0045	mg/Kg	2		✱	8270C SIM	Total/NA
Fluorene	0.017	J	0.047	0.0039	mg/Kg	2		✱	8270C SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.090		0.047	0.0059	mg/Kg	2		✱	8270C SIM	Total/NA
1-Methylnaphthalene	0.012	J	0.047	0.0034	mg/Kg	2		✱	8270C SIM	Total/NA
2-Methylnaphthalene	0.025	J	0.047	0.0034	mg/Kg	2		✱	8270C SIM	Total/NA
Naphthalene	0.026	J	0.047	0.0036	mg/Kg	2		✱	8270C SIM	Total/NA
Phenanthrene	0.17		0.047	0.0040	mg/Kg	2		✱	8270C SIM	Total/NA
Pyrene	0.46		0.047	0.0035	mg/Kg	2		✱	8270C SIM	Total/NA
C15-C16	21		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C17-C18	33		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C19-C20	50		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C21-C22	86		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C23-C24	140		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C25-C28	400		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C29-C32	420		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C33-C36	250		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C37-C40	98		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C41-C44	18		12	9.2	mg/Kg	1		✱	8015B	Total/NA
C6-C44	1500		12	9.2	mg/Kg	1		✱	8015B	Total/NA
2,4'-DDD	1.3	J p	5.0	0.32	ug/Kg	5			8081A	Total/NA
2,4'-DDE	2.5	J p	10	0.48	ug/Kg	5			8081A	Total/NA
4,4'-DDD	6.7	p	5.0	2.5	ug/Kg	5			8081A	Total/NA
4,4'-DDE	18		5.0	0.35	ug/Kg	5			8081A	Total/NA
Chlordane	8.9	J p	25	1.6	ug/Kg	5			8081A	Total/NA
Aroclor-1254	130		24	12	ug/Kg	1		✱	8082	Total/NA
Aroclor-1260	110		24	12	ug/Kg	1		✱	8082	Total/NA
Chromium	40.3		4.63	0.694	mg/Kg	20		✱	6020	Total/NA
Copper	95.9		2.31	0.623	mg/Kg	20		✱	6020	Total/NA
Lead	57.8		2.31	0.498	mg/Kg	20		✱	6020	Total/NA
Nickel	14.0		2.31	0.625	mg/Kg	20		✱	6020	Total/NA
Zinc	386		11.6	10.7	mg/Kg	20		✱	6020	Total/NA
Mercury	0.334		0.208	0.0337	mg/Kg	1		✱	7471A	Total/NA
Carbon, Total Organic	44200		1190	412	mg/Kg	1		✱	9060A	Total/NA
Clay (less than 0.00391 mm)	13.54		0.01	0.01	%	1			D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	0.71		0.01	0.01	%	1			D4464	Total/NA
Silt (0.00391 to 0.0625mm)	70.10		0.01	0.01	%	1			D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	83.64		0.01	0.01	%	1			D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	15.64		0.01	0.01	%	1			D4464	Total/NA

Client Sample ID: SED-006

Lab Sample ID: 570-69878-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Anthracene	0.031	J	0.047	0.0032	mg/Kg	2		✱	8270C SIM	Total/NA
1,2-Benzanthracene	0.087		0.047	0.0052	mg/Kg	2		✱	8270C SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Detection Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-006 (Continued)

Lab Sample ID: 570-69878-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]pyrene	0.13		0.047	0.0064	mg/Kg	2	✱	8270C SIM	Total/NA
3,4-Benzofluoranthene	0.16		0.047	0.0068	mg/Kg	2	✱	8270C SIM	Total/NA
Benzo[k]fluoranthene	0.098		0.047	0.0076	mg/Kg	2	✱	8270C SIM	Total/NA
1,12-Benzoperylene	0.11		0.047	0.0069	mg/Kg	2	✱	8270C SIM	Total/NA
Chrysene	0.21		0.047	0.0037	mg/Kg	2	✱	8270C SIM	Total/NA
Fluoranthene	0.29		0.047	0.0046	mg/Kg	2	✱	8270C SIM	Total/NA
Fluorene	0.015	J	0.047	0.0039	mg/Kg	2	✱	8270C SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.069		0.047	0.0059	mg/Kg	2	✱	8270C SIM	Total/NA
1-Methylnaphthalene	0.0079	J	0.047	0.0034	mg/Kg	2	✱	8270C SIM	Total/NA
2-Methylnaphthalene	0.015	J	0.047	0.0034	mg/Kg	2	✱	8270C SIM	Total/NA
Naphthalene	0.018	J	0.047	0.0037	mg/Kg	2	✱	8270C SIM	Total/NA
Phenanthrene	0.098		0.047	0.0040	mg/Kg	2	✱	8270C SIM	Total/NA
Pyrene	0.37		0.047	0.0035	mg/Kg	2	✱	8270C SIM	Total/NA
Tributyltin	5.6	J	7.0	3.5	ug/Kg	1	✱	Organotins SIM	Total/NA
C13-C14	13		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C15-C16	22		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C17-C18	22		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C19-C20	33		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C21-C22	79		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C23-C24	180		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C25-C28	580		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C29-C32	640		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C33-C36	350		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C37-C40	140		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C41-C44	28		12	9.1	mg/Kg	1	✱	8015B	Total/NA
C6-C44	2000		12	9.1	mg/Kg	1	✱	8015B	Total/NA
2,4'-DDD	5.2	p	5.0	0.32	ug/Kg	5		8081A	Total/NA
2,4'-DDE	5.8	J p	9.9	0.48	ug/Kg	5		8081A	Total/NA
4,4'-DDD	23		5.0	2.5	ug/Kg	5		8081A	Total/NA
4,4'-DDE	17		5.0	0.35	ug/Kg	5		8081A	Total/NA
Chlordane	27		25	1.6	ug/Kg	5		8081A	Total/NA
Aroclor-1254	100		24	12	ug/Kg	1	✱	8082	Total/NA
Aroclor-1260	98		24	12	ug/Kg	1	✱	8082	Total/NA
Chromium	44.3		4.75	0.712	mg/Kg	20	✱	6020	Total/NA
Copper	111		2.37	0.639	mg/Kg	20	✱	6020	Total/NA
Lead	65.3		2.37	0.510	mg/Kg	20	✱	6020	Total/NA
Nickel	14.0		2.37	0.641	mg/Kg	20	✱	6020	Total/NA
Zinc	386		11.9	11.0	mg/Kg	20	✱	6020	Total/NA
Mercury	0.359		0.195	0.0315	mg/Kg	1	✱	7471A	Total/NA
Carbon, Total Organic	41500		1190	412	mg/Kg	1	✱	9060A	Total/NA
Clay (less than 0.00391 mm)	7.33		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	2.32		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	68.44		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	75.76		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	21.91		0.01	0.01	%	1		D4464	Total/NA

Client Sample ID: SED-007

Lab Sample ID: 570-69878-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Anthracene	0.033	J	0.13	0.0089	mg/Kg	5	✱	8270C SIM	Total/NA
1,2-Benzanthracene	0.10	J	0.13	0.015	mg/Kg	5	✱	8270C SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Detection Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-007 (Continued)

Lab Sample ID: 570-69878-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]pyrene	0.13		0.13	0.018	mg/Kg	5	✱	8270C SIM	Total/NA
3,4-Benzofluoranthene	0.16		0.13	0.019	mg/Kg	5	✱	8270C SIM	Total/NA
Benzo[k]fluoranthene	0.12	J	0.13	0.022	mg/Kg	5	✱	8270C SIM	Total/NA
1,12-Benzoperylene	0.10	J	0.13	0.019	mg/Kg	5	✱	8270C SIM	Total/NA
Chrysene	0.22		0.13	0.010	mg/Kg	5	✱	8270C SIM	Total/NA
Fluoranthene	0.29		0.13	0.013	mg/Kg	5	✱	8270C SIM	Total/NA
Fluorene	0.017	J	0.13	0.011	mg/Kg	5	✱	8270C SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.068	J	0.13	0.017	mg/Kg	5	✱	8270C SIM	Total/NA
2-Methylnaphthalene	0.027	J	0.13	0.0096	mg/Kg	5	✱	8270C SIM	Total/NA
Naphthalene	0.037	J	0.13	0.010	mg/Kg	5	✱	8270C SIM	Total/NA
Phenanthrene	0.11	J	0.13	0.011	mg/Kg	5	✱	8270C SIM	Total/NA
Pyrene	0.38		0.13	0.010	mg/Kg	5	✱	8270C SIM	Total/NA
C17-C18	19		14	10	mg/Kg	1	✱	8015B	Total/NA
C19-C20	33		14	10	mg/Kg	1	✱	8015B	Total/NA
C21-C22	54		14	10	mg/Kg	1	✱	8015B	Total/NA
C23-C24	92		14	10	mg/Kg	1	✱	8015B	Total/NA
C25-C28	260		14	10	mg/Kg	1	✱	8015B	Total/NA
C29-C32	270		14	10	mg/Kg	1	✱	8015B	Total/NA
C33-C36	160		14	10	mg/Kg	1	✱	8015B	Total/NA
C37-C40	59		14	10	mg/Kg	1	✱	8015B	Total/NA
C41-C44	14		14	10	mg/Kg	1	✱	8015B	Total/NA
C6-C44	940		14	10	mg/Kg	1	✱	8015B	Total/NA
2,4'-DDD	1.0	J p	5.0	0.32	ug/Kg	5		8081A	Total/NA
2,4'-DDE	1.6	J p	9.9	0.48	ug/Kg	5		8081A	Total/NA
4,4'-DDD	10	p	5.0	2.5	ug/Kg	5		8081A	Total/NA
4,4'-DDE	8.1	p	5.0	0.35	ug/Kg	5		8081A	Total/NA
Chlordane	12	J p	25	1.6	ug/Kg	5		8081A	Total/NA
Aroclor-1254	110		27	13	ug/Kg	1	✱	8082	Total/NA
Aroclor-1260	190		27	13	ug/Kg	1	✱	8082	Total/NA
Chromium	42.6		5.45	0.818	mg/Kg	20	✱	6020	Total/NA
Copper	92.7		2.73	0.733	mg/Kg	20	✱	6020	Total/NA
Lead	55.4		2.73	0.586	mg/Kg	20	✱	6020	Total/NA
Nickel	13.4		2.73	0.736	mg/Kg	20	✱	6020	Total/NA
Zinc	328		13.6	12.6	mg/Kg	20	✱	6020	Total/NA
Mercury	0.206	J	0.224	0.0362	mg/Kg	1	✱	7471A	Total/NA
Carbon, Total Organic	33700		1340	466	mg/Kg	1	✱	9060A	Total/NA
Clay (less than 0.00391 mm)	6.40		0.01	0.01	%	1		D4464	Total/NA
Fine Sand (0.125 to 0.25mm)	3.01		0.01	0.01	%	1		D4464	Total/NA
Silt (0.00391 to 0.0625mm)	67.41		0.01	0.01	%	1		D4464	Total/NA
Total Silt and Clay (0 to 0.0626mm)	73.80		0.01	0.01	%	1		D4464	Total/NA
Very Fine Sand (0.0625 to 0.125 mm)	23.19		0.01	0.01	%	1		D4464	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Calscience LLC

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.046	J	0.057	0.0029	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Acenaphthylene	ND		0.057	0.048	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Anthracene	0.10		0.057	0.0038	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
1,2-Benzanthracene	0.28		0.057	0.0063	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Benzo[a]pyrene	0.45		0.057	0.0077	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
3,4-Benzofluoranthene	0.43		0.057	0.0082	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Benzo[k]fluoranthene	0.40		0.057	0.0092	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
1,12-Benzoperylene	0.35		0.057	0.0083	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Chrysene	0.55		0.057	0.0044	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Dibenz(a,h)anthracene	0.13		0.057	0.0060	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Fluoranthene	0.84		0.057	0.0055	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Fluorene	0.065		0.057	0.0047	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Indeno[1,2,3-cd]pyrene	0.21		0.057	0.0071	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
1-Methylnaphthalene	0.014	J	0.057	0.0041	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
2-Methylnaphthalene	0.035	J	0.057	0.0041	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Naphthalene	0.030	J	0.057	0.0044	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Phenanthrene	0.40		0.057	0.0048	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Pyrene	0.92		0.057	0.0043	mg/Kg	☆	09/17/21 18:49	09/20/21 21:52	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	70		22 - 130				09/17/21 18:49	09/20/21 21:52	2
Nitrobenzene-d5 (Surr)	44		20 - 145				09/17/21 18:49	09/20/21 21:52	2
p-Terphenyl-d14 (Surr)	90		33 - 147				09/17/21 18:49	09/20/21 21:52	2

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.0086	J	0.040	0.0020	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Acenaphthylene	ND		0.040	0.034	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Anthracene	0.053		0.040	0.0026	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
1,2-Benzanthracene	0.16		0.040	0.0044	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Benzo[a]pyrene	0.24		0.040	0.0054	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
3,4-Benzofluoranthene	0.23		0.040	0.0057	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Benzo[k]fluoranthene	0.19		0.040	0.0064	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
1,12-Benzoperylene	0.21		0.040	0.0058	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Chrysene	0.34		0.040	0.0031	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Dibenz(a,h)anthracene	ND		0.040	0.0042	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Fluoranthene	0.42		0.040	0.0038	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Fluorene	0.014	J	0.040	0.0033	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Indeno[1,2,3-cd]pyrene	0.13		0.040	0.0049	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
1-Methylnaphthalene	0.011	J	0.040	0.0028	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
2-Methylnaphthalene	0.020	J	0.040	0.0028	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Naphthalene	0.021	J	0.040	0.0031	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Phenanthrene	0.18		0.040	0.0033	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Pyrene	0.57		0.040	0.0030	mg/Kg	☆	09/17/21 18:49	09/23/21 03:11	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	61		22 - 130				09/17/21 18:49	09/23/21 03:11	2
Nitrobenzene-d5 (Surr)	36		20 - 145				09/17/21 18:49	09/23/21 03:11	2

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Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM) (Continued)

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	81		33 - 147	09/17/21 18:49	09/23/21 03:11	2

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.0081	J	0.047	0.0024	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Acenaphthylene	ND		0.047	0.040	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Anthracene	0.058		0.047	0.0032	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
1,2-Benzanthracene	0.13		0.047	0.0052	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Benzo[a]pyrene	0.22		0.047	0.0064	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
3,4-Benzofluoranthene	0.26		0.047	0.0068	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Benzo[k]fluoranthene	0.17		0.047	0.0076	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
1,12-Benzoperylene	0.16		0.047	0.0068	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Chrysene	0.31		0.047	0.0036	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Dibenz(a,h)anthracene	ND		0.047	0.0050	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Fluoranthene	0.36		0.047	0.0045	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Fluorene	0.017	J	0.047	0.0039	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Indeno[1,2,3-cd]pyrene	0.090		0.047	0.0059	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
1-Methylnaphthalene	0.012	J	0.047	0.0034	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
2-Methylnaphthalene	0.025	J	0.047	0.0034	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Naphthalene	0.026	J	0.047	0.0036	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Phenanthrene	0.17		0.047	0.0040	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2
Pyrene	0.46		0.047	0.0035	mg/Kg	☆	09/17/21 18:49	09/23/21 03:30	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	72		22 - 130	09/17/21 18:49	09/23/21 03:30	2
Nitrobenzene-d5 (Surr)	45		20 - 145	09/17/21 18:49	09/23/21 03:30	2
p-Terphenyl-d14 (Surr)	91		33 - 147	09/17/21 18:49	09/23/21 03:30	2

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.047	0.0024	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Acenaphthylene	ND		0.047	0.040	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Anthracene	0.031	J	0.047	0.0032	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
1,2-Benzanthracene	0.087		0.047	0.0052	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Benzo[a]pyrene	0.13		0.047	0.0064	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
3,4-Benzofluoranthene	0.16		0.047	0.0068	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Benzo[k]fluoranthene	0.098		0.047	0.0076	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
1,12-Benzoperylene	0.11		0.047	0.0069	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Chrysene	0.21		0.047	0.0037	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Dibenz(a,h)anthracene	ND		0.047	0.0050	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Fluoranthene	0.29		0.047	0.0046	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Fluorene	0.015	J	0.047	0.0039	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Indeno[1,2,3-cd]pyrene	0.069		0.047	0.0059	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
1-Methylnaphthalene	0.0079	J	0.047	0.0034	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
2-Methylnaphthalene	0.015	J	0.047	0.0034	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Naphthalene	0.018	J	0.047	0.0037	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2

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Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM) (Continued)

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenanthrene	0.098		0.047	0.0040	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Pyrene	0.37		0.047	0.0035	mg/Kg	☆	09/17/21 18:49	09/23/21 03:50	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	56		22 - 130				09/17/21 18:49	09/23/21 03:50	2
Nitrobenzene-d5 (Surr)	34		20 - 145				09/17/21 18:49	09/23/21 03:50	2
p-Terphenyl-d14 (Surr)	80		33 - 147				09/17/21 18:49	09/23/21 03:50	2

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.13	0.0067	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Acenaphthylene	ND		0.13	0.11	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Anthracene	0.033	J	0.13	0.0089	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
1,2-Benzanthracene	0.10	J	0.13	0.015	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Benzo[a]pyrene	0.13		0.13	0.018	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
3,4-Benzofluoranthene	0.16		0.13	0.019	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Benzo[k]fluoranthene	0.12	J	0.13	0.022	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
1,12-Benzoperylene	0.10	J	0.13	0.019	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Chrysene	0.22		0.13	0.010	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Dibenz(a,h)anthracene	ND		0.13	0.014	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Fluoranthene	0.29		0.13	0.013	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Fluorene	0.017	J	0.13	0.011	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Indeno[1,2,3-cd]pyrene	0.068	J	0.13	0.017	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
1-Methylnaphthalene	ND		0.13	0.0096	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
2-Methylnaphthalene	0.027	J	0.13	0.0096	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Naphthalene	0.037	J	0.13	0.010	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Phenanthrene	0.11	J	0.13	0.011	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Pyrene	0.38		0.13	0.010	mg/Kg	☆	09/17/21 18:49	09/23/21 04:10	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	71		22 - 130				09/17/21 18:49	09/23/21 04:10	5
Nitrobenzene-d5 (Surr)	54		20 - 145				09/17/21 18:49	09/23/21 04:10	5
p-Terphenyl-d14 (Surr)	103		33 - 147				09/17/21 18:49	09/23/21 04:10	5

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: Organotins SIM - Organotins (GC/MS SIM)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	6.4	J	8.5	4.2	ug/Kg	☆	09/17/21 12:08	09/24/21 22:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Triphenyltin	80		10 - 120				09/17/21 12:08	09/24/21 22:36	1

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		5.8	2.9	ug/Kg	☆	09/17/21 12:08	09/24/21 22:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Triphenyltin	104		10 - 120				09/17/21 12:08	09/24/21 22:54	1

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		7.0	3.5	ug/Kg	☆	09/17/21 12:08	09/24/21 23:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Triphenyltin	91		10 - 120				09/17/21 12:08	09/24/21 23:11	1

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	5.6	J	7.0	3.5	ug/Kg	☆	09/17/21 12:08	09/24/21 23:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Triphenyltin	90		10 - 120				09/17/21 12:08	09/24/21 23:28	1

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		7.9	3.9	ug/Kg	☆	09/17/21 12:08	09/24/21 23:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Triphenyltin	95		10 - 120				09/17/21 12:08	09/24/21 23:46	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8015B - Diesel Range Organics (DRO) (GC)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6 as C6	ND		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C7 as C7	ND		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C8 as C8	ND		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C9-C10	12	J	14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C11-C12	ND		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C13-C14	15		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C15-C16	110		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C17-C18	17		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C19-C20	19		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C21-C22	35		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C23-C24	61		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C25-C28	170		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C29-C32	190		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C33-C36	130		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C37-C40	50		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C41-C44	ND		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1
C6-C44	800		14	11	mg/Kg	☆	09/14/21 12:44	09/16/21 08:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane (Surr)	122		60 - 138	09/14/21 12:44	09/16/21 08:37	1

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6 as C6	ND		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C7 as C7	ND		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C8 as C8	ND		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C9-C10	ND		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C11-C12	ND		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C13-C14	8.7	J	10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C15-C16	22		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C17-C18	27		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C19-C20	120		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C21-C22	96		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C23-C24	100		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C25-C28	240		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C29-C32	250		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C33-C36	180		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C37-C40	59		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C41-C44	ND		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1
C6-C44	1100		10	7.7	mg/Kg	☆	09/14/21 12:44	09/16/21 08:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane (Surr)	127		60 - 138	09/14/21 12:44	09/16/21 08:59	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8015B - Diesel Range Organics (DRO) (GC)

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6 as C6	ND		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C7 as C7	ND		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C8 as C8	ND		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C9-C10	ND		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C11-C12	ND		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C13-C14	ND		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C15-C16	21		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C17-C18	33		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C19-C20	50		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C21-C22	86		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C23-C24	140		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C25-C28	400		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C29-C32	420		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C33-C36	250		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C37-C40	98		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C41-C44	18		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
C6-C44	1500		12	9.2	mg/Kg	✱	09/14/21 12:44	09/16/21 09:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
n-Octacosane (Surr)	127		60 - 138				09/14/21 12:44	09/16/21 09:21	1

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6 as C6	ND		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C7 as C7	ND		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C8 as C8	ND		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C9-C10	ND		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C11-C12	ND		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C13-C14	13		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C15-C16	22		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C17-C18	22		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C19-C20	33		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C21-C22	79		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C23-C24	180		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C25-C28	580		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C29-C32	640		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C33-C36	350		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C37-C40	140		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C41-C44	28		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
C6-C44	2000		12	9.1	mg/Kg	✱	09/14/21 12:44	09/16/21 09:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
n-Octacosane (Surr)	135		60 - 138				09/14/21 12:44	09/16/21 09:44	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8015B - Diesel Range Organics (DRO) (GC)

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6 as C6	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C7 as C7	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C8 as C8	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C9-C10	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C11-C12	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C13-C14	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C15-C16	ND		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C17-C18	19		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C19-C20	33		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C21-C22	54		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C23-C24	92		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C25-C28	260		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C29-C32	270		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C33-C36	160		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C37-C40	59		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C41-C44	14		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
C6-C44	940		14	10	mg/Kg	✱	09/14/21 12:44	09/16/21 10:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
n-Octacosane (Surr)	127		60 - 138				09/14/21 12:44	09/16/21 10:07	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4'-DDD	3.4	J p	5.0	0.32	ug/Kg		09/17/21 20:21	09/23/21 19:19	5
2,4'-DDE	11	p	10	0.49	ug/Kg		09/17/21 20:21	09/23/21 19:19	5
2,4'-DDT	ND		5.0	0.46	ug/Kg		09/17/21 20:21	09/23/21 19:19	5
4,4'-DDD	18	F1	5.0	2.5	ug/Kg		09/17/21 20:21	09/23/21 19:19	5
4,4'-DDE	21		5.0	0.36	ug/Kg		09/17/21 20:21	09/23/21 19:19	5
4,4'-DDT	ND	F1 F2	5.0	0.89	ug/Kg		09/17/21 20:21	09/23/21 19:19	5
Chlordane	15	J	25	1.6	ug/Kg		09/17/21 20:21	09/23/21 19:19	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	25	p	20 - 131	09/17/21 20:21	09/23/21 19:19	5
DCB Decachlorobiphenyl (Surr)	96	p	20 - 180	09/17/21 20:21	09/23/21 19:19	5

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4'-DDD	2.5	J p	5.0	0.32	ug/Kg		09/17/21 20:21	09/23/21 19:34	5
2,4'-DDE	0.63	J p	10	0.48	ug/Kg		09/17/21 20:21	09/23/21 19:34	5
2,4'-DDT	ND		5.0	0.46	ug/Kg		09/17/21 20:21	09/23/21 19:34	5
4,4'-DDD	8.1	p	5.0	2.5	ug/Kg		09/17/21 20:21	09/23/21 19:34	5
4,4'-DDE	22		5.0	0.35	ug/Kg		09/17/21 20:21	09/23/21 19:34	5
4,4'-DDT	ND		5.0	0.88	ug/Kg		09/17/21 20:21	09/23/21 19:34	5
Chlordane	81		25	1.6	ug/Kg		09/17/21 20:21	09/23/21 19:34	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	50	p	20 - 131	09/17/21 20:21	09/23/21 19:34	5
DCB Decachlorobiphenyl (Surr)	98		20 - 180	09/17/21 20:21	09/23/21 19:34	5

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4'-DDD	1.3	J p	5.0	0.32	ug/Kg		09/17/21 20:23	09/23/21 19:48	5
2,4'-DDE	2.5	J p	10	0.48	ug/Kg		09/17/21 20:23	09/23/21 19:48	5
2,4'-DDT	ND		5.0	0.46	ug/Kg		09/17/21 20:23	09/23/21 19:48	5
4,4'-DDD	6.7	p	5.0	2.5	ug/Kg		09/17/21 20:23	09/23/21 19:48	5
4,4'-DDE	18		5.0	0.35	ug/Kg		09/17/21 20:23	09/23/21 19:48	5
4,4'-DDT	ND		5.0	0.88	ug/Kg		09/17/21 20:23	09/23/21 19:48	5
Chlordane	8.9	J p	25	1.6	ug/Kg		09/17/21 20:23	09/23/21 19:48	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	67	p	20 - 131	09/17/21 20:23	09/23/21 19:48	5
DCB Decachlorobiphenyl (Surr)	81	p	20 - 180	09/17/21 20:23	09/23/21 19:48	5

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4'-DDD	5.2	p	5.0	0.32	ug/Kg		09/17/21 20:23	09/23/21 20:02	5
2,4'-DDE	5.8	J p	9.9	0.48	ug/Kg		09/17/21 20:23	09/23/21 20:02	5
2,4'-DDT	ND		5.0	0.46	ug/Kg		09/17/21 20:23	09/23/21 20:02	5

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Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	23		5.0	2.5	ug/Kg		09/17/21 20:23	09/23/21 20:02	5
4,4'-DDE	17		5.0	0.35	ug/Kg		09/17/21 20:23	09/23/21 20:02	5
4,4'-DDT	ND		5.0	0.88	ug/Kg		09/17/21 20:23	09/23/21 20:02	5
Chlordane	27		25	1.6	ug/Kg		09/17/21 20:23	09/23/21 20:02	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	45	p	20 - 131				09/17/21 20:23	09/23/21 20:02	5
DCB Decachlorobiphenyl (Surr)	137		20 - 180				09/17/21 20:23	09/23/21 20:02	5

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4'-DDD	1.0	J p	5.0	0.32	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
2,4'-DDE	1.6	J p	9.9	0.48	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
2,4'-DDT	ND		5.0	0.46	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
4,4'-DDD	10	p	5.0	2.5	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
4,4'-DDE	8.1	p	5.0	0.35	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
4,4'-DDT	ND		5.0	0.88	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
Chlordane	12	J p	25	1.6	ug/Kg		09/17/21 20:23	09/23/21 20:16	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	40	p	20 - 131				09/17/21 20:23	09/23/21 20:16	5
DCB Decachlorobiphenyl (Surr)	112	p	20 - 180				09/17/21 20:23	09/23/21 20:16	5

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND	F2 F1	29	16	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1
Aroclor-1221	ND		29	16	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1
Aroclor-1232	ND		29	16	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1
Aroclor-1242	ND		29	16	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1
Aroclor-1248	ND		29	16	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1
Aroclor-1254	180		29	14	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1
Aroclor-1260	180	F1	29	14	ug/Kg	☆	09/17/21 20:21	09/23/21 18:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	44		20 - 155	09/17/21 20:21	09/23/21 18:29	1
Tetrachloro-m-xylene (Surr)	45		25 - 126	09/17/21 20:21	09/23/21 18:29	1

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		20	11	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1
Aroclor-1221	ND		20	11	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1
Aroclor-1232	ND		20	11	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1
Aroclor-1242	ND		20	11	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1
Aroclor-1248	ND		20	11	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1
Aroclor-1254	89		20	9.9	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1
Aroclor-1260	110		20	9.9	ug/Kg	☆	09/17/21 20:21	09/23/21 18:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	78		20 - 155	09/17/21 20:21	09/23/21 18:47	1
Tetrachloro-m-xylene (Surr)	65		25 - 126	09/17/21 20:21	09/23/21 18:47	1

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1
Aroclor-1221	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1
Aroclor-1232	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1
Aroclor-1242	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1
Aroclor-1248	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1
Aroclor-1254	130		24	12	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1
Aroclor-1260	110		24	12	ug/Kg	☆	09/17/21 20:23	09/23/21 19:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	76		20 - 155	09/17/21 20:23	09/23/21 19:05	1
Tetrachloro-m-xylene (Surr)	64		25 - 126	09/17/21 20:23	09/23/21 19:05	1

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1
Aroclor-1221	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1
Aroclor-1232	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1

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Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1242	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1
Aroclor-1248	ND		24	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1
Aroclor-1254	100		24	12	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1
Aroclor-1260	98		24	12	ug/Kg	☆	09/17/21 20:23	09/23/21 19:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	75		20 - 155				09/17/21 20:23	09/23/21 19:23	1
Tetrachloro-m-xylene (Surr)	63		25 - 126				09/17/21 20:23	09/23/21 19:23	1

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		27	15	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Aroclor-1221	ND		27	15	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Aroclor-1232	ND		27	15	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Aroclor-1242	ND		27	15	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Aroclor-1248	ND		27	15	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Aroclor-1254	110		27	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Aroclor-1260	190		27	13	ug/Kg	☆	09/17/21 20:23	09/23/21 19:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	71		20 - 155				09/17/21 20:23	09/23/21 19:41	1
Tetrachloro-m-xylene (Surr)	52		25 - 126				09/17/21 20:23	09/23/21 19:41	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		2.82	1.27	mg/Kg	☆	09/23/21 08:25	09/23/21 13:56	20
Chromium	54.1		5.63	0.845	mg/Kg	☆	09/23/21 08:25	09/23/21 13:56	20
Copper	134	F1	2.82	0.758	mg/Kg	☆	09/23/21 08:25	09/23/21 13:56	20
Lead	76.8	F1	2.82	0.605	mg/Kg	☆	09/23/21 08:25	09/23/21 13:56	20
Nickel	19.0		2.82	0.760	mg/Kg	☆	09/23/21 08:25	09/23/21 13:56	20
Zinc	565		14.1	13.0	mg/Kg	☆	09/23/21 08:25	09/23/21 13:56	20

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		2.00	0.900	mg/Kg	☆	09/23/21 08:25	09/23/21 14:18	20
Chromium	37.9		4.00	0.600	mg/Kg	☆	09/23/21 08:25	09/23/21 14:18	20
Copper	93.5		2.00	0.538	mg/Kg	☆	09/23/21 08:25	09/23/21 14:18	20
Lead	57.6		2.00	0.430	mg/Kg	☆	09/23/21 08:25	09/23/21 14:18	20
Nickel	13.3		2.00	0.540	mg/Kg	☆	09/23/21 08:25	09/23/21 14:18	20
Zinc	353		10.0	9.24	mg/Kg	☆	09/23/21 08:25	09/23/21 14:18	20

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		2.31	1.04	mg/Kg	☆	09/23/21 08:25	09/23/21 14:21	20
Chromium	40.3		4.63	0.694	mg/Kg	☆	09/23/21 08:25	09/23/21 14:21	20
Copper	95.9		2.31	0.623	mg/Kg	☆	09/23/21 08:25	09/23/21 14:21	20
Lead	57.8		2.31	0.498	mg/Kg	☆	09/23/21 08:25	09/23/21 14:21	20
Nickel	14.0		2.31	0.625	mg/Kg	☆	09/23/21 08:25	09/23/21 14:21	20
Zinc	386		11.6	10.7	mg/Kg	☆	09/23/21 08:25	09/23/21 14:21	20

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		2.37	1.07	mg/Kg	☆	09/23/21 08:25	09/23/21 14:24	20
Chromium	44.3		4.75	0.712	mg/Kg	☆	09/23/21 08:25	09/23/21 14:24	20
Copper	111		2.37	0.639	mg/Kg	☆	09/23/21 08:25	09/23/21 14:24	20
Lead	65.3		2.37	0.510	mg/Kg	☆	09/23/21 08:25	09/23/21 14:24	20
Nickel	14.0		2.37	0.641	mg/Kg	☆	09/23/21 08:25	09/23/21 14:24	20
Zinc	386		11.9	11.0	mg/Kg	☆	09/23/21 08:25	09/23/21 14:24	20

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		2.73	1.23	mg/Kg	☆	09/23/21 08:25	09/23/21 14:28	20
Chromium	42.6		5.45	0.818	mg/Kg	☆	09/23/21 08:25	09/23/21 14:28	20
Copper	92.7		2.73	0.733	mg/Kg	☆	09/23/21 08:25	09/23/21 14:28	20
Lead	55.4		2.73	0.586	mg/Kg	☆	09/23/21 08:25	09/23/21 14:28	20
Nickel	13.4		2.73	0.736	mg/Kg	☆	09/23/21 08:25	09/23/21 14:28	20
Zinc	328		13.6	12.6	mg/Kg	☆	09/23/21 08:25	09/23/21 14:28	20

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Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 7471A - Mercury (CVAA)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.222	J	0.234	0.0380	mg/Kg	☆	09/23/21 09:54	09/23/21 14:29	1

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.246		0.158	0.0256	mg/Kg	☆	09/23/21 09:54	09/23/21 14:34	1

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.334		0.208	0.0337	mg/Kg	☆	09/23/21 09:54	09/23/21 14:36	1

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.359		0.195	0.0315	mg/Kg	☆	09/23/21 09:54	09/23/21 14:38	1

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.206	J	0.224	0.0362	mg/Kg	☆	09/23/21 09:54	09/23/21 14:40	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

General Chemistry

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	49900		1430	496	mg/Kg	☼		09/15/21 10:51	1
Percent Moisture	65.0		0.1	0.1	%			09/14/21 16:15	1

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	38800		995	346	mg/Kg	☼		09/16/21 10:51	1
Percent Moisture	49.8		0.1	0.1	%			09/14/21 16:15	1

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	44200		1190	412	mg/Kg	☼		09/16/21 10:51	1
Percent Moisture	57.8		0.1	0.1	%			09/14/21 16:15	1

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	41500		1190	412	mg/Kg	☼		09/15/21 10:32	1
Percent Moisture	57.9		0.1	0.1	%			09/14/21 16:15	1

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	33700		1340	466	mg/Kg	☼		09/15/21 10:32	1
Percent Moisture	62.7		0.1	0.1	%			09/14/21 16:15	1

Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering)

Client Sample ID: SED-003
Date Collected: 09/09/21 17:55
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay (less than 0.00391 mm)	12.49		0.01	0.01	%			09/23/21 15:57	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			09/23/21 15:57	1
Fine Sand (0.125 to 0.25mm)	1.05		0.01	0.01	%			09/23/21 15:57	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			09/23/21 15:57	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			09/23/21 15:57	1
Silt (0.00391 to 0.0625mm)	69.38		0.01	0.01	%			09/23/21 15:57	1
Total Silt and Clay (0 to 0.0626mm)	81.87		0.01	0.01	%			09/23/21 15:57	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			09/23/21 15:57	1
Very Fine Sand (0.0625 to 0.125 mm)	17.08		0.01	0.01	%			09/23/21 15:57	1

Client Sample ID: SED-004
Date Collected: 09/09/21 13:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay (less than 0.00391 mm)	11.66		0.01	0.01	%			09/23/21 16:03	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			09/23/21 16:03	1
Fine Sand (0.125 to 0.25mm)	0.76		0.01	0.01	%			09/23/21 16:03	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			09/23/21 16:03	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			09/23/21 16:03	1
Silt (0.00391 to 0.0625mm)	68.33		0.01	0.01	%			09/23/21 16:03	1
Total Silt and Clay (0 to 0.0626mm)	79.99		0.01	0.01	%			09/23/21 16:03	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			09/23/21 16:03	1
Very Fine Sand (0.0625 to 0.125 mm)	19.25		0.01	0.01	%			09/23/21 16:03	1

Client Sample ID: SED-005
Date Collected: 09/09/21 15:45
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-3
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay (less than 0.00391 mm)	13.54		0.01	0.01	%			09/23/21 16:09	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			09/23/21 16:09	1
Fine Sand (0.125 to 0.25mm)	0.71		0.01	0.01	%			09/23/21 16:09	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			09/23/21 16:09	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			09/23/21 16:09	1
Silt (0.00391 to 0.0625mm)	70.10		0.01	0.01	%			09/23/21 16:09	1
Total Silt and Clay (0 to 0.0626mm)	83.64		0.01	0.01	%			09/23/21 16:09	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			09/23/21 16:09	1
Very Fine Sand (0.0625 to 0.125 mm)	15.64		0.01	0.01	%			09/23/21 16:09	1

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay (less than 0.00391 mm)	7.33		0.01	0.01	%			09/23/21 16:15	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			09/23/21 16:15	1
Fine Sand (0.125 to 0.25mm)	2.32		0.01	0.01	%			09/23/21 16:15	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			09/23/21 16:15	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			09/23/21 16:15	1
Silt (0.00391 to 0.0625mm)	68.44		0.01	0.01	%			09/23/21 16:15	1

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Client Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: D4464 - Particle Size Distribution of Catalytic Material (Laser light scattering) (Continued)

Client Sample ID: SED-006
Date Collected: 09/09/21 10:25
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Silt and Clay (0 to 0.0626mm)	75.76		0.01	0.01	%			09/23/21 16:15	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			09/23/21 16:15	1
Very Fine Sand (0.0625 to 0.125 mm)	21.91		0.01	0.01	%			09/23/21 16:15	1

Client Sample ID: SED-007
Date Collected: 09/09/21 11:30
Date Received: 09/13/21 13:50

Lab Sample ID: 570-69878-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay (less than 0.00391 mm)	6.40		0.01	0.01	%			09/23/21 16:24	1
Coarse Sand (0.5mm to 1mm)	ND		0.01	0.01	%			09/23/21 16:24	1
Fine Sand (0.125 to 0.25mm)	3.01		0.01	0.01	%			09/23/21 16:24	1
Gravel (greater than 2 mm)	ND		0.01	0.01	%			09/23/21 16:24	1
Medium Sand (0.25 to 0.5 mm)	ND		0.01	0.01	%			09/23/21 16:24	1
Silt (0.00391 to 0.0625mm)	67.41		0.01	0.01	%			09/23/21 16:24	1
Total Silt and Clay (0 to 0.0626mm)	73.80		0.01	0.01	%			09/23/21 16:24	1
Very Coarse Sand (1 to 2mm)	ND		0.01	0.01	%			09/23/21 16:24	1
Very Fine Sand (0.0625 to 0.125 mm)	23.19		0.01	0.01	%			09/23/21 16:24	1

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

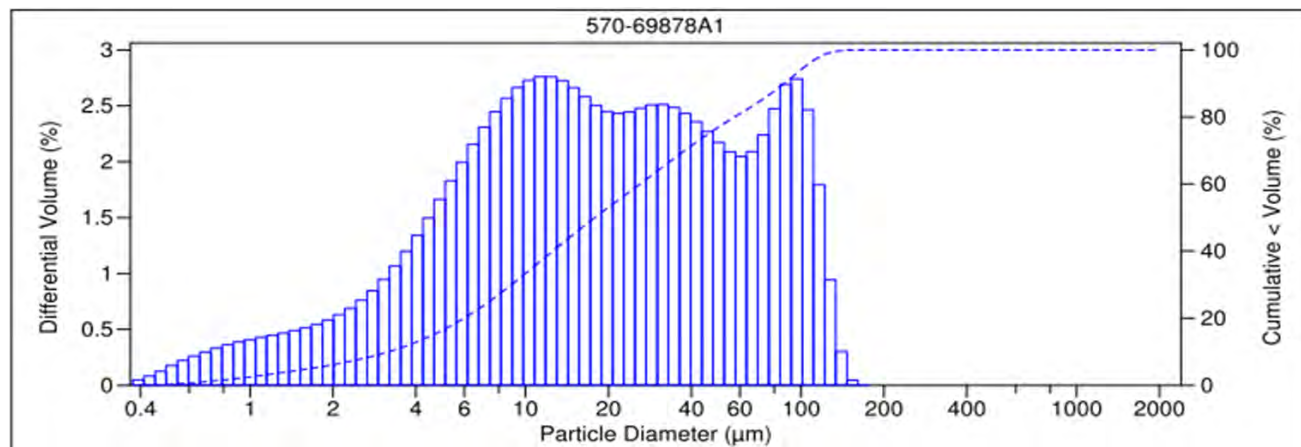
Tesoro Los Angeles Refinery - Carson Operations

Date Sampled: 09/09/21
Date Received: 09/13/21
Work Order No: 570-69878
Date Analyzed: 09/23/21
Method: ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
SED-003		Silt	0.032

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	1.05	17.08	69.38	12.49	81.87



V 3.0

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

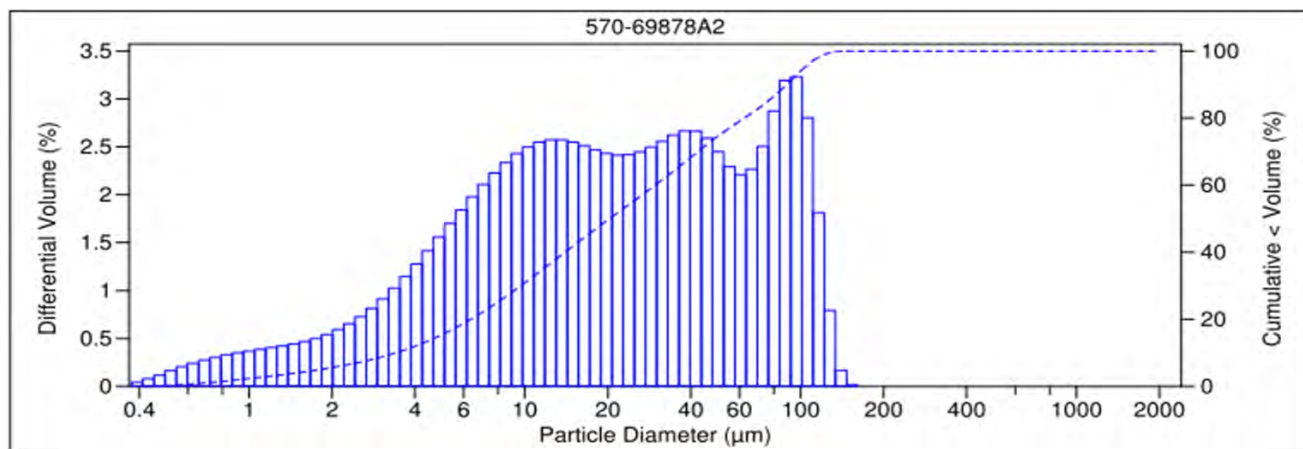
Tesoro Los Angeles Refinery - Carson Operations

Date Sampled: 09/09/21
Date Received: 09/13/21
Work Order No: 570-69878
Date Analyzed: 09/23/21
Method: ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
SED-004		Silt	0.034

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	0.76	19.25	68.33	11.66	79.99



V 3.0

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

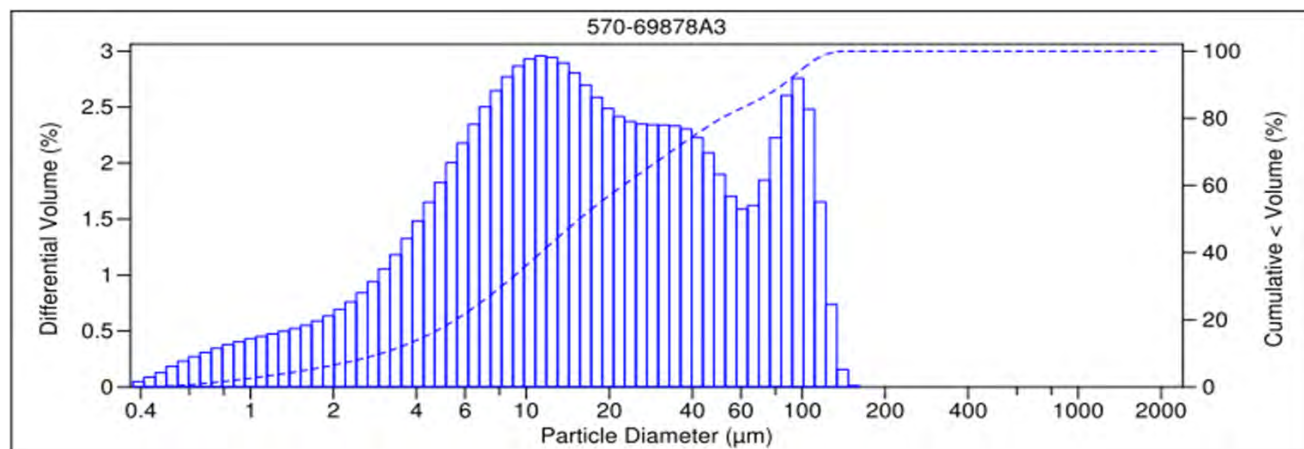
Tesoro Los Angeles Refinery - Carson Operations

Date Sampled: 09/09/21
 Date Received: 09/13/21
 Work Order No: 570-69878
 Date Analyzed: 09/23/21
 Method: ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
SED-005		Silt	0.029

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	0.71	15.64	70.10	13.54	83.64



V 3.0

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

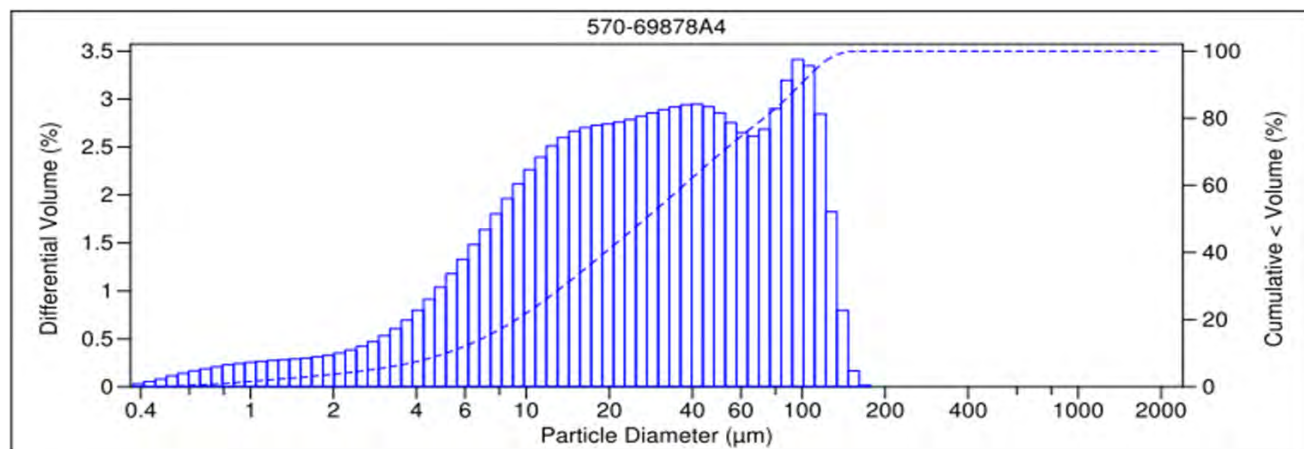
Tesoro Los Angeles Refinery - Carson Operations

Date Sampled: 09/09/21
Date Received: 09/13/21
Work Order No: 570-69878
Date Analyzed: 09/23/21
Method: ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
SED-006		Silt	0.040

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	2.32	21.91	68.44	7.33	75.76



V 3.0

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

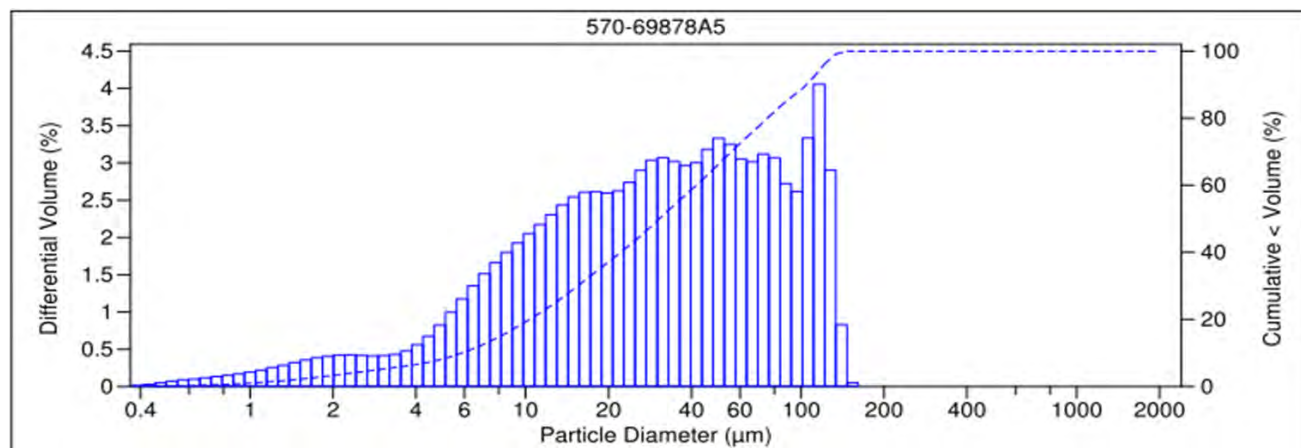
Tesoro Los Angeles Refinery - Carson Operations

Date Sampled: 09/09/21
 Date Received: 09/13/21
 Work Order No: 570-69878
 Date Analyzed: 09/23/21
 Method: ASTM D4464M

Project:

Sample ID	Depth ft	Description	Mean Grain Size mm
SED-007		Silt	0.043

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	3.01	23.19	67.41	6.40	73.80



V 3.0

Surrogate Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		FBP (22-130)	NBZ (20-145)	TPHd14 (33-147)
570-69878-1	SED-003	70	44	90
570-69878-1 MS	SED-003	73	45	92
570-69878-1 MSD	SED-003	73	45	90
570-69878-2	SED-004	61	36	81
570-69878-3	SED-005	72	45	91
570-69878-4	SED-006	56	34	80
570-69878-5	SED-007	71	54	103
LCS 570-180052/2-A	Lab Control Sample	72	62	83
LCSD 570-180052/3-A	Lab Control Sample Dup	77	60	90
MB 570-180052/1-A	Method Blank	77	67	87

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)

Method: Organotins SIM - Organotins (GC/MS SIM)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		TPTT (10-120)	
570-69878-1	SED-003	80	
570-69878-2	SED-004	104	
570-69878-3	SED-005	91	
570-69878-4	SED-006	90	
570-69878-5	SED-007	95	
LCS 570-179948/2-A	Lab Control Sample	105	
LCSD 570-179948/3-A	Lab Control Sample Dup	119	
MB 570-179948/1-A	Method Blank	109	

Surrogate Legend

TPTT = Triphenyltin

Method: 8015B - Diesel Range Organics (DRO) (GC)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		OTCSN1 (60-138)	
570-69878-1	SED-003	122	
570-69878-2	SED-004	127	
570-69878-3	SED-005	127	
570-69878-4	SED-006	135	
570-69878-5	SED-007	127	
LCS 570-179051/2-A	Lab Control Sample	105	
LCSD 570-179051/3-A	Lab Control Sample Dup	103	
MB 570-179051/1-A	Method Blank	115	

Surrogate Legend

OTCSN = n-Octacosane (Surr)

Surrogate Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8081A - Organochlorine Pesticides (GC)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCX1 (20-131)	DCB1 (20-180)
570-69878-1	SED-003	25 p	96 p
570-69878-1 MS	SED-003	72 p	138
570-69878-1 MSD	SED-003	84 p	143 p
570-69878-2	SED-004	50 p	98
570-69878-3	SED-005	67 p	81 p
570-69878-4	SED-006	45 p	137
570-69878-5	SED-007	40 p	112 p
LCS 570-180082/2-A	Lab Control Sample	99	122
LCSD 570-180082/3-A	Lab Control Sample Dup	92	103
MB 570-180082/1-A	Method Blank	87	97

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCB = DCB Decachlorobiphenyl (Surr)

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCB1 (20-155)	TCX1 (25-126)
570-69878-1	SED-003	44	45
570-69878-1 MS	SED-003	61	55
570-69878-1 MSD	SED-003	80	68
570-69878-2	SED-004	78	65
570-69878-3	SED-005	76	64
570-69878-4	SED-006	75	63
570-69878-5	SED-007	71	52
LCS 570-180082/6-A	Lab Control Sample	71	74
LCSD 570-180082/7-A	Lab Control Sample Dup	76	82
MB 570-180082/1-A	Method Blank	89	77

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

TCX = Tetrachloro-m-xylene (Surr)

QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM)

Lab Sample ID: MB 570-180052/1-A

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 180052

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.010	0.00051	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Acenaphthylene	ND		0.010	0.0085	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Anthracene	ND		0.010	0.00067	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
1,2-Benzanthracene	ND		0.010	0.0011	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Benzo[a]pyrene	ND		0.010	0.0014	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
3,4-Benzofluoranthene	ND		0.010	0.0015	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Benzo[k]fluoranthene	ND		0.010	0.0016	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
1,12-Benzoperylene	ND		0.010	0.0015	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Chrysene	ND		0.010	0.00078	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Dibenz(a,h)anthracene	ND		0.010	0.0011	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Fluoranthene	ND		0.010	0.00097	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Fluorene	ND		0.010	0.00084	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Indeno[1,2,3-cd]pyrene	ND		0.010	0.0012	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
1-Methylnaphthalene	ND		0.010	0.00072	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
2-Methylnaphthalene	ND		0.010	0.00072	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Naphthalene	ND		0.010	0.00078	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Phenanthrene	ND		0.010	0.00084	mg/Kg		09/17/21 18:49	09/20/21 18:55	1
Pyrene	ND		0.010	0.00075	mg/Kg		09/17/21 18:49	09/20/21 18:55	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	77		22 - 130	09/17/21 18:49	09/20/21 18:55	1
Nitrobenzene-d5 (Surr)	67		20 - 145	09/17/21 18:49	09/20/21 18:55	1
p-Terphenyl-d14 (Surr)	87		33 - 147	09/17/21 18:49	09/20/21 18:55	1

Lab Sample ID: LCS 570-180052/2-A

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 180052

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	0.100	0.07117		mg/Kg		71	53 - 125
Acenaphthylene	0.100	0.08591		mg/Kg		86	50 - 123
Anthracene	0.100	0.07390		mg/Kg		74	50 - 132
1,2-Benzanthracene	0.100	0.07596		mg/Kg		76	50 - 133
Benzo[a]pyrene	0.100	0.08633		mg/Kg		86	50 - 134
3,4-Benzofluoranthene	0.100	0.07453		mg/Kg		75	50 - 142
Benzo[k]fluoranthene	0.100	0.07610		mg/Kg		76	49 - 150
1,12-Benzoperylene	0.100	0.07944		mg/Kg		79	50 - 130
Chrysene	0.100	0.07675		mg/Kg		77	51 - 129
Dibenz(a,h)anthracene	0.100	0.07928		mg/Kg		79	50 - 133
Fluoranthene	0.100	0.07546		mg/Kg		75	55 - 127
Fluorene	0.100	0.07324		mg/Kg		73	55 - 127
Indeno[1,2,3-cd]pyrene	0.100	0.07856		mg/Kg		79	50 - 148
1-Methylnaphthalene	0.100	0.07373		mg/Kg		74	54 - 132
2-Methylnaphthalene	0.100	0.07177		mg/Kg		72	50 - 127
Naphthalene	0.100	0.06807		mg/Kg		68	51 - 129
Phenanthrene	0.100	0.07125		mg/Kg		71	50 - 122
Pyrene	0.100	0.07863		mg/Kg		79	50 - 134

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM) (Continued)

Lab Sample ID: LCS 570-180052/2-A

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 180052

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
2-Fluorobiphenyl (Surr)	72		22 - 130
Nitrobenzene-d5 (Surr)	62		20 - 145
p-Terphenyl-d14 (Surr)	83		33 - 147

Lab Sample ID: LCSD 570-180052/3-A

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 180052

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	0.100	0.08008		mg/Kg		80	53 - 125	12	20
Acenaphthylene	0.100	0.09620		mg/Kg		96	50 - 123	11	20
Anthracene	0.100	0.08318		mg/Kg		83	50 - 132	12	20
1,2-Benzanthracene	0.100	0.08467		mg/Kg		85	50 - 133	11	20
Benzo[a]pyrene	0.100	0.09753		mg/Kg		98	50 - 134	12	20
3,4-Benzofluoranthene	0.100	0.08334		mg/Kg		83	50 - 142	11	20
Benzo[k]fluoranthene	0.100	0.08595		mg/Kg		86	49 - 150	12	20
1,12-Benzoperylene	0.100	0.08878		mg/Kg		89	50 - 130	11	20
Chrysene	0.100	0.08710		mg/Kg		87	51 - 129	13	20
Dibenz(a,h)anthracene	0.100	0.08909		mg/Kg		89	50 - 133	12	20
Fluoranthene	0.100	0.08398		mg/Kg		84	55 - 127	11	20
Fluorene	0.100	0.08231		mg/Kg		82	55 - 127	12	20
Indeno[1,2,3-cd]pyrene	0.100	0.08719		mg/Kg		87	50 - 148	10	20
1-Methylnaphthalene	0.100	0.08322		mg/Kg		83	54 - 132	12	20
2-Methylnaphthalene	0.100	0.08157		mg/Kg		82	50 - 127	13	20
Naphthalene	0.100	0.07793		mg/Kg		78	51 - 129	13	20
Phenanthrene	0.100	0.08180		mg/Kg		82	50 - 122	14	20
Pyrene	0.100	0.08793		mg/Kg		88	50 - 134	11	20

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
2-Fluorobiphenyl (Surr)	77		22 - 130
Nitrobenzene-d5 (Surr)	60		20 - 145
p-Terphenyl-d14 (Surr)	90		33 - 147

Lab Sample ID: 570-69878-1 MS

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180052

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	0.046	J	0.284	0.3516		mg/Kg	✱	108	29 - 137
Acenaphthylene	ND		0.284	0.2935		mg/Kg	✱	104	29 - 131
Anthracene	0.10		0.284	0.4328		mg/Kg	✱	117	26 - 134
1,2-Benzanthracene	0.28		0.284	0.8920	F1	mg/Kg	✱	214	24 - 150
Benzo[a]pyrene	0.45		0.284	1.150	F1	mg/Kg	✱	249	29 - 149
3,4-Benzofluoranthene	0.43		0.284	0.9273	F1	mg/Kg	✱	174	21 - 153
Benzo[k]fluoranthene	0.40		0.284	1.045	F1	mg/Kg	✱	229	28 - 148
1,12-Benzoperylene	0.35		0.284	0.7763	F1	mg/Kg	✱	149	20 - 148
Chrysene	0.55		0.284	1.368	F1	mg/Kg	✱	288	25 - 145
Dibenz(a,h)anthracene	0.13		0.284	0.4690		mg/Kg	✱	121	20 - 132

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8270C SIM - PAHs (GC/MS SIM) (Continued)

Lab Sample ID: 570-69878-1 MS

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180052

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoranthene	0.84		0.284	2.222	F1	mg/Kg	✱	487	20 - 151
Fluorene	0.065		0.284	0.3550		mg/Kg	✱	102	36 - 132
Indeno[1,2,3-cd]pyrene	0.21		0.284	0.5954		mg/Kg	✱	137	20 - 154
1-Methylnaphthalene	0.014	J	0.284	0.2176		mg/Kg	✱	72	34 - 136
2-Methylnaphthalene	0.035	J	0.284	0.2326		mg/Kg	✱	70	29 - 137
Naphthalene	0.030	J	0.284	0.1957		mg/Kg	✱	59	20 - 150
Phenanthrene	0.40		0.284	1.498	F1	mg/Kg	✱	387	20 - 144
Pyrene	0.92		0.284	1.905	F1	mg/Kg	✱	348	20 - 150

Surrogate	MS %Recovery	MS Qualifier	Limits
2-Fluorobiphenyl (Surr)	73		22 - 130
Nitrobenzene-d5 (Surr)	45		20 - 145
p-Terphenyl-d14 (Surr)	92		33 - 147

Lab Sample ID: 570-69878-1 MSD

Matrix: Solid

Analysis Batch: 180477

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180052

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	0.046	J	0.283	0.3174		mg/Kg	✱	96	29 - 137	10	28
Acenaphthylene	ND		0.283	0.2985		mg/Kg	✱	105	29 - 131	2	32
Anthracene	0.10		0.283	0.3737		mg/Kg	✱	97	26 - 134	15	27
1,2-Benzanthracene	0.28		0.283	0.5984	F2	mg/Kg	✱	111	24 - 150	39	24
Benzo[a]pyrene	0.45		0.283	0.8991	F1 F2	mg/Kg	✱	160	29 - 149	25	22
3,4-Benzofluoranthene	0.43		0.283	0.5702	F2	mg/Kg	✱	48	21 - 153	48	26
Benzo[k]fluoranthene	0.40		0.283	0.8586	F1	mg/Kg	✱	163	28 - 148	20	26
1,12-Benzoperylene	0.35		0.283	0.6666		mg/Kg	✱	110	20 - 148	15	27
Chrysene	0.55		0.283	0.8392	F2	mg/Kg	✱	102	25 - 145	48	28
Dibenz(a,h)anthracene	0.13		0.283	0.3852		mg/Kg	✱	92	20 - 132	20	26
Fluoranthene	0.84		0.283	1.267	F2	mg/Kg	✱	151	20 - 151	55	26
Fluorene	0.065		0.283	0.3132		mg/Kg	✱	88	36 - 132	13	27
Indeno[1,2,3-cd]pyrene	0.21		0.283	0.5009		mg/Kg	✱	104	20 - 154	17	25
1-Methylnaphthalene	0.014	J	0.283	0.2521		mg/Kg	✱	84	34 - 136	15	29
2-Methylnaphthalene	0.035	J	0.283	0.2765		mg/Kg	✱	85	29 - 137	17	31
Naphthalene	0.030	J	0.283	0.2593		mg/Kg	✱	81	20 - 150	28	33
Phenanthrene	0.40		0.283	0.7782	F2	mg/Kg	✱	133	20 - 144	63	27
Pyrene	0.92		0.283	1.265	F2	mg/Kg	✱	123	20 - 150	40	32

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2-Fluorobiphenyl (Surr)	73		22 - 130
Nitrobenzene-d5 (Surr)	45		20 - 145
p-Terphenyl-d14 (Surr)	90		33 - 147

QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: Organotins SIM - Organotins (GC/MS SIM)

Lab Sample ID: MB 570-179948/1-A

Matrix: Solid

Analysis Batch: 181787

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 179948

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		3.0	1.5	ug/Kg		09/17/21 12:08	09/24/21 20:50	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	109		10 - 120				09/17/21 12:08	09/24/21 20:50	1

Lab Sample ID: LCS 570-179948/2-A

Matrix: Solid

Analysis Batch: 181787

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 179948

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Tetrabutyltin	100	89.50		ug/Kg		89	10 - 153
Tributyltin	100	67.87		ug/Kg		68	10 - 126
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
Tripentyltin	105		10 - 120				

Lab Sample ID: LCSD 570-179948/3-A

Matrix: Solid

Analysis Batch: 181787

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 179948

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Tetrabutyltin	100	109.9		ug/Kg		110	10 - 153	20	30
Tributyltin	100	75.63		ug/Kg		76	10 - 126	11	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
Tripentyltin	119		10 - 120						

Method: 8015B - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 570-179051/1-A

Matrix: Solid

Analysis Batch: 179416

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 179051

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C6 as C6	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C7 as C7	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C8 as C8	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C9-C10	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C11-C12	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C13-C14	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C15-C16	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C17-C18	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C19-C20	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C21-C22	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C23-C24	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C25-C28	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C29-C32	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C33-C36	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8015B - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: MB 570-179051/1-A

Matrix: Solid

Analysis Batch: 179416

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 179051

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C37-C40	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C41-C44	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
C6-C44	ND		5.0	3.8	mg/Kg		09/14/21 12:43	09/16/21 14:32	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
n-Octacosane (Surr)	115		60 - 138				09/14/21 12:43	09/16/21 14:32	1

Lab Sample ID: LCS 570-179051/2-A

Matrix: Solid

Analysis Batch: 179136

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 179051

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics [C10-C28]	400	451.9		mg/Kg		113	80 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
n-Octacosane (Surr)	105		60 - 138				

Lab Sample ID: LCSD 570-179051/3-A

Matrix: Solid

Analysis Batch: 179136

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 179051

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Diesel Range Organics [C10-C28]	400	464.0		mg/Kg		116	80 - 130	3	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
n-Octacosane (Surr)	103		60 - 138						

Method: 8081A - Organochlorine Pesticides (GC)

Lab Sample ID: MB 570-180082/1-A

Matrix: Solid

Analysis Batch: 181420

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 180082

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4'-DDD	ND		1.0	0.064	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
2,4'-DDE	ND		2.0	0.097	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
2,4'-DDT	ND		1.0	0.092	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
4,4'-DDD	ND		1.0	0.50	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
4,4'-DDE	ND		1.0	0.071	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
4,4'-DDT	ND		1.0	0.18	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
Chlordane	ND		5.0	0.33	ug/Kg		09/17/21 20:21	09/23/21 18:22	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	87		20 - 131				09/17/21 20:21	09/23/21 18:22	1
DCB Decachlorobiphenyl (Surr)	97		20 - 180				09/17/21 20:21	09/23/21 18:22	1

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 570-180082/2-A

Matrix: Solid

Analysis Batch: 181420

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	5.00	6.038		ug/Kg		121	54 - 150
4,4'-DDE	5.00	5.737		ug/Kg		115	49 - 146
4,4'-DDT	5.00	5.986		ug/Kg		120	52 - 147

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	99		20 - 131
DCB Decachlorobiphenyl (Surr)	122		20 - 180

Lab Sample ID: LCSD 570-180082/3-A

Matrix: Solid

Analysis Batch: 181420

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
4,4'-DDD	5.00	5.165		ug/Kg		103	54 - 150	16	29
4,4'-DDE	5.00	4.953		ug/Kg		99	49 - 146	15	28
4,4'-DDT	5.00	5.132		ug/Kg		103	52 - 147	15	32

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene	92		20 - 131
DCB Decachlorobiphenyl (Surr)	103		20 - 180

Lab Sample ID: 570-69878-1 MS

Matrix: Solid

Analysis Batch: 181420

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	18	F1	5.01	29.98	F1	ug/Kg		239	17 - 180
4,4'-DDE	21		5.01	36.19	4	ug/Kg		310	20 - 180
4,4'-DDT	ND	F1 F2	5.01	10.17	F1 p	ug/Kg		203	10 - 180

Surrogate	MS %Recovery	MS Qualifier	Limits
Tetrachloro-m-xylene	72	p	20 - 131
DCB Decachlorobiphenyl (Surr)	138		20 - 180

Lab Sample ID: 570-69878-1 MSD

Matrix: Solid

Analysis Batch: 181420

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
4,4'-DDD	18	F1	5.01	26.62		ug/Kg		172	17 - 180	12	40
4,4'-DDE	21		5.01	28.85	4	ug/Kg		163	20 - 180	23	40
4,4'-DDT	ND	F1 F2	5.01	1.779	J p F2	ug/Kg		36	10 - 180	140	40

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Tetrachloro-m-xylene	84	p	20 - 131
DCB Decachlorobiphenyl (Surr)	143	p	20 - 180

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 570-180082/1-A

Matrix: Solid

Analysis Batch: 181261

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 180082

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		10	5.5	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Aroclor-1221	ND		10	5.5	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Aroclor-1232	ND		10	5.5	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Aroclor-1242	ND		10	5.5	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Aroclor-1248	ND		10	5.5	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Aroclor-1254	ND		10	5.0	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Aroclor-1260	ND		10	5.0	ug/Kg		09/17/21 20:21	09/23/21 18:11	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	89		20 - 155				09/17/21 20:21	09/23/21 18:11	1
Tetrachloro-m-xylene (Surr)	77		25 - 126				09/17/21 20:21	09/23/21 18:11	1

Lab Sample ID: LCS 570-180082/6-A

Matrix: Solid

Analysis Batch: 181261

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aroclor-1016	20.0	21.89		ug/Kg		109	50 - 142
Aroclor-1260	20.0	21.28		ug/Kg		106	50 - 150
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
DCB Decachlorobiphenyl (Surr)	71		20 - 155				
Tetrachloro-m-xylene (Surr)	74		25 - 126				

Lab Sample ID: LCSD 570-180082/7-A

Matrix: Solid

Analysis Batch: 181261

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aroclor-1016	20.0	23.10		ug/Kg		116	50 - 142	5	30
Aroclor-1260	20.0	22.64		ug/Kg		113	50 - 150	6	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
DCB Decachlorobiphenyl (Surr)	76		20 - 155						
Tetrachloro-m-xylene (Surr)	82		25 - 126						

Lab Sample ID: 570-69878-1 MS

Matrix: Solid

Analysis Batch: 181261

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aroclor-1016	ND	F2 F1	57.3	246.0	F1	ug/Kg	☼	430	20 - 175
Aroclor-1260	180	F1	57.3	411.8	F1	ug/Kg	☼	409	20 - 180
Surrogate	MS %Recovery	MS Qualifier	Limits						
DCB Decachlorobiphenyl (Surr)	61		20 - 155						
Tetrachloro-m-xylene (Surr)	55		25 - 126						

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: 570-69878-1 MSD

Matrix: Solid

Analysis Batch: 181261

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 180082

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aroclor-1016	ND	F2 F1	57.3	452.3	F1 F2	ug/Kg	✱	789	20 - 175	59	40
Aroclor-1260	180	F1	57.3	281.7	F1	ug/Kg	✱	181	20 - 180	38	40
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
DCB Decachlorobiphenyl (Surr)	80		20 - 155								
Tetrachloro-m-xylene (Surr)	68		25 - 126								

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 570-181268/1-A ^20

Matrix: Solid

Analysis Batch: 181377

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 181268

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.00	0.450	mg/Kg		09/23/21 08:25	09/23/21 13:43	20
Chromium	ND		2.00	0.300	mg/Kg		09/23/21 08:25	09/23/21 13:43	20
Copper	ND		1.00	0.269	mg/Kg		09/23/21 08:25	09/23/21 13:43	20
Lead	ND		1.00	0.215	mg/Kg		09/23/21 08:25	09/23/21 13:43	20
Nickel	ND		1.00	0.270	mg/Kg		09/23/21 08:25	09/23/21 13:43	20
Zinc	ND		5.00	4.62	mg/Kg		09/23/21 08:25	09/23/21 13:43	20

Lab Sample ID: LCS 570-181268/2-A ^20

Matrix: Solid

Analysis Batch: 181377

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 181268

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits			
Cadmium	25.8	26.28		mg/Kg		102	80 - 120			
Chromium	25.8	24.41		mg/Kg		95	80 - 120			
Copper	25.8	25.44		mg/Kg		99	80 - 120			
Lead	25.8	25.08		mg/Kg		97	80 - 120			
Nickel	25.8	25.86		mg/Kg		100	80 - 120			
Zinc	25.8	27.08		mg/Kg		105	80 - 120			

Lab Sample ID: LCSD 570-181268/3-A ^20

Matrix: Solid

Analysis Batch: 181377

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 181268

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	25.1	25.61		mg/Kg		102	80 - 120	3	20
Chromium	25.1	24.35		mg/Kg		97	80 - 120	0	20
Copper	25.1	24.91		mg/Kg		99	80 - 120	2	20
Lead	25.1	24.64		mg/Kg		98	80 - 120	2	20
Nickel	25.1	26.27		mg/Kg		105	80 - 120	2	20
Zinc	25.1	26.05		mg/Kg		104	80 - 120	4	20

QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: 570-69878-1 MS

Matrix: Solid

Analysis Batch: 181377

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 181268

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	ND		69.0	73.75		mg/Kg	✱	107	85 - 121
Chromium	54.1		69.0	166.2		mg/Kg	✱	162	20 - 182
Copper	134	F1	69.0	284.8	F1	mg/Kg	✱	218	25 - 157
Lead	76.8	F1	69.0	193.0	F1	mg/Kg	✱	168	62 - 134
Nickel	19.0		69.0	95.37		mg/Kg	✱	111	46 - 154
Zinc	565		69.0	863.4	4	mg/Kg	✱	432	23 - 173

Lab Sample ID: 570-69878-1 MSD

Matrix: Solid

Analysis Batch: 181377

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 181268

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	ND		73.7	78.86		mg/Kg	✱	107	85 - 121	7	12
Chromium	54.1		73.7	176.7		mg/Kg	✱	166	20 - 182	6	15
Copper	134	F1	73.7	295.1	F1	mg/Kg	✱	218	25 - 157	4	22
Lead	76.8	F1	73.7	205.8	F1	mg/Kg	✱	175	62 - 134	6	23
Nickel	19.0		73.7	102.3		mg/Kg	✱	113	46 - 154	7	15
Zinc	565		73.7	901.7	4	mg/Kg	✱	457	23 - 173	4	18

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 570-181297/1-A

Matrix: Solid

Analysis Batch: 181371

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 181297

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0820	0.0133	mg/Kg		09/23/21 09:54	09/23/21 14:20	1

Lab Sample ID: LCS 570-181297/2-A

Matrix: Solid

Analysis Batch: 181371

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 181297

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.833	0.8145		mg/Kg		98	85 - 121

Lab Sample ID: LCSD 570-181297/3-A

Matrix: Solid

Analysis Batch: 181371

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 181297

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.847	0.8272		mg/Kg		98	85 - 121	2	10

Lab Sample ID: 570-69878-1 MS

Matrix: Solid

Analysis Batch: 181371

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 181297

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.222	J	2.38	2.235		mg/Kg	✱	85	71 - 137

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: 570-69878-1 MSD

Matrix: Solid

Analysis Batch: 181371

Client Sample ID: SED-003

Prep Type: Total/NA

Prep Batch: 181297

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.222	J	2.42	2.312		mg/Kg	☆	86	71 - 137	3	14

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 570-178845/64

Matrix: Solid

Analysis Batch: 178845

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	ND		500	174	mg/Kg			09/15/21 10:32	1

Lab Sample ID: MB 570-178845/96

Matrix: Solid

Analysis Batch: 178845

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon, Total Organic	ND		500	174	mg/Kg			09/15/21 10:32	1

Lab Sample ID: LCS 570-178845/65

Matrix: Solid

Analysis Batch: 178845

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon, Total Organic	30000	27050		mg/Kg		90	80 - 120

Lab Sample ID: LCS 570-178845/97

Matrix: Solid

Analysis Batch: 178845

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon, Total Organic	29900	26620		mg/Kg		89	80 - 120

Lab Sample ID: LCSD 570-178845/66

Matrix: Solid

Analysis Batch: 178845

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon, Total Organic	30100	28950		mg/Kg		96	80 - 120	7	20

Lab Sample ID: LCSD 570-178845/98

Matrix: Solid

Analysis Batch: 178845

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon, Total Organic	29900	27960		mg/Kg		94	80 - 120	5	20

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QC Sample Results

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method: Moisture - Percent Moisture

Lab Sample ID: 570-69878-2 DU
Matrix: Solid
Analysis Batch: 179106

Client Sample ID: SED-004
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	49.8		46.5		%		7	10

QC Association Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

GC/MS Semi VOA

Cleanup Batch: 178989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-2	SED-004	Total/NA	Solid	Homogenize Prep	
570-69878-3	SED-005	Total/NA	Solid	Homogenize Prep	
570-69878-4	SED-006	Total/NA	Solid	Homogenize Prep	
570-69878-5	SED-007	Total/NA	Solid	Homogenize Prep	
570-69878-1 MS	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-1 MSD	SED-003	Total/NA	Solid	Homogenize Prep	

Prep Batch: 179948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Organotin Prep	178989
570-69878-2	SED-004	Total/NA	Solid	Organotin Prep	178989
570-69878-3	SED-005	Total/NA	Solid	Organotin Prep	178989
570-69878-4	SED-006	Total/NA	Solid	Organotin Prep	178989
570-69878-5	SED-007	Total/NA	Solid	Organotin Prep	178989
MB 570-179948/1-A	Method Blank	Total/NA	Solid	Organotin Prep	
LCS 570-179948/2-A	Lab Control Sample	Total/NA	Solid	Organotin Prep	
LCSD 570-179948/3-A	Lab Control Sample Dup	Total/NA	Solid	Organotin Prep	

Prep Batch: 180052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	3541	178989
570-69878-2	SED-004	Total/NA	Solid	3541	178989
570-69878-3	SED-005	Total/NA	Solid	3541	178989
570-69878-4	SED-006	Total/NA	Solid	3541	178989
570-69878-5	SED-007	Total/NA	Solid	3541	178989
MB 570-180052/1-A	Method Blank	Total/NA	Solid	3541	
LCS 570-180052/2-A	Lab Control Sample	Total/NA	Solid	3541	
LCSD 570-180052/3-A	Lab Control Sample Dup	Total/NA	Solid	3541	
570-69878-1 MS	SED-003	Total/NA	Solid	3541	178989
570-69878-1 MSD	SED-003	Total/NA	Solid	3541	178989

Analysis Batch: 180477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	8270C SIM	180052
MB 570-180052/1-A	Method Blank	Total/NA	Solid	8270C SIM	180052
LCS 570-180052/2-A	Lab Control Sample	Total/NA	Solid	8270C SIM	180052
LCSD 570-180052/3-A	Lab Control Sample Dup	Total/NA	Solid	8270C SIM	180052
570-69878-1 MS	SED-003	Total/NA	Solid	8270C SIM	180052
570-69878-1 MSD	SED-003	Total/NA	Solid	8270C SIM	180052

Analysis Batch: 181003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-2	SED-004	Total/NA	Solid	8270C SIM	180052
570-69878-3	SED-005	Total/NA	Solid	8270C SIM	180052
570-69878-4	SED-006	Total/NA	Solid	8270C SIM	180052

Eurofins Calscience LLC

QC Association Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

GC/MS Semi VOA (Continued)

Analysis Batch: 181003 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-5	SED-007	Total/NA	Solid	8270C SIM	180052

Analysis Batch: 181787

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Organotins SIM	179948
570-69878-2	SED-004	Total/NA	Solid	Organotins SIM	179948
570-69878-3	SED-005	Total/NA	Solid	Organotins SIM	179948
570-69878-4	SED-006	Total/NA	Solid	Organotins SIM	179948
570-69878-5	SED-007	Total/NA	Solid	Organotins SIM	179948
MB 570-179948/1-A	Method Blank	Total/NA	Solid	Organotins SIM	179948
LCS 570-179948/2-A	Lab Control Sample	Total/NA	Solid	Organotins SIM	179948
LCSD 570-179948/3-A	Lab Control Sample Dup	Total/NA	Solid	Organotins SIM	179948

GC Semi VOA

Cleanup Batch: 178989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-2	SED-004	Total/NA	Solid	Homogenize Prep	
570-69878-3	SED-005	Total/NA	Solid	Homogenize Prep	
570-69878-4	SED-006	Total/NA	Solid	Homogenize Prep	
570-69878-5	SED-007	Total/NA	Solid	Homogenize Prep	
570-69878-1 MS	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-1 MSD	SED-003	Total/NA	Solid	Homogenize Prep	

Prep Batch: 179051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	3550C	178989
570-69878-2	SED-004	Total/NA	Solid	3550C	178989
570-69878-3	SED-005	Total/NA	Solid	3550C	178989
570-69878-4	SED-006	Total/NA	Solid	3550C	178989
570-69878-5	SED-007	Total/NA	Solid	3550C	178989
MB 570-179051/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 570-179051/2-A	Lab Control Sample	Total/NA	Solid	3550C	
LCSD 570-179051/3-A	Lab Control Sample Dup	Total/NA	Solid	3550C	

Analysis Batch: 179136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 570-179051/2-A	Lab Control Sample	Total/NA	Solid	8015B	179051
LCSD 570-179051/3-A	Lab Control Sample Dup	Total/NA	Solid	8015B	179051

Analysis Batch: 179416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	8015B	179051
570-69878-2	SED-004	Total/NA	Solid	8015B	179051
570-69878-3	SED-005	Total/NA	Solid	8015B	179051

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QC Association Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

GC Semi VOA (Continued)

Analysis Batch: 179416 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-4	SED-006	Total/NA	Solid	8015B	179051
570-69878-5	SED-007	Total/NA	Solid	8015B	179051
MB 570-179051/1-A	Method Blank	Total/NA	Solid	8015B	179051

Prep Batch: 180082

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	3541	178989
570-69878-2	SED-004	Total/NA	Solid	3541	178989
570-69878-3	SED-005	Total/NA	Solid	3541	178989
570-69878-4	SED-006	Total/NA	Solid	3541	178989
570-69878-5	SED-007	Total/NA	Solid	3541	178989
MB 570-180082/1-A	Method Blank	Total/NA	Solid	3541	
LCS 570-180082/2-A	Lab Control Sample	Total/NA	Solid	3541	
LCS 570-180082/6-A	Lab Control Sample	Total/NA	Solid	3541	
LCSD 570-180082/3-A	Lab Control Sample Dup	Total/NA	Solid	3541	
LCSD 570-180082/7-A	Lab Control Sample Dup	Total/NA	Solid	3541	
570-69878-1 MS	SED-003	Total/NA	Solid	3541	178989
570-69878-1 MS	SED-003	Total/NA	Solid	3541	178989
570-69878-1 MSD	SED-003	Total/NA	Solid	3541	178989
570-69878-1 MSD	SED-003	Total/NA	Solid	3541	178989

Analysis Batch: 181261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	8082	180082
570-69878-2	SED-004	Total/NA	Solid	8082	180082
570-69878-3	SED-005	Total/NA	Solid	8082	180082
570-69878-4	SED-006	Total/NA	Solid	8082	180082
570-69878-5	SED-007	Total/NA	Solid	8082	180082
MB 570-180082/1-A	Method Blank	Total/NA	Solid	8082	180082
LCS 570-180082/6-A	Lab Control Sample	Total/NA	Solid	8082	180082
LCSD 570-180082/7-A	Lab Control Sample Dup	Total/NA	Solid	8082	180082
570-69878-1 MS	SED-003	Total/NA	Solid	8082	180082
570-69878-1 MSD	SED-003	Total/NA	Solid	8082	180082

Analysis Batch: 181420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	8081A	180082
570-69878-2	SED-004	Total/NA	Solid	8081A	180082
570-69878-3	SED-005	Total/NA	Solid	8081A	180082
570-69878-4	SED-006	Total/NA	Solid	8081A	180082
570-69878-5	SED-007	Total/NA	Solid	8081A	180082
MB 570-180082/1-A	Method Blank	Total/NA	Solid	8081A	180082
LCS 570-180082/2-A	Lab Control Sample	Total/NA	Solid	8081A	180082
LCSD 570-180082/3-A	Lab Control Sample Dup	Total/NA	Solid	8081A	180082
570-69878-1 MS	SED-003	Total/NA	Solid	8081A	180082
570-69878-1 MSD	SED-003	Total/NA	Solid	8081A	180082

QC Association Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Metals

Cleanup Batch: 178989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-2	SED-004	Total/NA	Solid	Homogenize Prep	
570-69878-3	SED-005	Total/NA	Solid	Homogenize Prep	
570-69878-4	SED-006	Total/NA	Solid	Homogenize Prep	
570-69878-5	SED-007	Total/NA	Solid	Homogenize Prep	
570-69878-1 MS	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-1 MSD	SED-003	Total/NA	Solid	Homogenize Prep	

Prep Batch: 181268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	3050B	178989
570-69878-2	SED-004	Total/NA	Solid	3050B	178989
570-69878-3	SED-005	Total/NA	Solid	3050B	178989
570-69878-4	SED-006	Total/NA	Solid	3050B	178989
570-69878-5	SED-007	Total/NA	Solid	3050B	178989
MB 570-181268/1-A ^20	Method Blank	Total/NA	Solid	3050B	
LCS 570-181268/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 570-181268/3-A ^20	Lab Control Sample Dup	Total/NA	Solid	3050B	
570-69878-1 MS	SED-003	Total/NA	Solid	3050B	178989
570-69878-1 MSD	SED-003	Total/NA	Solid	3050B	178989

Prep Batch: 181297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	7471A	178989
570-69878-2	SED-004	Total/NA	Solid	7471A	178989
570-69878-3	SED-005	Total/NA	Solid	7471A	178989
570-69878-4	SED-006	Total/NA	Solid	7471A	178989
570-69878-5	SED-007	Total/NA	Solid	7471A	178989
MB 570-181297/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 570-181297/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 570-181297/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
570-69878-1 MS	SED-003	Total/NA	Solid	7471A	178989
570-69878-1 MSD	SED-003	Total/NA	Solid	7471A	178989

Analysis Batch: 181371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	7471A	181297
570-69878-2	SED-004	Total/NA	Solid	7471A	181297
570-69878-3	SED-005	Total/NA	Solid	7471A	181297
570-69878-4	SED-006	Total/NA	Solid	7471A	181297
570-69878-5	SED-007	Total/NA	Solid	7471A	181297
MB 570-181297/1-A	Method Blank	Total/NA	Solid	7471A	181297
LCS 570-181297/2-A	Lab Control Sample	Total/NA	Solid	7471A	181297
LCSD 570-181297/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	181297
570-69878-1 MS	SED-003	Total/NA	Solid	7471A	181297
570-69878-1 MSD	SED-003	Total/NA	Solid	7471A	181297

Eurofins Calscience LLC

QC Association Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Metals

Analysis Batch: 181377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	6020	181268
570-69878-2	SED-004	Total/NA	Solid	6020	181268
570-69878-3	SED-005	Total/NA	Solid	6020	181268
570-69878-4	SED-006	Total/NA	Solid	6020	181268
570-69878-5	SED-007	Total/NA	Solid	6020	181268
MB 570-181268/1-A ^20	Method Blank	Total/NA	Solid	6020	181268
LCS 570-181268/2-A ^20	Lab Control Sample	Total/NA	Solid	6020	181268
LCSD 570-181268/3-A ^20	Lab Control Sample Dup	Total/NA	Solid	6020	181268
570-69878-1 MS	SED-003	Total/NA	Solid	6020	181268
570-69878-1 MSD	SED-003	Total/NA	Solid	6020	181268

General Chemistry

Analysis Batch: 178845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	9060A	178989
570-69878-2	SED-004	Total/NA	Solid	9060A	178989
570-69878-3	SED-005	Total/NA	Solid	9060A	178989
570-69878-4	SED-006	Total/NA	Solid	9060A	178989
570-69878-5	SED-007	Total/NA	Solid	9060A	178989
MB 570-178845/64	Method Blank	Total/NA	Solid	9060A	
MB 570-178845/96	Method Blank	Total/NA	Solid	9060A	
LCS 570-178845/65	Lab Control Sample	Total/NA	Solid	9060A	
LCS 570-178845/97	Lab Control Sample	Total/NA	Solid	9060A	
LCSD 570-178845/66	Lab Control Sample Dup	Total/NA	Solid	9060A	
LCSD 570-178845/98	Lab Control Sample Dup	Total/NA	Solid	9060A	

Cleanup Batch: 178989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Homogenize Prep	
570-69878-2	SED-004	Total/NA	Solid	Homogenize Prep	
570-69878-3	SED-005	Total/NA	Solid	Homogenize Prep	
570-69878-4	SED-006	Total/NA	Solid	Homogenize Prep	
570-69878-5	SED-007	Total/NA	Solid	Homogenize Prep	

Analysis Batch: 179106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	Moisture	
570-69878-2	SED-004	Total/NA	Solid	Moisture	
570-69878-3	SED-005	Total/NA	Solid	Moisture	
570-69878-4	SED-006	Total/NA	Solid	Moisture	
570-69878-5	SED-007	Total/NA	Solid	Moisture	
570-69878-2 DU	SED-004	Total/NA	Solid	Moisture	

QC Association Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Geotechnical

Analysis Batch: 181620

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-69878-1	SED-003	Total/NA	Solid	D4464	
570-69878-2	SED-004	Total/NA	Solid	D4464	
570-69878-3	SED-005	Total/NA	Solid	D4464	
570-69878-4	SED-006	Total/NA	Solid	D4464	
570-69878-5	SED-007	Total/NA	Solid	D4464	

Lab Chronicle

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-003

Lab Sample ID: 570-69878-1

Date Collected: 09/09/21 17:55

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.12 g	2 mL	180052	09/17/21 18:49	USUL	ECL 1
Total/NA	Analysis	8270C SIM		2			180477	09/20/21 21:52	AJ2Q	ECL 1
Instrument ID: GCMSAAA										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	Organotin Prep			10.04 g	5 mL	179948	09/17/21 12:08	UWEZ	ECL 1
Total/NA	Analysis	Organotins SIM		1			181787	09/24/21 22:36	AJ2Q	ECL 1
Instrument ID: GCMSY										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3550C			10.23 g	10 mL	179051	09/14/21 12:44	UYUW	ECL 1
Total/NA	Analysis	8015B		1			179416	09/16/21 08:37	N1A	ECL 1
Instrument ID: GC47										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			19.99 g	2 mL	180082	09/17/21 20:21	UM1W	ECL 1
Total/NA	Analysis	8081A		5			181420	09/23/21 19:19	UHHN	ECL 1
Instrument ID: GC44										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			19.99 g	2 mL	180082	09/17/21 20:21	UM1W	ECL 1
Total/NA	Analysis	8082		1			181261	09/23/21 18:29	UHHN	ECL 1
Instrument ID: GC58										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3050B			2.03 g	100 mL	181268	09/23/21 08:25	WL8G	ECL 1
Total/NA	Analysis	6020		20			181377	09/23/21 13:56	UFLE	ECL 1
Instrument ID: ICPMS05										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	7471A			.61 g	100 mL	181297	09/23/21 09:54	WL8G	ECL 1
Total/NA	Analysis	7471A		1			181371	09/23/21 14:29	VWJ7	ECL 1
Instrument ID: HG7										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Analysis	9060A		1	209.5 mg	118.1 mg	178845	09/15/21 10:51	CY2M	ECL 1
Instrument ID: TOC9										
Total/NA	Analysis	Moisture		1			179106	09/14/21 16:15	VWM4	ECL 1
Instrument ID: GC54										
Total/NA	Analysis	D4464		1			181620	09/23/21 15:57	C4LT	ECL 1
Instrument ID: NOEQUIP										

Client Sample ID: SED-004

Lab Sample ID: 570-69878-2

Date Collected: 09/09/21 13:30

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.14 g	2 mL	180052	09/17/21 18:49	USUL	ECL 1
Total/NA	Analysis	8270C SIM		2			181003	09/23/21 03:11	AJ2Q	ECL 1
Instrument ID: GCMSAAA										

Eurofins Calscience LLC

Lab Chronicle

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-004

Lab Sample ID: 570-69878-2

Date Collected: 09/09/21 13:30

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	Organotin Prep			10.27 g	5 mL	179948	09/17/21 12:08	UWEZ	ECL 1
Total/NA	Analysis	Organotins SIM		1			181787	09/24/21 22:54	AJ2Q	ECL 1
Instrument ID: GCMSY										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3550C			9.94 g	10 mL	179051	09/14/21 12:44	UYUW	ECL 1
Total/NA	Analysis	8015B		1			179416	09/16/21 08:59	N1A	ECL 1
Instrument ID: GC47										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.06 g	2 mL	180082	09/17/21 20:21	UM1W	ECL 1
Total/NA	Analysis	8081A		5			181420	09/23/21 19:34	UHHN	ECL 1
Instrument ID: GC44										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.06 g	2 mL	180082	09/17/21 20:21	UM1W	ECL 1
Total/NA	Analysis	8082		1			181261	09/23/21 18:47	UHHN	ECL 1
Instrument ID: GC58										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3050B			1.99 g	100 mL	181268	09/23/21 08:25	WL8G	ECL 1
Total/NA	Analysis	6020		20			181377	09/23/21 14:18	UFLE	ECL 1
Instrument ID: ICPMS05										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	7471A			.63 g	100 mL	181297	09/23/21 09:54	WL8G	ECL 1
Total/NA	Analysis	7471A		1			181371	09/23/21 14:34	VWJ7	ECL 1
Instrument ID: HG7										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Analysis	9060A		1	202.7 mg	202.7 mg	178845	09/16/21 10:51	CY2M	ECL 1
Instrument ID: TOC9										
Total/NA	Analysis	Moisture		1			179106	09/14/21 16:15	VWM4	ECL 1
Instrument ID: GC54										
Total/NA	Analysis	D4464		1			181620	09/23/21 16:03	C4LT	ECL 1
Instrument ID: NOEQUIP										

Client Sample ID: SED-005

Lab Sample ID: 570-69878-3

Date Collected: 09/09/21 15:45

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.17 g	2 mL	180052	09/17/21 18:49	USUL	ECL 1
Total/NA	Analysis	8270C SIM		2			181003	09/23/21 03:30	AJ2Q	ECL 1
Instrument ID: GCMSAAA										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	Organotin Prep			10.19 g	5 mL	179948	09/17/21 12:08	UWEZ	ECL 1
Total/NA	Analysis	Organotins SIM		1			181787	09/24/21 23:11	AJ2Q	ECL 1
Instrument ID: GCMSY										

Eurofins Calscience LLC

Lab Chronicle

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-005

Lab Sample ID: 570-69878-3

Date Collected: 09/09/21 15:45

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3550C			9.90 g	10 mL	179051	09/14/21 12:44	UYUW	ECL 1
Total/NA	Analysis	8015B		1			179416	09/16/21 09:21	N1A	ECL 1
Instrument ID: GC47										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.08 g	2 mL	180082	09/17/21 20:23	UM1W	ECL 1
Total/NA	Analysis	8081A		5			181420	09/23/21 19:48	UHHN	ECL 1
Instrument ID: GC44										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.08 g	2 mL	180082	09/17/21 20:23	UM1W	ECL 1
Total/NA	Analysis	8082		1			181261	09/23/21 19:05	UHHN	ECL 1
Instrument ID: GC58										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3050B			2.05 g	100 mL	181268	09/23/21 08:25	WL8G	ECL 1
Total/NA	Analysis	6020		20			181377	09/23/21 14:21	UFLE	ECL 1
Instrument ID: ICPMS05										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	7471A			.57 g	100 mL	181297	09/23/21 09:54	WL8G	ECL 1
Total/NA	Analysis	7471A		1			181371	09/23/21 14:36	VWJ7	ECL 1
Instrument ID: HG7										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Analysis	9060A		1	205.5 mg	205.5 mg	178845	09/16/21 10:51	CY2M	ECL 1
Instrument ID: TOC9										
Total/NA	Analysis	Moisture		1			179106	09/14/21 16:15	VWM4	ECL 1
Instrument ID: GC54										
Total/NA	Analysis	D4464		1			181620	09/23/21 16:09	C4LT	ECL 1
Instrument ID: NOEQUIP										

Client Sample ID: SED-006

Lab Sample ID: 570-69878-4

Date Collected: 09/09/21 10:25

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.13 g	2 mL	180052	09/17/21 18:49	USUL	ECL 1
Total/NA	Analysis	8270C SIM		2			181003	09/23/21 03:50	AJ2Q	ECL 1
Instrument ID: GCMSAAA										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	Organotin Prep			10.17 g	5 mL	179948	09/17/21 12:08	UWEZ	ECL 1
Total/NA	Analysis	Organotins SIM		1			181787	09/24/21 23:28	AJ2Q	ECL 1
Instrument ID: GCMSY										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3550C			10.01 g	10 mL	179051	09/14/21 12:44	UYUW	ECL 1
Total/NA	Analysis	8015B		1			179416	09/16/21 09:44	N1A	ECL 1
Instrument ID: GC47										

Eurofins Calscience LLC

Lab Chronicle

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-006

Lab Sample ID: 570-69878-4

Date Collected: 09/09/21 10:25

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.12 g	2 mL	180082	09/17/21 20:23	UM1W	ECL 1
Total/NA	Analysis	8081A		5			181420	09/23/21 20:02	UHHN	ECL 1
Instrument ID: GC44										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.12 g	2 mL	180082	09/17/21 20:23	UM1W	ECL 1
Total/NA	Analysis	8082		1			181261	09/23/21 19:23	UHHN	ECL 1
Instrument ID: GC58										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3050B			2.00 g	100 mL	181268	09/23/21 08:25	WL8G	ECL 1
Total/NA	Analysis	6020		20			181377	09/23/21 14:24	UFLE	ECL 1
Instrument ID: ICPMS05										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	7471A			.61 g	100 mL	181297	09/23/21 09:54	WL8G	ECL 1
Total/NA	Analysis	7471A		1			181371	09/23/21 14:38	VWJ7	ECL 1
Instrument ID: HG7										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Analysis	9060A		1	200.0 mg	200.0 mg	178845	09/15/21 10:32	CY2M	ECL 1
Instrument ID: TOC9										
Total/NA	Analysis	Moisture		1			179106	09/14/21 16:15	VWM4	ECL 1
Instrument ID: GC54										
Total/NA	Analysis	D4464		1			181620	09/23/21 16:15	C4LT	ECL 1
Instrument ID: NOEQUIP										

Client Sample ID: SED-007

Lab Sample ID: 570-69878-5

Date Collected: 09/09/21 11:30

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.11 g	2 mL	180052	09/17/21 18:49	USUL	ECL 1
Total/NA	Analysis	8270C SIM		5			181003	09/23/21 04:10	AJ2Q	ECL 1
Instrument ID: GCMSAAA										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	Organotin Prep			10.16 g	5 mL	179948	09/17/21 12:08	UWEZ	ECL 1
Total/NA	Analysis	Organotins SIM		1			181787	09/24/21 23:46	AJ2Q	ECL 1
Instrument ID: GCMSY										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3550C			9.93 g	10 mL	179051	09/14/21 12:44	UYUW	ECL 1
Total/NA	Analysis	8015B		1			179416	09/16/21 10:07	N1A	ECL 1
Instrument ID: GC47										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.14 g	2 mL	180082	09/17/21 20:23	UM1W	ECL 1
Total/NA	Analysis	8081A		5			181420	09/23/21 20:16	UHHN	ECL 1
Instrument ID: GC44										

Eurofins Calscience LLC

Lab Chronicle

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Client Sample ID: SED-007

Lab Sample ID: 570-69878-5

Date Collected: 09/09/21 11:30

Matrix: Solid

Date Received: 09/13/21 13:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3541			20.14 g	2 mL	180082	09/17/21 20:23	UM1W	ECL 1
Total/NA	Analysis	8082		1			181261	09/23/21 19:41	UHHN	ECL 1
Instrument ID: GC58										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	3050B			1.97 g	100 mL	181268	09/23/21 08:25	WL8G	ECL 1
Total/NA	Analysis	6020		20			181377	09/23/21 14:28	UFLE	ECL 1
Instrument ID: ICPMS05										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Prep	7471A			.60 g	100 mL	181297	09/23/21 09:54	WL8G	ECL 1
Total/NA	Analysis	7471A		1			181371	09/23/21 14:40	VWJ7	ECL 1
Instrument ID: HG7										
Total/NA	Cleanup	Homogenize Prep					178989	09/14/21 10:06	C4LT	ECL 1
Total/NA	Analysis	9060A		1	68.1 mg	68.1 mg	178845	09/15/21 10:32	CY2M	ECL 1
Instrument ID: TOC9										
Total/NA	Analysis	Moisture		1			179106	09/14/21 16:15	VWM4	ECL 1
Instrument ID: GC54										
Total/NA	Analysis	D4464		1			181620	09/23/21 16:24	C4LT	ECL 1
Instrument ID: NOEQUIP										

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Accreditation/Certification Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Laboratory: Eurofins Calscience LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
California	State	2944	09-30-21
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
9060A		Solid	Carbon, Total Organic
D4464		Solid	Clay (less than 0.00391 mm)
D4464		Solid	Coarse Sand (0.5mm to 1mm)
D4464		Solid	Fine Sand (0.125 to 0.25mm)
D4464		Solid	Gravel (greater than 2 mm)
D4464		Solid	Medium Sand (0.25 to 0.5 mm)
D4464		Solid	Silt (0.00391 to 0.0625mm)
D4464		Solid	Total Silt and Clay (0 to 0.0626mm)
D4464		Solid	Very Coarse Sand (1 to 2mm)
D4464		Solid	Very Fine Sand (0.0625 to 0.125 mm)
Moisture		Solid	Percent Moisture
Organotins SIM	Organotin Prep	Solid	Tributyltin
Oregon	NELAP	CA300001	01-30-22
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
D4464		Solid	Clay (less than 0.00391 mm)
D4464		Solid	Coarse Sand (0.5mm to 1mm)
D4464		Solid	Fine Sand (0.125 to 0.25mm)
D4464		Solid	Gravel (greater than 2 mm)
D4464		Solid	Medium Sand (0.25 to 0.5 mm)
D4464		Solid	Silt (0.00391 to 0.0625mm)
D4464		Solid	Total Silt and Clay (0 to 0.0626mm)
D4464		Solid	Very Coarse Sand (1 to 2mm)
D4464		Solid	Very Fine Sand (0.0625 to 0.125 mm)
Moisture		Solid	Percent Moisture

Method Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Method	Method Description	Protocol	Laboratory
8270C SIM	PAHs (GC/MS SIM)	SW846	ECL 1
Organotins SIM	Organotins (GC/MS SIM)	Lab SOP	ECL 1
8015B	Diesel Range Organics (DRO) (GC)	SW846	ECL 1
8081A	Organochlorine Pesticides (GC)	SW846	ECL 1
8082	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	ECL 1
6020	Metals (ICP/MS)	SW846	ECL 1
7471A	Mercury (CVAA)	SW846	ECL 1
9060A	Organic Carbon, Total (TOC)	SW846	ECL 1
Moisture	Percent Moisture	EPA	ECL 1
D4464	Particle Size Distribution of Catalytic Material (Laser light scattering)	ASTM	ECL 1
3050B	Preparation, Metals	SW846	ECL 1
3541	Automated Soxhlet Extraction	SW846	ECL 1
3550C	Ultrasonic Extraction	SW846	ECL 1
7471A	Preparation, Mercury	SW846	ECL 1
Homogenize Prep	Preparation, Homogenization	None	ECL 1
Organotin Prep	Extraction (Organotins)	None	ECL 1

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

Lab SOP = Laboratory Standard Operating Procedure

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Sample Summary

Client: WGR Southwest Inc
Project/Site: Tesoro LA Refinery

Job ID: 570-69878-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
570-69878-1	SED-003	Solid	09/09/21 17:55	09/13/21 13:50
570-69878-2	SED-004	Solid	09/09/21 13:30	09/13/21 13:50
570-69878-3	SED-005	Solid	09/09/21 15:45	09/13/21 13:50
570-69878-4	SED-006	Solid	09/09/21 10:25	09/13/21 13:50
570-69878-5	SED-007	Solid	09/09/21 11:30	09/13/21 13:50

Tesoro Los Angeles Refinery - Carson Operations

Facility Name LA Refinery - Carson Operations						City, State (Facility) 1801 E. Sepulveda Blvd., Carson CA 90749						Project Manager (Consultant) Chelsea Dreyer						Project No. (Consultant) 021.APC.01						Laboratory Name Eurofins Calscience 7440 Lincoln Way Garden Grove 92841 (714) 895-5494					
Facility Contact Nate Busch						Facility Telephone No. (310) 847-3920						Telephone No. (Consultant) (562) 799-8510 ex. 1003						Fax No (Consultant) (562) 799-8510						Lab Project Manager Xuan Dang					
Consultant Company WGR Southwest, Inc.						Consultant Address 11021 Winners Circle #101 Los Alamitos, California 90720												Special Detection Limit/Reporting											
Sample I.D.	Lab Sample No.	No. of Containers	Matrix				Prsv.		Sampling Date	Sampling Time	Total Metals (see text box)	Chlordane EPA 8081A	PCBs (EPA 8082 - see text box)	Sediment grain size ASTM D4464	DDT (see text box)	Total Organic Carbon EPA 9060A	TPH EPA 8015B	Tributyltin Krone et al.	PAHs (EPA 8270C - see text box)	pH (SU) [6.5-8.5]	Salinity (PSU)	Dissolved Oxygen (mg/L) [mean>7; single>5]	Specific Conductance (S/m)	Turbidity (NTU) [<50]	Flow (units =) [if possible]	Please report MDL and RL for all analytes			
			Soil	Water	Air	Other	Yes	No																					
																									Duplicate samples must be analyzed at a frequency of 5%				
SED-001																									Special QA/QC				
SED-002																									Sub'd COC Atch'd				
SED-003		1	X				X		9/9/21	17:55	X	X	X	X	X	X	X	X	X										
SED-004		1	X				X		9/9/21	13:30	X	X	X	X	X	X	X	X	X										
SED-005		1	X				X		9/9/21	15:45	X	X	X	X	X	X	X	X	X										
SED-006		1	X				X		9/9/21	10:25	X	X	X	X	X	X	X	X	X										
SED-007		1	X				X		9/9/21	11:30	X	X	X	X	X	X	X	X	X										
Total Metals analyzed with EPA 6020: Cadmium; Chromium; Copper; Lead; Nickel; Zinc Total Metals analyzed with EPA 7471A: Mercury PCBs Sum of Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, and Arochlor 1260 DDT Sum of 4,4'-DDT, 2,4'-DDT, 4,4'-DDE, 2,4'-DDE, 4,4'-DDD, and 2,4'-DDD PAHs Sum of acenaphthene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo(k)fluoranthene, 1,12-benzoperylene,																													
Sample Received Intact: Yes No						Temperature received Ice No ice																							
Relinquished by SAMPLER (Print & Sign Name) <i>David Montelongo</i>						Date Time 9/13/21 1350						Received by (Print & Sign Name) <i>J BATEL</i>																	
Relinquished by (Print & Sign Name)						Date Time						Received by LABORATORY (Print & Sign Name)																	
												Lab Work No.																	

Revised 9/23/2019

4.3 | 3.9 SCG

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9/27/2021

Login Sample Receipt Checklist

Client: WGR Southwest Inc

Job Number: 570-69878-1

Login Number: 69878

List Source: Eurofins Calscience LLC

List Number: 1

Creator: Patel, Jayesh

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT 4

SEDIMENT MONITORING AQUATIC BIOASSAY ANALYTICAL LABORATORY REPORT



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA R-95/136. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-003
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR0921.057

CHRONIC MYTILUS SEDIMENT WATER INTERFACE BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:42 (p 1 of 1)
Test Code/ID: WGR0921.057m / 00-2390-6977

Mussel Shell Development Test				Aquatic Bioassay & Consulting Labs, Inc.			
Batch ID:	14-2542-4023	Test Type:	Development-Survival	Analyst:	Joe Freas		
Start Date:	15 Sep-21 14:00	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Water		
Ending Date:	17 Sep-21 14:00	Species:	Mytilus galloprovincialis	Brine:			
Test Length:	48h	Taxon:	Bivalvia	Source:	Carlsbad Aquafarms CA	Age:	
Sample ID:	12-7725-2937	Code:	WGR0921.057m	Project:	021.APC.01		
Sample Date:	09 Sep-21 17:55	Material:	Sediment	Source:	Bioassay Report		
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-003		
Sample Age:	5d 20h	Client:	WGR Southwest Inc.				

Single Comparison Summary					
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
06-9847-2318	Combined Proportion Normal	Equal Variance t Two-Sample Test	0.9194	100% passed combined proportion normal	1

Test Acceptability		TAC Limits					
Analysis ID	Endpoint	Attribute	Test Stat	Lower	Upper	Overlap	Decision
06-9847-2318	Combined Proportion Normal	PMSD	0.02569	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	0.9507	0.9359	0.9654	0.9372	0.9686	0.0053	0.0119	1.25%	0.00%
100		5	0.9659	0.9408	0.9910	0.9372	0.9865	0.0090	0.0202	2.09%	-1.60%

Combined Proportion Normal Detail							MD5: 6ED3AFBFEAE62CDA78BFAE65FB34648A				
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
0	N	0.9462	0.9372	0.9552	0.9686	0.9462					
100		0.9372	0.9552	0.9865	0.9821	0.9686					

Combined Proportion Normal Binomials						
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	211/223	209/223	213/223	216/223	211/223
100		209/223	213/223	220/223	219/223	216/223

CETIS Analytical Report

Report Date: 02 Nov-21 11:42 (p 1 of 2)
 Test Code/ID: WGR0921.057m / 00-2390-6977

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 06-9847-2318	Endpoint: Combined Proportion Normal	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:27	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:26	MD5 Hash: 6ED3AFBFEAE62CDA78BFAE65FB34648A	Editor ID: 007-979-628-1
Batch ID: 14-2542-4023	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:00	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:00	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 12-7725-2937	Code: WGR0921.057m	Project: 021.APC.01
Sample Date: 09 Sep-21 17:55	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-003
Sample Age: 5d 20h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed combined proportion normal endpoint	2.57%

Equal Variance t Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	-1.544	1.86	0.052	8	CDF	0.9194	Non-Significant Effect

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
PMSD	0.02569	<<	0.25	No	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0047363	0.0047363	1	2.383	0.1612	Non-Significant Effect
Error	0.0158986	0.0019873	8			
Total	0.0206349		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	2.303	11.26	0.1676	Equal Variances
	Mod Levene Equality of Variance Test	4.169	13.75	0.0872	Equal Variances
	Variance Ratio F Test	3.864	23.15	0.2189	Equal Variances
Distribution	Anderson-Darling A2 Test	0.2636	3.878	0.7260	Normal Distribution
	D'Agostino Skewness Test	0.1538	2.576	0.8777	Normal Distribution
	Kolmogorov-Smirnov D Test	0.155	0.3025	0.8697	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9634	0.7411	0.8237	Normal Distribution

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	0.9507	0.9359	0.9654	0.9462	0.9372	0.9686	0.0053	1.25%	0.00%
100		5	0.9659	0.9408	0.9910	0.9686	0.9372	0.9865	0.0090	2.09%	-1.60%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3480	1.3130	1.3840	1.3370	1.3180	1.3930	0.0128	2.12%	0.00%
100		5	1.3920	1.3220	1.4620	1.3930	1.3180	1.4550	0.0251	4.04%	-3.23%

Combined Proportion Normal Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9372	0.9552	0.9686	0.9462
100		0.9372	0.9552	0.9865	0.9821	0.9686

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3370	1.3180	1.3570	1.3930	1.3370
100		1.3180	1.3570	1.4550	1.4360	1.3930

CETIS Analytical Report

Report Date: 02 Nov-21 11:42 (p 2 of 2)
 Test Code/ID: WGR0921.057m / 00-2390-6977

Mussel Shell Development Test

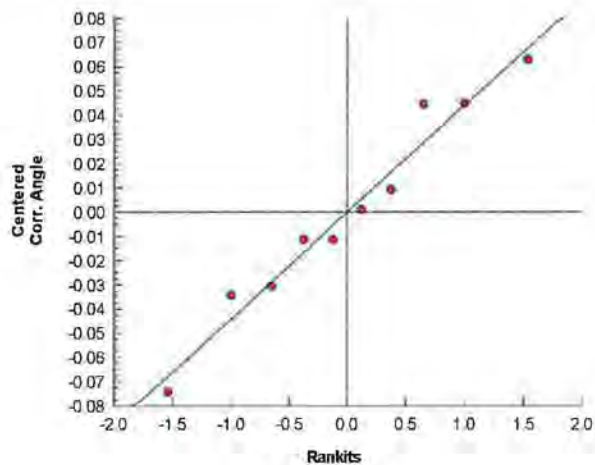
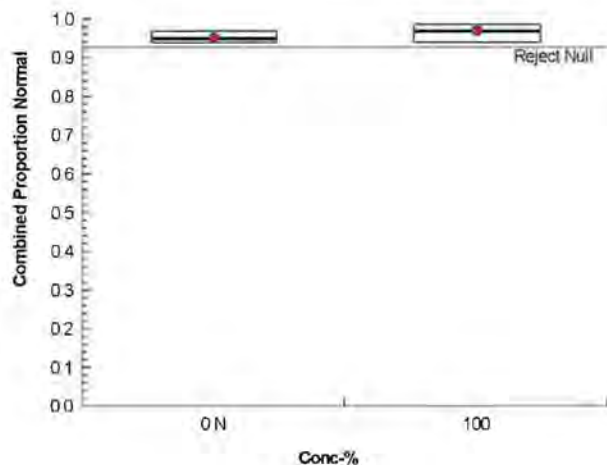
Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 06-9847-2318 Endpoint: Combined Proportion Normal CETIS Version: CETISv1.9.7
 Analyzed: 02 Nov-21 11:27 Analysis: Parametric-Two Sample Status Level: 1
 Edit Date: 02 Nov-21 11:26 MD5 Hash: 6ED3AFBFEAE62CDA78BFAE65FB34648A Editor ID: 007-979-628-1

Combined Proportion Normal Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	211/223	209/223	213/223	216/223	211/223
100		209/223	213/223	220/223	219/223	216/223

Graphics



CETIS Measurement Report

Report Date: 02 Nov-21 11:42 (p 1 of 1)
Test Code/ID: WGR0921.057m / 00-2390-6977

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	14-2542-4023	Test Type:	Development-Survival	Analyst:	Joe Freas
Start Date:	15 Sep-21 14:00	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Water
Ending Date:	17 Sep-21 14:00	Species:	Mytilus galloprovincialis	Brine:	
Test Length:	48h	Taxon:	Bivalvia	Source:	Carlsbad Aquafarms CA
				Age:	
Sample ID:	12-7725-2937	Code:	WGR0921.057m	Project:	021.APC.01
Sample Date:	09 Sep-21 17:55	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-003
Sample Age:	5d 20h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
Overall		4	7.9	7.9	7.9	7.9	7.9	0	0	0.00%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
Overall		4	34	34	34	34	34	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA R-95/136*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-004
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR0921.058

CHRONIC MYTILUS SEDIMENT WATER INTERFACE BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:42 (p 1 of 1)
Test Code/ID: WGR0921.058m / 20-8116-3439

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 03-3679-5267	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:01	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:01	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 13-1482-2030	Code: WGR0921.058m	Project: 021.APC.01
Sample Date: 09 Sep-21 13:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-004
Sample Age: 6d 1h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-7737-4847	Combined Proportion Normal	Equal Variance t Two-Sample Test	0.3542	100% passed combined proportion normal	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
05-7737-4847	Combined Proportion Normal	PMSD	0.0204	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	0.9498	0.9343	0.9652	0.9372	0.9686	0.0056	0.0124	1.31%	0.00%
100		5	0.9453	0.9222	0.9684	0.9193	0.9686	0.0083	0.0186	1.97%	0.47%

Combined Proportion Normal Detail

MD5: 29869EE48FA59A745BE0FA0B871224B5

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9552	0.9686	0.9417	0.9372
100		0.9686	0.9462	0.9193	0.9372	0.9552

Combined Proportion Normal Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	211/223	213/223	216/223	210/223	209/223
100		216/223	211/223	205/223	209/223	213/223

CETIS Analytical Report

Report Date: 02 Nov-21 11:42 (p 1 of 2)
 Test Code/ID: WGR0921.058m / 20-8116-3439

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 05-7737-4847	Endpoint: Combined Proportion Normal	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:31	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:30	MD5 Hash: 29869EE48FA59A745BE0FA0B87122485	Editor ID: 007-979-628-1
Batch ID: 03-3679-5267	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:01	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:01	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 13-1482-2030	Code: WGR0921.058m	Project: 021.APC.01
Sample Date: 09 Sep-21 13:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-004
Sample Age: 6d 1h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed combined proportion normal endpoint	2.04%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	0.3876	1.86	0.042	8	CDF	0.3542	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
PMSD	0.0204	<<	0.25	No	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0001956	0.0001956	1	0.1503	0.7084	Non-Significant Effect
Error	0.0104114	0.0013014	8			
Total	0.0106069		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	0.3106	11.26	0.5926	Equal Variances
	Mod Levene Equality of Variance Test	0.5941	13.75	0.4701	Equal Variances
	Variance Ratio F Test	1.917	23.15	0.5440	Equal Variances
Distribution	Anderson-Darling A2 Test	0.2252	3.878	0.8528	Normal Distribution
	D'Agostino Skewness Test	0.3997	2.576	0.6894	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1149	0.3025	1.0000	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9692	0.7411	0.8836	Normal Distribution

Combined Proportion Normal Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	0.9498	0.9343	0.9652		0.9372	0.9686	0.0056	1.31%	0.00%
100		5	0.9453	0.9222	0.9684		0.9193	0.9686	0.0083	1.97%	0.47%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3460	1.3090	1.3830		1.3180	1.3930	0.0134	2.22%	0.00%
100		5	1.3370	1.2860	1.3890		1.2830	1.3930	0.0185	3.09%	0.66%

Combined Proportion Normal Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9552	0.9686	0.9417	0.9372
100		0.9686	0.9462	0.9193	0.9372	0.9552

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3370	1.3570	1.3930	1.3270	1.3180
100		1.3930	1.3370	1.2830	1.3180	1.3570

CETIS Analytical Report

Report Date: 02 Nov-21 11:42 (p 2 of 2)
Test Code/ID: WGR0921.058m / 20-8116-3439

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	05-7737-4847	Endpoint:	Combined Proportion Normal	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:31	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:30	MD5 Hash:	29869EE48FA59A745BE0FA0B871224B5	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:42 (p 1 of 1)
Test Code/ID: WGR0921.058m / 20-8116-3439

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	03-3679-5267	Test Type:	Development-Survival	Analyst:	Joe Freas
Start Date:	15 Sep-21 14:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Water
Ending Date:	17 Sep-21 14:01	Species:	Mytilus galloprovincialis	Brine:	
Test Length:	48h	Taxon:	Bivalvia	Source:	Carlsbad Aquafarms CA
				Age:	
Sample ID:	13-1482-2030	Code:	WGR0921.058m	Project:	021.APC.01
Sample Date:	09 Sep-21 13:30	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-004
Sample Age:	6d 1h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.8	6.529	9.071	7.7	7.9	0.07071	0.1414	1.81%	0
Overall		4	7.85	7.691	8.009	7.7	7.9	0.05	0.1	1.27%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
Overall		4	34	34	34	34	34	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA/R-95/136. Results were as follows:

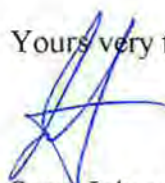
CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-005
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR0921.059

CHRONIC MYTILUS SEDIMENT WATER INTERFACE BIOASSAY

NOEC =	100.00 %
TUc =	1.00

EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


m Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:43 (p 1 of 1)
Test Code/ID: WGR0921.059m / 02-1589-1346

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 00-0039-7275	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:02	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:02	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 17-4634-0978	Code: WGR0921.059m	Project: 021.APC.01
Sample Date: 09 Sep-21 15:45	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 5d 22h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
04-1613-8136	Combined Proportion Normal	Equal Variance t Two-Sample Test	0.7164	100% passed combined proportion normal	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
04-1613-8136	Combined Proportion Normal	PMSD	0.02426	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	0.9516	0.9295	0.9736	0.9238	0.9686	0.0079	0.0178	1.87%	0.00%
100		5	0.9578	0.9357	0.9800	0.9372	0.9821	0.0080	0.0178	1.86%	-0.66%

Combined Proportion Normal Detail

MD5: 2E266481F9703A5DBFBE66630FE736E3

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9238	0.9552	0.9686	0.9641
100		0.9552	0.9686	0.9821	0.9462	0.9372

Combined Proportion Normal Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	211/223	206/223	213/223	216/223	215/223
100		213/223	216/223	219/223	211/223	209/223

CETIS Analytical Report

Report Date: 02 Nov-21 11:43 (p 1 of 2)
Test Code/ID: WGR0921.059m / 02-1589-1346

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 04-1613-8136	Endpoint: Combined Proportion Normal	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:34	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:34	MD5 Hash: 2E266481F9703A5DBFBE66630FE736E3	Editor ID: 007-979-628-1
Batch ID: 00-0039-7275	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:02	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:02	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 17-4634-0978	Code: WGR0921.059m	Project: 021.APC.01
Sample Date: 09 Sep-21 15:45	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 5d 22h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed combined proportion normal endpoint	2.43%

Equal Variance t Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	-0.5968	1.86	0.052	8	CDF	0.7164	Non-Significant Effect

Test Acceptability Criteria

TAC Limits					
Attribute	Test Stat	Lower	Upper	Overlap	Decision
PMSD	0.02426	<<	0.25	No	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.000684	0.000684	1	0.3561	0.5672	Non-Significant Effect
Error	0.0153645	0.0019206	8			
Total	0.0160484		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	0.246	11.26	0.6333	Equal Variances
	Mod Levene Equality of Variance Test	0.2079	13.75	0.6645	Equal Variances
	Variance Ratio F Test	1.39	23.15	0.7576	Equal Variances
Distribution	Anderson-Darling A2 Test	0.1628	3.878	0.9934	Normal Distribution
	D'Agostino Skewness Test	0.1152	2.576	0.9083	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1236	0.3025	1.0000	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9764	0.7411	0.9429	Normal Distribution

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	0.9516	0.9295	0.9736		0.9238	0.9686	0.0079	1.87%	0.00%
100		5	0.9578	0.9357	0.9800		0.9372	0.9821	0.0080	1.86%	-0.66%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3520	1.3020	1.4010		1.2910	1.3930	0.0179	2.97%	0.00%
100		5	1.3680	1.3090	1.4270		1.3180	1.4360	0.0211	3.45%	-1.22%

Combined Proportion Normal Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9238	0.9552	0.9686	0.9641
100		0.9552	0.9686	0.9821	0.9462	0.9372

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3370	1.2910	1.3570	1.3930	1.3800
100		1.3570	1.3930	1.4360	1.3370	1.3180

CETIS Analytical Report

Report Date: 02 Nov-21 11:43 (p 2 of 2)
Test Code/ID: WGR0921.059m / 02-1589-1346

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	04-1613-8136	Endpoint:	Combined Proportion Normal	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:34	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:34	MD5 Hash:	2E266481F9703A5DBFBE66630FE736E3	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:43 (p 1 of 1)
Test Code/ID: WGR0921.059m / 02-1589-1346

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 00-0039-7275	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:02	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:02	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 17-4634-0978	Code: WGR0921.059m	Project: 021.APC.01
Sample Date: 09 Sep-21 15:45	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 5d 22h	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10	10	10	10	10	0	0	0.00%	0
Overall		4	10.03	9.945	10.1	10	10.1	0.025	0.05	0.50%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.65	7.015	8.285	7.6	7.7	0.03535	0.07071	0.92%	0
Overall		4	7.775	7.536	8.014	7.6	7.9	0.075	0.15	1.93%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
Overall		4	34	34	34	34	34	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA/R-95/136. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-006
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR0921.060

CHRONIC MYTILUS SEDIMENT WATER INTERFACE BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:43 (p 1 of 1)
Test Code/ID: WGR0921.060m / 18-0660-0583

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	06-9719-5450	Test Type:	Development-Survival	Analyst:	Joe Freas
Start Date:	15 Sep-21 14:03	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Water
Ending Date:	17 Sep-21 14:03	Species:	Mytilus galloprovincialis	Brine:	
Test Length:	48h	Taxon:	Bivalvia	Source:	Carlsbad Aquafarms CA Age:
Sample ID:	00-3490-9640	Code:	WGR0921.060m	Project:	021.APC.01
Sample Date:	09 Sep-21 10:25	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-006
Sample Age:	6d 4h	Client:	WGR Southwest Inc.		

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
05-1624-1213	Combined Proportion Normal	Equal Variance t Two-Sample Test	0.8963	100% passed combined proportion normal	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
05-1624-1213	Combined Proportion Normal	PMSD	0.01979	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	0.9543	0.9383	0.9702	0.9372	0.9686	0.0057	0.0128	1.35%	0.00%
100		5	0.9659	0.9472	0.9846	0.9462	0.9821	0.0067	0.0151	1.56%	-1.22%

Combined Proportion Normal Detail

MD5: 4F685257C61FC36E6CFF35C0064860B5

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9552	0.9686	0.9641	0.9372
100		0.9552	0.9686	0.9776	0.9462	0.9821

Combined Proportion Normal Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	211/223	213/223	216/223	215/223	209/223
100		213/223	216/223	218/223	211/223	219/223

CETIS Analytical Report

Report Date: 02 Nov-21 11:43 (p 1 of 2)
 Test Code/ID: WGR0921.060m / 18-0660-0583

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 05-1624-1213	Endpoint: Combined Proportion Normal	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:37	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:37	MD5 Hash: 4F685257C61FC36E6CFF35C0064860B5	Editor ID: 007-979-628-1
Batch ID: 06-9719-5450	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:03	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:03	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 00-3490-9640	Code: WGR0921.060m	Project: 021.APC.01
Sample Date: 09 Sep-21 10:25	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-006
Sample Age: 6d 4h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed combined proportion normal endpoint	1.98%

Equal Variance t Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	-1.372	1.86	0.043	8	CDF	0.8963	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
PMSD	0.01979	<<	0.25	No	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0025338	0.0025338	1	1.881	0.2074	Non-Significant Effect
Error	0.0107747	0.0013468	8			
Total	0.0133085		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	0.7642	11.26	0.4075	Equal Variances
	Mod Levene Equality of Variance Test	2.084	13.75	0.1990	Equal Variances
	Variance Ratio F Test	1.848	23.15	0.5666	Equal Variances
Distribution	Anderson-Darling A2 Test	0.2844	3.878	0.6594	Normal Distribution
	D'Agostino Skewness Test	0.2127	2.576	0.8316	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1499	0.3025	0.9473	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9461	0.7411	0.6229	Normal Distribution

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	0.9543	0.9383	0.9702		0.9372	0.9686	0.0057	1.35%	0.00%
100		5	0.9659	0.9472	0.9846		0.9462	0.9821	0.0067	1.56%	-1.22%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3570	1.3190	1.3950		1.3180	1.3930	0.0138	2.27%	0.00%
100		5	1.3890	1.3370	1.4410		1.3370	1.4360	0.0187	3.01%	-2.35%

Combined Proportion Normal Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9552	0.9686	0.9641	0.9372
100		0.9552	0.9686	0.9776	0.9462	0.9821

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3370	1.3570	1.3930	1.3800	1.3180
100		1.3570	1.3930	1.4200	1.3370	1.4360

CETIS Analytical Report

Report Date: 02 Nov-21 11:43 (p 2 of 2)
Test Code/ID: WGR0921.060m / 18-0660-0583

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 05-1624-1213	Endpoint: Combined Proportion Normal	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:37	Analysis: Parametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:37	MD5 Hash: 4F685257C61FC36E6CFF35C0064860B5	Editor ID: 007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:43 (p 1 of 1)
 Test Code/ID: WGR0921.060m / 18-0660-0583

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-9719-5450	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:03	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:03	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 00-3490-9640	Code: WGR0921.060m	Project: 021.APC.01
Sample Date: 09 Sep-21 10:25	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-006
Sample Age: 6d 4h	Client: WGR Southwest Inc,	

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.1	8.829	11.37	10	10.2	0.07071	0.1414	1.40%	0
Overall		4	10.08	9.923	10.23	10	10.2	0.04787	0.09574	0.95%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.7	7.698	7.702	7.7	7.7	0	0	0.00%	0
Overall		4	7.8	7.616	7.984	7.7	7.9	0.05774	0.1155	1.48%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
Overall		4	34	34	34	34	34	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/R-95/136*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-007
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR0921.061

CHRONIC MYTILUS SEDIMENT WATER INTERFACE BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:43 (p 1 of 1)
Test Code/ID: WGR0921.061m / 01-7131-8640

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 06-2777-2564	Test Type: Development-Survival	Analyst: Joe Freas
Start Date: 15 Sep-21 14:04	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Water
Ending Date: 17 Sep-21 14:04	Species: Mytilus galloprovincialis	Brine:
Test Length: 48h	Taxon: Bivalvia	Source: Carlsbad Aquafarms CA Age:
Sample ID: 12-2403-5037	Code: WGR0921.061m	Project: 021.APC.01
Sample Date: 09 Sep-21 11:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-007
Sample Age: 6d 3h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-9959-2355	Combined Proportion Normal	Equal Variance t Two-Sample Test	0.7629	100% passed combined proportion normal	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
14-9959-2355	Combined Proportion Normal	PMSD	0.01962	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	0.9578	0.9357	0.9800	0.9372	0.9821	0.0080	0.0178	1.86%	0.00%
100		5	0.9659	0.9531	0.9787	0.9552	0.9821	0.0046	0.0103	1.07%	-0.84%

Combined Proportion Normal Detail

MD5: 781F590B87CAED4C0A38E692C769AE4D

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9686	0.9552	0.9821	0.9372
100		0.9641	0.9686	0.9552	0.9821	0.9596

Combined Proportion Normal Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	211/223	216/223	213/223	219/223	209/223
100		215/223	216/223	213/223	219/223	214/223

CETIS Analytical Report

Report Date: 02 Nov-21 11:43 (p 1 of 2)
 Test Code/ID: WGR0921.061m / 01-7131-8640

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	14-9959-2355	Endpoint:	Combined Proportion Normal	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:40	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:40	MD5 Hash:	781F590B87CAED4C0A38E692C769AE4D	Editor ID:	007-979-628-1
Batch ID:	06-2777-2564	Test Type:	Development-Survival	Analyst:	Joe Freas
Start Date:	15 Sep-21 14:04	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Water
Ending Date:	17 Sep-21 14:04	Species:	Mytilus galloprovincialis	Brine:	
Test Length:	48h	Taxon:	Bivalvia	Source:	Carlsbad Aquafarms CA
				Age:	
Sample ID:	12-2403-5037	Code:	WGR0921.061m	Project:	021.APC.01
Sample Date:	09 Sep-21 11:30	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-007
Sample Age:	6d 3h	Client:	WGR Southwest Inc.		

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed combined proportion normal endpoint	1.96%

Equal Variance t Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	-0.751	1.86	0.047	8	CDF	0.7629	Non-Significant Effect

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
PMSD	0.01962	<<	0.25	No	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0008937	0.0008937	1	0.564	0.4741	Non-Significant Effect
Error	0.0126759	0.0015845	8			
Total	0.0135696		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	1.361	11.26	0.2769	Equal Variances
	Mod Levene Equality of Variance Test	1.215	13.75	0.3125	Equal Variances
	Variance Ratio F Test	2.388	23.15	0.4198	Equal Variances
Distribution	Anderson-Darling A2 Test	0.3202	3.878	0.5541	Normal Distribution
	D'Agostino Skewness Test	1.016	2.576	0.3098	Normal Distribution
	Kolmogorov-Smirnov D Test	0.1722	0.3025	0.6322	Normal Distribution
	Shapiro-Wilk W Normality Test	0.9471	0.7411	0.6338	Normal Distribution

Combined Proportion Normal Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	0.9578	0.9357	0.9800		0.9372	0.9821	0.0080	1.86%	0.00%
100		5	0.9659	0.9531	0.9787		0.9552	0.9821	0.0046	1.07%	-0.84%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.3680	1.3090	1.4270		1.3180	1.4360	0.0211	3.45%	0.00%
100		5	1.3870	1.3490	1.4250		1.3570	1.4360	0.0137	2.20%	-1.38%

Combined Proportion Normal Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	0.9462	0.9686	0.9552	0.9821	0.9372
100		0.9641	0.9686	0.9552	0.9821	0.9596

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.3370	1.3930	1.3570	1.4360	1.3180
100		1.3800	1.3930	1.3570	1.4360	1.3690

CETIS Analytical Report

Report Date: 02 Nov-21 11:43 (p 2 of 2)
Test Code/ID: WGR0921.061m / 01-7131-8640

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	14-9959-2355	Endpoint:	Combined Proportion Normal	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:40	Analysis:	Parametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:40	MD5 Hash:	781F590B87CAED4C0A38E692C769AE4D	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:43 (p 1 of 1)
 Test Code/ID: WGR0921.061m / 01-7131-8640

Mussel Shell Development Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	06-2777-2564	Test Type:	Development-Survival	Analyst:	Joe Freas
Start Date:	15 Sep-21 14:04	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Water
Ending Date:	17 Sep-21 14:04	Species:	Mytilus galloprovincialis	Brine:	
Test Length:	48h	Taxon:	Bivalvia	Source:	Carlsbad Aquafarms CA
				Age:	
Sample ID:	12-2403-5037	Code:	WGR0921.061m	Project:	021.APC.01
Sample Date:	09 Sep-21 11:30	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-007
Sample Age:	6d 3h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10	8.729	11.27	9.9	10.1	0.07072	0.1414	1.41%	0
Overall		4	10.03	9.873	10.18	9.9	10.1	0.04787	0.09574	0.96%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.75	7.115	8.385	7.7	7.8	0.03536	0.07072	0.91%	0
Overall		4	7.825	7.673	7.977	7.7	7.9	0.04787	0.09574	1.22%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	34	34	34	34	34	0	0	0.00%	0
100		2	34	34	34	34	34	0	0	0.00%	0
Overall		4	34	34	34	34	34	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-003
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR1021.057

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.057e / 04-5769-0552

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 08-2094-1543	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age;
Sample ID: 12-5715-2191	Code: WGR0921.057e	Project: 021.APC.01
Sample Date: 09 Sep-21 17:55	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-003
Sample Age: 11d 19h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
10-8487-0012	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
10-8487-0012	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

 Report Date: 02 Nov-21 11:44 (p 1 of 2)
 Test Code/ID: WGR0921.057e / 04-5769-0552

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 10-8487-0012	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:10	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:09	MD5 Hash: 41B41182B59AAABFB2FDAA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 08-2094-1543	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 12-5715-2191	Code: WGR0921.057e	Project: 021.APC.01
Sample Date: 09 Sep-21 17:55	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-003
Sample Age: 11d 19h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	—	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 2 of 2)
Test Code/ID: WGR0921.057e / 04-5769-0552

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	10-8487-0012	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:10	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:09	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.057e / 04-5769-0552

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 08-2094-1543	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 12-5715-2191	Code: WGR0921.057e	Project: 021.APC.01
Sample Date: 09 Sep-21 17:55	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-003
Sample Age: 11d 19h	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.3	7.759	12.84	10.1	10.5	0.1414	0.2828	2.75%	0
Overall		4	10.18	9.822	10.53	10	10.5	0.1109	0.2217	2.18%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.75	7.115	8.385	7.7	7.8	0.03536	0.07072	0.91%	0
100		2	7.65	7.015	8.285	7.6	7.7	0.03535	0.07071	0.92%	0
Overall		4	7.7	7.57	7.83	7.6	7.8	0.04082	0.08165	1.06%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

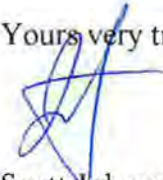
We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-004
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR1021.058

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


u Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.058e / 07-4874-5125

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-5334-1084	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:01	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:01	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 05-2535-3705	Code: WGR0921.058e	Project: 021.APC.01
Sample Date: 09 Sep-21 13:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-004
Sample Age: 12d	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-0962-2660	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
11-0962-2660	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 1 of 2)
Test Code/ID: WGR0921.058e / 07-4874-5125

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 11-0962-2660	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:13	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:12	MD5 Hash: 41B41182B59AAABFB2FDA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 07-5334-1084	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:01	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:01	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 05-2535-3705	Code: WGR0921.058e	Project: 021.APC.01
Sample Date: 09 Sep-21 13:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-004
Sample Age: 12d	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	---	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 2 of 2)
Test Code/ID: WGR0921.058e / 07-4874-5125

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	11-0962-2660	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:13	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:12	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.058e / 07-4874-5125

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-5334-1084	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:01	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:01	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 05-2535-3705	Code: WGR0921.058e	Project: 021.APC.01
Sample Date: 09 Sep-21 13:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-004
Sample Age: 12d	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.05	8.144	11.96	9.9	10.2	0.1061	0.2121	2.11%	0
Overall		4	10.05	9.845	10.26	9.9	10.2	0.06455	0.1291	1.29%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.65	7.015	8.285	7.6	7.7	0.03535	0.07071	0.92%	0
Overall		4	7.775	7.536	8.014	7.6	7.9	0.075	0.15	1.93%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-005
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR1021.059

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00

EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.059e / 16-3717-3859

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 02-7155-0715	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:02	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:02	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 17-6438-0700	Code: WGR0921.059e	Project: 021.APC.01
Sample Date: 09 Sep-21 15:45	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 11d 21h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-1073-9707	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
19-1073-9707	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 1 of 2)
Test Code/ID: WGR0921.059e / 16-3717-3859

Eohaustorius 10-d Survival and Reburial Sediment Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	19-1073-9707	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:16	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:16	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1
Batch ID:	02-7155-0715	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	21 Sep-21 13:02	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	01 Oct-21 13:02	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	17-6438-0700	Code:	WGR0921.059e	Project:	021.APC.01
Sample Date:	09 Sep-21 15:45	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-005
Sample Age:	11d 21h	Client:	WGR Southwest Inc.		

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test									
Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	---	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria					
TAC Limits					
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary											
Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail						
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail						
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 2 of 2)
Test Code/ID: WGR0921.059e / 16-3717-3859

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-1073-9707	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:16	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:16	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

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z

CETIS Measurement Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.059e / 16-3717-3859

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 02-7155-0715	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:02	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:02	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 17-6438-0700	Code: WGR0921.059e	Project: 021.APC.01
Sample Date: 09 Sep-21 15:45	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 11d 21h	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.75	7.115	8.385	7.7	7.8	0.03536	0.07072	0.91%	0
Overall		4	7.825	7.673	7.977	7.7	7.9	0.04787	0.09574	1.22%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

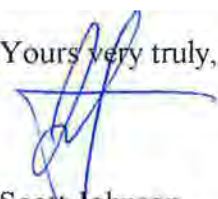
We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-006
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR1021.060

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


m Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.060e / 01-4298-0789

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-8930-3274	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:03	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:03	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 09-5071-1228	Code: WGR0921.060e	Project: 021.APC.01
Sample Date: 09 Sep-21 10:25	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-006
Sample Age: 12d 3h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-6872-9929	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.5000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
19-6872-9929	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		5	0.9900	0.9622	1.0180	0.9500	1.0000	0.0100	0.0224	2.26%	1.00%

Survival Rate Detail

MD5: 15A6E9300CFE050D39B6D7C56B2CBB62

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		0.9500	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		19/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 1 of 2)
 Test Code/ID: WGR0921.060e / 01-4298-0789

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-6872-9929	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:19	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:19	MD5 Hash:	15A6E9300CFE050D39B6D7C56B2CBB62	Editor ID:	007-979-628-1
Batch ID:	07-8930-3274	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	21 Sep-21 13:03	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	01 Oct-21 13:03	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	09-5071-1228	Code:	WGR0921.060e	Project:	021.APC.01
Sample Date:	09 Sep-21 10:25	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	13 Sep-21 16:00	CAS (PC):		Station:	SED-006
Sample Age:	12d 3h	Client:	WGR Southwest Inc.		

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed survival rate endpoint	2.36%

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	25	---	1	8	Exact	0.5000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0012877	0.0012877	1	1	0.3466	Non-Significant Effect
Error	0.0103014	0.0012877	8			
Total	0.0115891		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	7.111	11.26	0.0285	Equal Variances
	Mod Levene Equality of Variance Test	1	13.75	0.3559	Equal Variances
	Variance Ratio F Test				Indeterminate
Distribution	Anderson-Darling A2 Test	1.796	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Skewness Test	3.335	2.576	0.0009	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.4	0.3025	6.1E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.6247	0.7411	0.0001	Non-Normal Distribution

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	0.9900	0.9622	1.0000		0.9500	1.0000	0.0100	2.26%	1.00%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4360	1.3730	1.4990		1.3450	1.4590	0.0227	3.53%	1.56%

Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		0.9500	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.3450	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 02 Nov-21 11:44 (p 2 of 2)
Test Code/ID: WGR0921.060e / 01-4298-0789

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-6872-9929	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:19	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:19	MD5 Hash:	15A6E9300CFE050D39B6D7C56B2CBB62	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:44 (p 1 of 1)
Test Code/ID: WGR0921.060e / 01-4298-0789

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-8930-3274	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:03	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:03	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 09-5071-1228	Code: WGR0921.060e	Project: 021.APC.01
Sample Date: 09 Sep-21 10:25	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-006
Sample Age: 12d 3h	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.8	6.529	9.071	7.7	7.9	0.07071	0.1414	1.81%	0
Overall		4	7.85	7.691	8.009	7.7	7.9	0.05	0.1	1.27%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)



November 2, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-007
DATE RECEIVED:	9/13/2021
ABC LAB. NO.:	WGR1021.061

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00

EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 02 Nov-21 11:45 (p 1 of 1)
Test Code/ID: WGR0921.061e / 18-3199-4422

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 09-6416-4429	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:04	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:04	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 01-7535-3971	Code: WGR0921.061e	Project: 021.APC.01
Sample Date: 09 Sep-21 11:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-007
Sample Age: 12d 2h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-2868-0927	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
03-2868-0927	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 02 Nov-21 11:45 (p 1 of 2)
Test Code/ID: WGR0921.061e / 18-3199-4422

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 03-2868-0927	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 02 Nov-21 11:23	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 02 Nov-21 11:23	MD5 Hash: 41B41182B59AAABFB2FDAA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 09-6416-4429	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:04	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:04	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 01-7535-3971	Code: WGR0921.061e	Project: 021 APC.01
Sample Date: 09 Sep-21 11:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-007
Sample Age: 12d 2h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc.-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	---	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits		Overlap	Decision
		Lower	Upper		
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc.-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 02 Nov-21 11:45 (p 2 of 2)
Test Code/ID: WGR0921.061e / 18-3199-4422

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	03-2868-0927	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	02 Nov-21 11:23	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	02 Nov-21 11:23	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 02 Nov-21 11:45 (p 1 of 1)
Test Code/ID: WGR0921.061e / 18-3199-4422

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 09-6416-4429	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 21 Sep-21 13:04	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 01 Oct-21 13:04	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 01-7535-3971	Code: WGR0921.061e	Project: 021.APC.01
Sample Date: 09 Sep-21 11:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 13 Sep-21 16:00	CAS (PC):	Station: SED-007
Sample Age: 12d 2h	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.1	8.829	11.37	10	10.2	0.07071	0.1414	1.40%	0
Overall		4	10.08	9.923	10.23	10	10.2	0.04787	0.09574	0.95%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.65	7.015	8.285	7.6	7.7	0.03535	0.07071	0.92%	0
Overall		4	7.775	7.536	8.014	7.6	7.9	0.075	0.15	1.93%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
100		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
Overall		4	14.85	14.76	14.94	14.8	14.9	0.02887	0.05773	0.39%	0 (0%)

Facility Name	LA Refinery - Carson Operations
Facility Contact	Nate Busch

City, State (Facility)	1801 E. Sepulveda Blvd., Carson CA 90749
Facility Telephone No.	(310) 847-3920

Project Manager (Consultant)	Chelsea Dreyer
Telephone No. (Consultant)	(562) 799-8510 ex. 1003

Project No. (Consultant)
021.APC.01

Fax No. (Consultant)
(562) 799-8510

Laboratory Name
Aquatic Bioassay
29 N Olive Street
Ventura 93001
(805) 643-5621

Consultant Company
WGR Southwest, Inc.

Consultant Address
11021 Winners Circle #101 Los Alamitos, California 90720

[illegible]

Duplicate samples must be analyzed at a frequency of 5%

Special QA/QC

Sub'd COC Attch'd:	
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	R	E	M	A	R	K
--	---	---	---	---	---	---

Email Results to:
mbusch@marathonpetroleum.com
cdreyer@wgr-sw.com
aballrot@wgr-sw.com

Sample Received Intact:	Yes	No
-------------------------	-----	----

Temperature received:	Ice	No ice
-----------------------	-----	--------

Relinquished by **SAMPLER** (Print & Sign Name)

Date	Time
9/13/21	11:40

Received by (Print & Sign Name)

Relinquished by (Print & Sign Name)

Date	Time
------	------

Received by **LABORATORY** (Print & Sign Name)

Lab Work No.



96 Hour *Eohaustorius estuarius* Survival Bioassay - Standard Toxicant

DATE: 9/21/2021

STANDARD TOXICANT: Ammonium Chloride

ENDPOINT: SURVIVAL

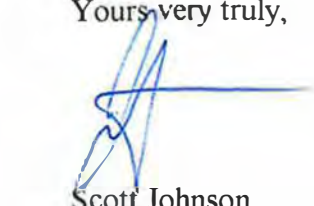
UNIONIZED AMMONIA

NOEC = 0.4520mg/L

EC25 = 0.8060mg/L

EC50 = 1.4720mg/L

Yours very truly,



Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 01 Dec-21 14:44 (p 1 of 1)
Test Code/ID: EOH092121 / 00-8890-2246

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 10-6174-3219	Test Type: Survival	Analyst: Joe Freas
Start Date: 21 Sep-21 15:50	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 25 Sep-21 16:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 4d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 03-7921-4314	Code: EOH092121	Project: REF TOX
Sample Date: 21 Sep-21	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: 16h	Client: Internal Lab	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	PMSD	S
09-8125-8804	Survival Rate	Steel Many-One Rank Sum Test		0.452	0.806	0.6036	9.58%	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	mg/L	95% LCL	95% UCL	S
17-7232-1622	Survival Rate	Linear Interpolation (ICPIN)		EC10	0.57	0.4621	0.6644	1
				EC15	0.6487	0.5767	0.7588	
				EC20	0.7273	0.6472	0.8532	
				EC25	0.806	0.703	0.9907	
				EC40	1.206	0.9511	1.574	
				EC50	1.472	1.099	2.061	

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
0.227		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
0.452		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
0.806		4	0.7500	0.6581	0.8419	0.7000	0.8000	0.0289	0.0577	7.70%	25.00%
1.672		4	0.4250	0.1532	0.6968	0.2000	0.6000	0.0854	0.1708	40.18%	57.50%
3.524		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

Survival Rate Detail

MD5: 6D7744C2167F10E7961AD3841CCD9839

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
0.227		1.0000	1.0000	1.0000	1.0000
0.452		1.0000	0.9000	1.0000	1.0000
0.806		0.8000	0.8000	0.7000	0.7000
1.672		0.6000	0.5000	0.2000	0.4000
3.524		0.0000	0.0000	0.0000	0.0000

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	10/10	10/10	10/10	10/10
0.227		10/10	10/10	10/10	10/10
0.452		10/10	9/10	10/10	10/10
0.806		8/10	8/10	7/10	7/10
1.672		6/10	5/10	2/10	4/10
3.524		0/10	0/10	0/10	0/10

CETIS Analytical Report

Report Date: 01 Dec-21 14:44 (p 1 of 2)
Test Code/ID: EOH092121 / 00-8890-2246

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 09-8125-8804	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 01 Dec-21 14:43	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 01 Dec-21 14:40	MD5 Hash: 6D7744C2167F10E7961AD3841CCD9839	Editor ID: 007-979-628-1
Batch ID: 10-6174-3219	Test Type: Survival	Analyst: Joe Freas
Start Date: 21 Sep-21 15:50	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 25 Sep-21 16:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 4d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 03-7921-4314	Code: EOH092121	Project: REF TOX
Sample Date: 21 Sep-21	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: 16h	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	0.452	0.806	0.6036	---	0.09578	9.58%

Steel Many-One Rank Sum Test

Control	vs	Conc-mg/L	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		0.227	18	10	1	6	CDF	0.8000	Non-Significant Effect
		0.452	16	10	1	6	CDF	0.5661	Non-Significant Effect
		0.806*	10	10	0	6	CDF	0.0350	Significant Effect
		1.672*	10	10	0	6	CDF	0.0350	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.54617	0.386544	4	44.16	<1.0E-05	Significant Effect
Error	0.131289	0.0087526	15			
Total	1.67746		19			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	5.095	4.893	0.0085	Unequal Variances
	Mod Levene Equality of Variance Test	3.277	4.893	0.0405	Equal Variances
Distribution	Anderson-Darling A2 Test	1.291	3.878	0.0020	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.439	2.576	0.0147	Normal Distribution
	D'Agostino Skewness Test	1.825	2.576	0.0680	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	9.278	9.21	0.0097	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.25	0.2235	0.0020	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8745	0.866	0.0141	Normal Distribution

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
0.227		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
0.452		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
0.806		4	0.7500	0.6581	0.8419	0.7500	0.7000	0.8000	0.0289	7.70%	25.00%
1.672		4	0.4250	0.1532	0.6968	0.4500	0.2000	0.6000	0.0854	40.18%	57.50%
3.524		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
0.227		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
0.452		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
0.806		4	1.0490	0.9426	1.1560	1.0490	0.9912	1.1070	0.0335	6.38%	25.70%
1.672		4	0.7050	0.4175	0.9924	0.7351	0.4636	0.8861	0.0903	25.63%	50.07%
3.524		4	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0.0000	0.00%	88.76%

CETIS Analytical Report

Report Date: 01 Dec-21 14:44 (p 2 of 2)
Test Code/ID: EOH092121 / 00-8890-2246

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 09-8125-8804 Endpoint: Survival Rate CETIS Version: CETISv1.9.7
Analyzed: 01 Dec-21 14:43 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 01 Dec-21 14:40 MD5 Hash: 6D7744C2167F10E7961AD3841CCD9839 Editor ID: 007-979-628-1

Survival Rate Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
0.227		1.0000	1.0000	1.0000	1.0000
0.452		1.0000	0.9000	1.0000	1.0000
0.806		0.8000	0.8000	0.7000	0.7000
1.672		0.6000	0.5000	0.2000	0.4000
3.524		0.0000	0.0000	0.0000	0.0000

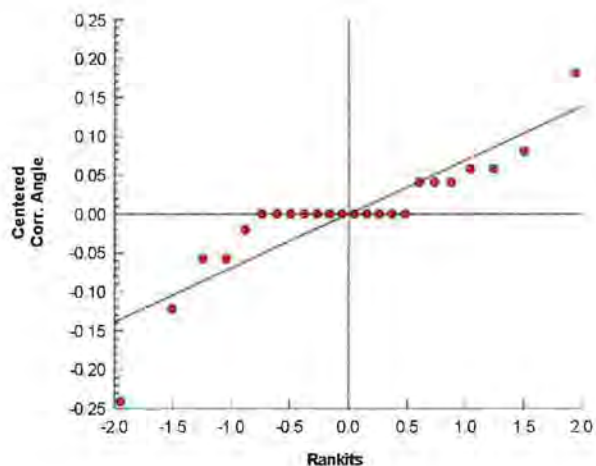
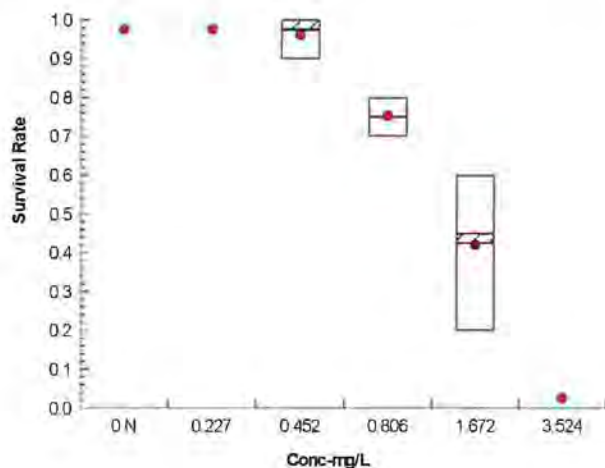
Angular (Corrected) Transformed Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4120	1.4120	1.4120	1.4120
0.227		1.4120	1.4120	1.4120	1.4120
0.452		1.4120	1.2490	1.4120	1.4120
0.806		1.1070	1.1070	0.9912	0.9912
1.672		0.8861	0.7854	0.4636	0.6847
3.524		0.1588	0.1588	0.1588	0.1588

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	10/10	10/10	10/10	10/10
0.227		10/10	10/10	10/10	10/10
0.452		10/10	9/10	10/10	10/10
0.806		8/10	8/10	7/10	7/10
1.672		6/10	5/10	2/10	4/10
3.524		0/10	0/10	0/10	0/10

Graphics



CETIS Analytical Report

Report Date: 01 Dec-21 14:44 (p 1 of 2)
Test Code/ID: EOH092121 / 00-8890-2246

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 17-7232-1622	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 01 Dec-21 14:43	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 01 Dec-21 14:40	MD5 Hash: 6D7744C2167F10E7961AD3841CCD9839	Editor ID: 007-979-628-1
Batch ID: 10-6174-3219	Test Type: Survival	Analyst: Joe Freas
Start Date: 21 Sep-21 15:50	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 25 Sep-21 16:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 4d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 03-7921-4314	Code: EOH092121	Project: REF TOX
Sample Date: 21 Sep-21	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: 16h	Client: Internal Lab	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	mg/L	95% LCL	95% UCL
EC10	0.57	0.4621	0.6644
EC15	0.6487	0.5767	0.7588
EC20	0.7273	0.6472	0.8532
EC25	0.806	0.703	0.9907
EC40	1.206	0.9511	1.574
EC50	1.472	1.099	2.061

Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
0.227		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
0.452		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9750	2.50%
0.806		4	0.7500	0.7500	0.7000	0.8000	7.70%	25.00%	30/40	0.7500	25.00%
1.672		4	0.4250	0.4500	0.2000	0.6000	40.18%	57.50%	17/40	0.4250	57.50%
3.524		4	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/40	0.0000	100.00%

Survival Rate Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
0.227		1.0000	1.0000	1.0000	1.0000
0.452		1.0000	0.9000	1.0000	1.0000
0.806		0.8000	0.8000	0.7000	0.7000
1.672		0.6000	0.5000	0.2000	0.4000
3.524		0.0000	0.0000	0.0000	0.0000

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	10/10	10/10	10/10	10/10
0.227		10/10	10/10	10/10	10/10
0.452		10/10	9/10	10/10	10/10
0.806		8/10	8/10	7/10	7/10
1.672		6/10	5/10	2/10	4/10
3.524		0/10	0/10	0/10	0/10

CETIS Analytical Report

Report Date: 01 Dec-21 14:44 (p 2 of 2)

Test Code/ID: EOH092121 / 00-8890-2246

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 17-7232-1622

Endpoint: Survival Rate

CETIS Version: CETISv1.9.7

Analyzed: 01 Dec-21 14:43

Analysis: Linear Interpolation (ICPIN)

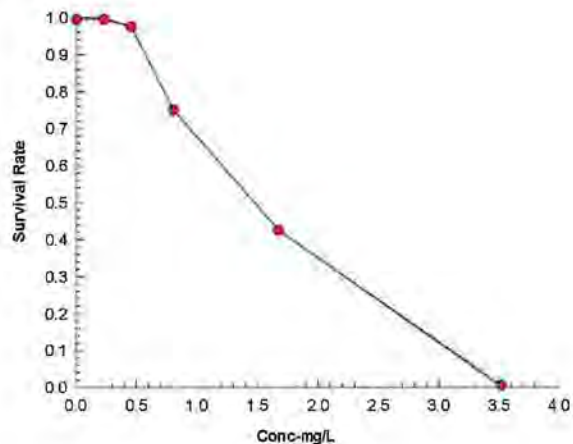
Status Level: 1

Edit Date: 01 Dec-21 14:40

MD5 Hash: 6D7744C2167F10E7961AD3841CCD9839

Editor ID: 007-979-628-1

Graphics



CETIS Measurement Report

Report Date: 01 Dec-21 14:44 (p 1 of 1)

Test Code/ID: EOH092121 / 00-8890-2246

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 10-6174-3219	Test Type: Survival	Analyst: Joe Freas
Start Date: 21 Sep-21 15:50	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 25 Sep-21 16:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 4d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 03-7921-4314	Code: EOH092121	Project: REF TOX
Sample Date: 21 Sep-21	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date:	CAS (PC):	Station: REF TOX
Sample Age: 16h	Client: Internal Lab	

Dissolved Oxygen-mg/L

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	6.55	5.915	7.185	6.5	6.6	0.03535	0.0707	1.08%	0
0.227		2	6.7	5.429	7.971	6.6	6.8	0.07071	0.1414	2.11%	0
0.452		2	6.7	4.159	9.241	6.5	6.9	0.1414	0.2828	4.22%	0
0.806		2	6.5	5.229	7.771	6.4	6.6	0.07071	0.1414	2.18%	0
1.672		2	6.5	6.5	6.5	6.5	6.5	0	0	0.00%	0
3.524		2	6.55	5.915	7.185	6.5	6.6	0.03535	0.0707	1.08%	0
Overall		12	6.583	6.494	6.673	6.4	6.9	0.04051	0.1403	2.13%	0 (0%)

pH-Units

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
0.227		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
0.452		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
0.806		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
1.672		2	7.8	7.787	7.813	7.8	7.8	0	0	0.00%	0
3.524		2	7.8	7.787	7.813	7.8	7.8	0	0	0.00%	0
Overall		12	7.867	7.835	7.898	7.8	7.9	0.01421	0.04924	0.63%	0 (0%)

Salinity-ppt

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
0.227		2	20	20	20	20	20	0	0	0.00%	0
0.452		2	20	20	20	20	20	0	0	0.00%	0
0.806		2	20	20	20	20	20	0	0	0.00%	0
1.672		2	20	20	20	20	20	0	0	0.00%	0
3.524		2	20	20	20	20	20	0	0	0.00%	0
Overall		12	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.95	14.31	15.59	14.9	15	0.03538	0.07075	0.47%	0
0.227		2	15	15	15	15	15	0	0	0.00%	0
0.452		2	14.85	14.21	15.49	14.8	14.9	0.03539	0.07077	0.48%	0
0.806		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
1.672		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
3.524		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
Overall		12	14.92	14.88	14.95	14.8	15	0.01667	0.05774	0.39%	0 (0%)

ATTACHMENT 5

ORGANIC/INORGANIC ANALYTICAL VALIDATION REPORT

**Tesoro Refining & Marketing LLC
Los Angeles Refinery – Carson Operations
Organic/Inorganic Analytical Validation Report**

Table of Contents

1.0	Overview	1
1.1	Data Assessment	2
1.2	Overall Data Review Narrative	3

Attachments:

Attachment I - Dominguez Channel Estuary Sediment Monitoring Inorganic/Organic Analytical
Validation Form

1.0 Overview

On behalf of Tesoro Refining & Marketing Company LLC, Los Angeles Refinery – Carson Operations (herein facility), WGR Southwest, Inc. (WGR) collected sediment samples at monitoring locations SED-003, SED-004, SED-005, SED-006, and SED-007 on September 9, 2021. Collected samples were submitted to the laboratory on September 13, 2021 for analysis as required in NPDES Permit No. CA0000680 Attachment E, Table E-7.

Sediment monitoring analysis was performed by laboratories certified under the Environmental Laboratory Accreditation Program (ELAP). Sediment chemistry samples were analyzed by Eurofins Calscience, Inc. in Garden Grove California with ELAP accreditation number 2944 and chronic toxicity samples were submitted to Aquatic Bioassay and Consulting Laboratories, Inc. in Ventura, California with ELAP accreditation number 1907. This document presents the analytical validation criteria used to determine the usability of data gathered as result of the sediment monitoring conducted. Analytical data was evaluated based on the validation criteria set forth in the *National Functional Guidelines for Organic Superfund Methods Data Review*, document number USEPA-540-R-2017-002, January 2017, and the *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, document number USEPA 540-R-2017-001, January 2017, as applied to the reported methodology. Sediment monitoring parameters, including the sample type and corresponding analytical method, are listed in Table 1.0 below.

Table 1.0 - Sediment Monitoring Parameters		
Parameters	Sample Type	Analytical Method
Cadmium, Total Recoverable	Surface Grab	EPA 6020B
Chlordane	Surface Grab	EPA 8081A
Chromium, Total	Surface Grab	EPA 6020B
Copper, Total Recoverable	Surface Grab	EPA 6020B
Lead, Total Recoverable	Surface Grab	EPA 6020B
Mercury, Total Recoverable	Surface Grab	EPA 7471A
Nickel, Total Recoverable	Surface Grab	EPA 6020B
Zinc, Total Recoverable	Surface Grab	EPA 6020B
PCBs ¹	Surface Grab	EPA 8082A
Sediment Grain Size	Surface Grab	ASTM D4464
Chronic Toxicity	Surface Grab	-
Pesticides	Surface Grab	EPA 8081A
Total Organic Carbon	Surface Grab	EPA 9060A

Table 1.0 - Sediment Monitoring Parameters		
Total Petroleum Hydrocarbons ²	Surface Grab	EPA 8015B
Tributyltin	Surface Grab	Krone et. Al.
Polynuclear Aromatic Hydrocarbons ³	Surface Grab	EPA 8270C
Footnotes: 1 – PCBs is the sum of Arochlor-1016, Arochlor-1221, Arochlor-1232, Arochlor-1242, Arochlor-1248, Arochlor-1254, and Arochlor-1260. 2 – DDT is the sum of 4,4' DDT, 2,4' DDT, 4,4' DDE, 2,4' DDE, 4,4' DDD, and 2,4' DDD 3 – PAHs is the sum of acenaphthene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo(k)fluoranthene, 1,12-benzoperylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, and pyrene.		

Analytical laboratory reports are included in Attachment 3 and Attachment 4 of the Dominguez Channel Estuary September 2021 Sediment Monitoring Report. All of the sediment monitoring parameters listed in Table 1.0 were analytically validated except for Sediment Grain Size and Chronic Toxicity. Data from these analyses do not qualify for environmental data validation guidance procedures. As a result, sediment grain size and chronic toxicity data was assessed for completion using Chain of Custody records and field sample preservation guidelines. Detailed analytical validation for chronic toxicity is provided in the Sediment Bioassay Data Validation Report in Attachment 6 of the Dominguez Channel Estuary September 2021 Sediment Monitoring Report.

Analytical data validation for organic/inorganic parameters determinations are included in the *Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form* in Attachment I included in this report.

1.1 Data Assessment

Analytical data validation consisted of evaluating laboratory precision, laboratory accuracy, method compliance, and overall completeness of laboratory data provided. Based on this assessment, it was determined that data obtained for the September 9, 2021 sediment samples at SED-003, SED-004, SED-005, SED-006, and SED-007 is acceptable. Data components reviewed during the data review process included:

- Chain of Custody records and holding times
- Sample integrity/case narratives
- Sample results, reporting limits, dilution factors
- Laboratory QA/QC data

A summary of the sediment samples collected are provided in Table 2.0 below:

Table 2.0 – Dominguez Channel Sediment Samples			
Sample ID	Sample Date	Sample Time	Laboratory ID
SED-003	September 9, 2021	17:55	570-69878-1
SED-004	September 9, 2021	13:30	570-69878-2
SED-005	September 9, 2021	15:45	570-69878-3
SED-006	September 9, 2021	10:25	570-69878-4
SED-007	September 9, 2021	11:30	570-69878-5

1.2 Overall Data Review Narrative

Analytical data was assessed for precision, accuracy, method compliance and overall completeness. Data review determined these components to be acceptable. However, as noted in the attached data validation form, the Matrix Spike (MS)/Matrix Spike Duplicate (MSD) recoveries in QA/QC samples for PAHs, organotins, and metals were outside the control limits. Since associated Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicates (LCSD) recoveries were within acceptance limits, the data was qualified and deemed acceptable.

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Attachment I

Dominguez Channel Estuary Sediment Monitoring Inorganic/Organic Analytical Validation Form

Tesoro Refining & Marketing LLC
Los Angeles Refinery - Carson Operations
Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form

PROJECT INFORMATION

Project Name: Dominguez Channel Sediment Sampling
Analytical Laboratories: Eurofins Calscience, Inc.
 Aquatic Bioassays & Consulting Laboratories Inc.
Sample Collection Date: September 9, 2021
Sample Collection Locations: SED-003, SED-004, SED-005, SED-006, SED-007

Data Validator: Amber Ballrot
Validation Date: January 6, 2022
Signature: 

SEDIMENT MONITORING PARAMETERS

Parameters	Sample Type	Analytical Method	Holding Times	Parameter Validation Comments:
Cadmium, Total Recoverable	Surface Grab	EPA 6020B	180 days	All sediment monitoring parameters were analytically validated except for Sediment Grain Size and Chronic Toxicity. Data from these analyses do not qualify for environmental data validation guidance procedures. Grain size and chronic toxicity data was assessed for completion based on Chain of Custody records and field sample preservation procedures.
Chlordane	Surface Grab	EPA 8081A	14 days	
Chromium, Total	Surface Grab	EPA 6020B	180 days	
Copper, Total Recoverable	Surface Grab	EPA 6020B	180 days	
Lead, Total Recoverable	Surface Grab	EPA 6020B	180 days	
Mercury, Total Recoverable	Surface Grab	EPA 7471A	180 days	
Nickel, Total Recoverable	Surface Grab	EPA 6020B	180 days	
Zinc, Total Recoverable	Surface Grab	EPA 6020B	180 days	
PCBs	Surface Grab	EPA 8082A	14 days	
Sediment Grain Size	Surface Grab	ASTM D4464	-	
Chronic Toxicity	Surface Grab	-	-	
Pesticides	Surface Grab	EPA 8081A	14 days	
Total Organic Carbon	Surface Grab	EPA 9060A	28 days	
Total Petroleum Hydrocarbons	Surface Grab	EPA 8015B	14 days	
Tributyltin	Surface Grab	Krone et. Al.	14 days	
Polynuclear Aromatic Hydrocarbons	Surface Grab	EPA 8270C	14 days	

VALIDATION CRITERIA

1. Was the Chain of Custody (COC) form complete for all samples submitted?	☒ YES ☐ NO ☐ N/A	Comments: The Chain of Custody (COC) form submitted to the laboratory is complete. The COC includes sample location information, field parameter results, and laboratory personnel signatures denoting the date and time the samples were relinquished by the sampler and received by the laboratory.
2. Were ALL of the requested analyses specified in the COC completed by the laboratory?	☒ YES ☐ NO ☐ N/A	Comments: Laboratory analysis was performed in accordance with the methods requested in the COC.

Tesoro Refining & Marketing LLC Los Angeles Refinery - Carson Operations Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form		
3. Were samples received in good condition and appropriately preserved as required by each analysis?	☒ YES ☐ NO ☐ N/A	Comments: The samples were received by the laboratory on September 13, 2021. The samples arrived in good condition and were properly preserved. No sample receipt deficiencies were noted in the laboratory report Sample Job Narrative.
4. Were the reported analytical methods in compliance with the facility's NPDES permit and/or COC requests?	☒ YES ☐ NO ☐ N/A	Comments: All analytical methods were completed as requested in the COC and are in compliance with the facility's NPDES permit.
5. Were detection limits in accordance with the facility's NPDES permit or analytical method?	☒ YES ☐ NO ☐ N/A	Comments: The method detection limits and reporting limits were reported for each analytical method. Sediment results were primarily reported on a dry weight basis except for DDT analyzed by method 8081A and sediment particle size analyzed by method D4464. DDT and sediment particle size was reported on a wet weight basis.
6. Did the laboratory identify any deficiencies/non-conformances related to the analytical results?	☐ YES ☒ NO ☐ N/A	Comments: The Job Narrative included on page 4 of the laboratory report did not identify any deficiencies/non-conformances related to the analytical results; however, qualifiers for quality control samples are included.
7. Were sample holding times met?	☒ YES ☐ NO ☐ N/A	Comments: Sample holding times were met for all analytical methods. The analytical methods and the corresponding holding time is provided in the Sediment Monitoring Parameter Table above.

Tesoro Refining & Marketing LLC Los Angeles Refinery - Carson Operations Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form		
8. Were correct concentration units reported?	☒ YES ☐ NO ☐ N/A	Comments: Analytical results are reported in the correct concentration units required for sediment sample matrices. Results are reported in varying units as follows: dry weight results reported in mg/kg include PAHs analyzed by method EPA 8270C, TPH analyzed by method 8015B, total metals analyzed by method 6020, mercury analyzed by method 7471A and total organic carbon analyzed by method 9060A. Results reported in dry weight as ug/kg included PCBs analyzed by method 8082 and organotins. Results reported in wet weight as ug/kg included DDT analyzed by 8081A. This unit trend is consistent at all four sampling stations.
9. Were the reporting requirements for flagged data met?	☒ YES ☐ NO ☐ N/A	Comments: Reporting requirements for flagged data were met. Qualifiers included: J - result is less than RL but greater than or equal to MDL and the result is approximate value p - The %RPD between the primary and confirmation column/detector is >40%. The lower value was reported F1 - MS and/or MSD recovery is outside acceptance limits F2 - MS/MSD RPD exceeds control limits X - Surrogate recoveries exceed control limits
10. Does the laboratory report include results for only those constituents requested in the COC?	☐ YES ☒ NO ☐ N/A	Comments: The laboratory report includes results for the required parameters as included in Table E-7 of the NPDES Permit; however, the laboratory report includes 5 additional PAH results not requested in the COC at all four sampling stations. These additional PAHs include Acenaphthylene, 1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene, and Phenanthrene. Data for these parameters are not required and are therefore not accounted for in this data validation.

Tesoro Refining & Marketing LLC Los Angeles Refinery - Carson Operations Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form		
11. Were laboratory method blank samples free of target analyte contamination?	☒ YES ☐ NO ☐ N/A	Comments: Laboratory method blanks were free of target analyte for all parameters at all sampled stations.
12. Were instrument calibrations within method or data validation control limits?	☐ YES ☐ NO ☒ N/A	Comments: Instrument calibration data was not supplied in the analytical report and, therefore, not included in this analytical data validation analysis.
13. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	☐ YES ☐ NO ☒ N/A	Comments: Not applicable. Trip blanks, field blanks and/or equipment rinse blank samples were not collected for this project.
14. Were surrogate recoveries within control limits?	☒ YES ☐ NO ☐ N/A	Comments: Surrogate recoveries are within control limits at all sampling stations including surrogates used for PAHs (method 8279C), tributyltin (Krone et al), TPH (method 8015B), PCBs (method 8082), metals (method 6020) and total organic carbon (9060A).
15. Were laboratory control sample recoveries within control limits?	☒ YES ☐ NO ☐ N/A	Comments: Laboratory control sample recoveries were within acceptable control limits for all parameters.

Tesoro Refining & Marketing LLC Los Angeles Refinery - Carson Operations Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form		
16. Were Matrix Spike (MS) / Matrix Spike Duplicate (MSD) recoveries within control limits?	YES NO N/A ☐ ☒ ☐	Comments: The Matrix Spike (MS)/Matrix Spike Duplicate (MSD) recoveries were outside control limits for PAH, organotins, metals; however, as explained in the Job Narrative for laboratory report 570-69878-1, sample matrix interference and/or nonhomogeneity is suspected.
17. Were internal standards within method criteria for GC/MS sample analysis?	☐ YES ☐ NO ☒ N/A	Comments: Does not apply to this level of data validation. In addition, GC/MS internal standard data was not supplied in the analytical reports and was therefore not included in this data review.
18. Were 100% of the Electronic Data Deliverable (EDD) concentrations and reporting limits compared to the hardcopy data reports?	☐ YES ☐ NO ☒ N/A	Comments: No EDD was used for this project.

Tesoro Refining & Marketing LLC
Los Angeles Refinery - Carson Operations
Dominguez Channel Estuary Sediment Monitoring Organic/Inorganic Analytical Data Validation Form

PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT

Precision Determination: ☒ Acceptable ☐ Not Acceptable

Comments: Precision is the measure of variability of individual sample measurements. Laboratory precision was determined by examination of laboratory duplicate results. To evaluate laboratory duplicates for precision the Relative Percent difference (RPD) was used. RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. RPD precision measurements were compared to laboratory QC limits and it was determined that RPDs were within the RPD limits, except for PAHs, organotins, and meals. The associated laboratory control sample / laboratory sample duplicate for this parameter, however, was within acceptance limits. Therefore, data precision obtained for all analyzed parameters was determined to be acceptable.

Accuracy Determination: ☒ Acceptable ☐ Not Acceptable

Comments: Accuracy is the closeness of a measured result to an accepted reference value usually measured as percent recoveries. Laboratory accuracy is a measure of system bias measured by evaluating Lab Control Samples (LCS), Lab Control Sample Duplicate (LCSD), matrix spikes (MS) and/or matrix spike duplicates (MSD), and organic system monitoring compound surrogate percent recoveries (%Rs). Data validation assessments revealed all LCS/LCSD were within acceptable criteria. MS and MSD recoveries outside the acceptable range are reported in the Job Narrative of the laboratory report. Due to the LCS/LCSD meeting applicable criteria, data accuracy for analyzed parameters was determined to be acceptable.

Method Compliance Determination: ☒ Acceptable ☐ Not Acceptable

Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits and laboratory blanks per method specific requirements. Assessment of these factors is presented above in questions 1, 2, 3 and 4. Data validation determined method compliance to be acceptable.

Completeness Determination: ☒ Acceptable ☐ Not Acceptable

Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Project completeness was performed by evaluating COC records, laboratory analytical methods, and detection limits as well as sample data results and QC summary reports. Data assessment for the collected samples determined the overall data completeness to be acceptable.

ATTACHMENT 6

SEDIMENT BIOASSAY DATA VALIDATION REPORT

**Tesoro Refining & Marketing LLC
Los Angeles Refinery – Carson Operations
Sediment Bioassay Data Validation Report**

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Attachment:

Attachment I – Dominguez Channel Estuary Sediment Bioassay Data Validation Form

1.0 Chronic Toxicity Test Overview

On behalf of Tesoro Refining & Marketing Company LLC, Los Angeles Refinery – Carson Operations (herein facility), WGR Southwest, Inc. (WGR) collected sediment samples at monitoring locations SED-003, SED-004, SED-005, SED-006, and SED-007 as required in National Pollutant Discharge Elimination System (NPDES) No. CA0000680. Sediment samples for chronic toxicity testing were collected on September 8, 2021 and submitted to Aquatic Bioassay & Consulting Laboratories Inc. on September 13, 2021 for analysis. Aquatic Bioassay & Consulting Laboratories has Environmental Laboratory Accreditation Program (ELAP) Certification number 1907.

In accordance with NPDES No. CA0000680 Attachment E, Section V.A.4, chronic toxicity samples are required to undergo a species sensitivity screening by concurrently conducting three toxicity tests using the fish, invertebrate and alga species listed in the permit order. Based on the results of the species sensitivity screening, the single species exhibiting the highest percent effect is required to be used for routine monitoring during the permit cycle. The species listed in the permit order, however, are more commonly used to evaluate effluent chronic toxicity rather than sediment toxicity. Therefore, with laboratory staff and Regional Water Quality Control Board guidance, a species sensitivity screening was conducted for chronic toxicity samples from September 9, 2021 using *Eohaustorius estuarius* sediment species and *Mytilus galloprovincialis* sediment species. Sediment chronic toxicity samples were tested in accordance with the guidelines prescribed in Methods for Assessing the Toxicity of Sediment Associated Contaminants with Estuarine and Marine Amphipods, Methods EPA/600/R-94/025 and EPA R-95/136.

2.0 Data Review

A level 2 data verification protocol was used for bioassay validation. The level 2 data review compares bioassay testing holding conditions, test setup, test implementation, and test termination in accordance with bioassay protocols. As part of the level 2 data verification protocol the laboratory was expected to follow all internal quality control procedures as directed in the applicable analytical method. Outcome of the data review for each of the chronic toxicity tests performed is documented in the *Chronic Toxicity QA/QC Bioassay Data Validation Form* included in Attachment I of this report.

Sediment samples at Stations SED-003, SED-004, SED-005, SED-006, and SED-007 were collected on September 9, 2021 by WGR Southwest Inc. All collected samples were preserved as required and submitted to Aquatic Bioassay and Consulting Laboratories Inc. on September 13, 2021. Chronic toxicity tests for all five stations began on September 21, 2021 and concluded on October 1, 2021. A summary of data usability determinations for the chronic toxicity test performed are described in the following section.

3.0 *Eohaustorius estuarius* Chronic Toxicity Test

3.1 Sample Collection, Sample Preservation, Chain of Custody

Sediment samples for *E. estuarius* chronic toxicity testing were collected from Stations SED-003, SED-004, SED-005, SED-006, and SED-007 using an Eckman dredge sampler. Sampling equipment was decontaminated prior to use at each station to prevent cross contamination. Field samples were handled with care to minimize sediment disturbance and prevent the loss of sample integrity, chemical speciation and chemical equilibrium. Collected samples were maintained at 4°C and a Chain of Custody documenting the collected samples was completed and submitted to Aquatic Bioassay & Consulting Laboratories Inc. Chronic toxicity testing was initiated for all samples within the required 14-day holding time for sample collection and analysis. Document review of sample collection, sample preservation and Chain of Custody procedures was deemed acceptable and in compliance with the facility's Waste Discharge Requirements (WDRs).

3.2 Test Setup

Chronic toxicity testing with *E. estuarius* was completed in accordance with EPA method 600/R-94-025. Organisms used for testing were field collected and supplied by Northwestern Amphipod in Oregon. Amphipods ranging in 3-5 mm in size were used, with at least twenty organisms per replicate. Test setup review is provided in the bioassay data validation form attached to this document. Based on a review of laboratory test setup procedures, test set up procedure were deemed acceptable and in compliance with EPA method requirements.

3.3 Test Implementation

Test implementation for chronic toxicity testing with *E. estuarius* was completed in accordance with EPA method 600/R-94/025. Water quality measurements were recorded during the duration of the test and were found to be in the acceptable range as specified in the test protocol. Ranges for the water quality measurements are provided in the QA/QC Checklist of Attachment I. No abnormal conditions were observed throughout the duration of the test. Thus, the test implementation was determined to be acceptable and in compliance with EPA method requirements.

3.3.1 Test Acceptability Criteria

3.3.1.1 Reference Toxicant

The reference toxicant used during *E. estuarius* chronic toxicity testing was unionized ammonia. The length of the reference toxicant test was 96 hours. All reference toxicant testing was within the two standard deviation quality control limit meeting the

test acceptability criteria in compliance with EPA method requirements.

3.3.1.2 Negative Control Samples

Negative control samples demonstrated a 99% survival at all sample stations, which is above the 90% mean acceptability survival criteria. As a result, the negative control sample results are considered acceptable at all sampled stations and in compliance with EPA method requirements.

3.4 Reporting

Bioassay results were delivered in an acceptable laboratory report documenting a summary of water quality results, reference toxicity results, test results, statistical calculations and percent mortality. Additional information regarding test setup/test implementation procedures was provided by the laboratory to complete the QA/QC bioassay data validation form. Overall, the reporting component presenting chronic toxicity test results for *E. estuarius* was deemed acceptable.

3.5 Overall Data Usability

Review of laboratory data indicated chronic toxicity testing was performed in accordance with EPA method 600/R-94/025 as documented in Attachment I. Through the bioassay laboratory report and additional clarification from the laboratory, the bioassay test results at all sample stations was deemed acceptable and in compliance with EPA method requirements.

4.0 *Mytilus galloprovincialis* Chronic Toxicity Test

4.1 Sample Collection, Sample Preservation, Chain of Custody

Sediment samples for *M. galloprovincialis* chronic toxicity testing were collected from Stations SED-003, SED-004, SED-005, SED-006, and SED-007 using an Eckman dredge sampler. Sampling equipment was decontaminated prior to use at each station to prevent cross contamination. Field samples were handled with care to minimize sediment disturbance and prevent the loss of sample integrity, chemical speciation and chemical equilibrium. Collected samples were maintained at 4°C and a Chain of Custody documenting the collected samples was completed and submitted to Aquatic Bioassay & Consulting Laboratories Inc. Chronic toxicity testing was initiated for all samples within the required 14-day holding time for sample collection and analysis. Document review of sample collection, sample preservation and Chain of Custody procedures was deemed acceptable and in compliance with the facility's Waste Discharge Requirements (WDRs).

4.2 Test Setup

Chronic toxicity testing with *M. galloprovincialis* was completed in accordance with EPA method R-95/136. Organisms used for testing were cultured and supplied by Carlsbad Aquafarms. There was an even sex ratio of brood stock and at least twelve organisms per test. Test setup review is provided in the bioassay data validation form attached to this document. Based on a review of laboratory test setup procedures, test set up procedure were deemed acceptable and in compliance with EPA method requirements.

4.3 Test Implementation

Test implementation for chronic toxicity testing with *M. galloprovincialis* was completed in accordance with EPA method R-95/136. Water quality measurements were recorded during the duration of the test and were found to be in the acceptable range as specified in the test protocol. Ranges for the water quality measurements are provided in the QA/QC Checklist of Attachment I. No abnormal conditions were observed throughout the duration of the test. Thus, the test implementation was determined to be acceptable and in compliance with EPA method requirements.

4.3.1 Test Acceptability Criteria

4.3.1.1 Reference Toxicant

The reference toxicant used during *M. galloprovincialis* chronic toxicity testing was unionized ammonia. The length of the reference toxicant test was 48 hours. All reference toxicant testing was within the two standard deviation quality control limit meeting the test acceptability criteria in compliance with EPA method requirements.

4.3.1.2 Negative Control Samples

Negative control samples demonstrated a 99% survival at all sample stations, which is above the 90% mean acceptability survival criteria. As a result, the negative control sample results are considered acceptable at all sampled stations and in compliance with EPA method requirements.

4.4 Reporting

Bioassay results were delivered in an acceptable laboratory report documenting a summary of water quality results, reference toxicity results, test results, statistical calculations and percent mortality. Additional information regarding test setup/test implementation procedures was provided by the laboratory to complete the QA/QC bioassay data validation form. Overall, the reporting component

presenting chronic toxicity test results for *M. galloprovincialis* was deemed acceptable.

4.5 Overall Data Usability

Review of laboratory data indicated chronic toxicity testing was performed in accordance with EPA method R-95/136 as documented in Attachment I. Through the bioassay laboratory report and additional clarification from the laboratory, the bioassay test results at all sample stations was deemed acceptable and in compliance with EPA method requirements.

Attachment I

Dominguez Channel Estuary

Sediment Bioassay Data Validation Form

Tesoro Refining & Marketing LLC
Los Angeles Refinery - Carson Operations
Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation

PROJECT INFORMATION

Project Name:	Dominguez Channel Sediment Sampling		
Analytical Laboratory:	Aquatic Bioassays & Consulting Laboratories Inc.		
Laboratory Technician:	Joe Freas		
Sample Collection Date:	September 9, 2021		
Sample Locations/Lab Number:	Eohaustorius estuarius	SED-003 / WGR1021.057 SED-004 / WGR1021.058 SED-005 / WGR1021.059 SED-006 / WGR1021.060 SED-007 / WGR1021.061	
	Mytilus galloprovincialis	SED-003 / WGR0921.057 SED-004 / WGR0921.058 SED-005 / WGR0921.059 SED-006 / WGR0921.060 SED-007 / WGR0921.061	
Species/Test Method Referenced:	Eohaustorius estuarius EPA/600/R-94-025	Test Duration:	SED-003: September 21, 2021 @ 13: 00 - October 1, 2021 @13:00 (10 day) SED-004: September 21, 2021 @ 13: 01 - October 1, 2021 @13:01 (10 day) SED-005: September 21, 2021 @ 13: 02 - October 1, 2021 @13:02 (10 day) SED-006: September 21, 2021 @ 13: 03 - October 1, 2021 @13:03 (10 day) SED-007: September 21, 2021 @ 13: 04 - October 1, 2021 @13:04 (10 day)
	Mytilus galloprovincialis EPA/600/R-95-136	Test Duration:	SED-003: September 15, 2021 @ 14: 00 - September 17, 2021 @14:00 (48 hours) SED-004: September 15, 2021 @ 14: 01 - September 17, 2021 @14:01 (48 hours) SED-005: September 15, 2021 @ 14: 02 - September 17, 2021 @14:02 (48 hours) SED-006: September 15, 2021 @ 14: 03 - September 17, 2021 @14:03 (48 hours) SED-007: September 15, 2021 @ 14: 04 - September 17, 2021 @14:04 (48 hours)
Sample Matrix:	Sediment		
Type of Species:	Estuarine		
Data Validator:	Amber Ballrot		
Validation Date:	January 6, 2021		
Signature:			
Problems Noted:	No problems or deficiencies identified. Chronic toxicity testing was performed in accordance with EPA method guidelines.		

Tesoro Refining & Marketing LLC
Los Angeles Refinery - Carson Operations
Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation

EOHAUSTORIUS ESTUARIUS

Completeness and Holding Conditions:

Type of Samples Collected: Grab Sediment Samples	Number of Samples Analyzed: 5
Were samples maintained at 4°C and in the dark after collection? Yes	
Did chronic toxicity testing begin within 14 days of sample collection? Yes	
Holding conditions acceptable? Yes	
If holding conditions were not acceptable, explain: N/A	

Quality of Test Organism, Collection and Acclimation:

Who is the supplier of the test organisms?	Northwestern Amphipod in Newport, Oregon
Are organisms field collected or cultured?	Field Collected
If field collected:	
Where was the collection location? Newport, Oregon	
What was the organism collection date? Organism collection date was on 9/13/2021. Organisms were received by the laboratory on 9/15/2021.	
What was the water salinity and temperature at the time of collection? Water salinity at time of collection was 28 ppt and temperature was 14.2 °C. Organisms were acclimated at 26 ppt after collection and later, 24ppt and -2 ppt/day until reaching 20ppt.	
Was site sediment collected for holding an acclimation purposes? Yes, 2L of site sediment was collected and supplied to Aquatic Bioassay for negative control.	
Additional Comments: Quality of test organisms and acclimation is deemed acceptable.	

Field Collection Sorting Methods

Were healthy amphipods placed into 10 cm diameter finger bowls with 2 cm sieved site sediment and seawater of appropriate salinity? Yes, only healthy amphipods were used in testing. All sediment was sieved through stainless 2mm sieve. Overlying water of 20ppt was used for testing.
Were organisms held for 2-10 days? Yes, organisms were held for 6 days prior to testing.
Was test sediment sieved through 2 mm sieve or forceps for predator removal? Yes, sediment was sieved using a 2mm stainless sieve.
Was control sediment sieved twice through 0.5 mm? Yes
Did control sediment have a 4-hour settling period after each sieving? Yes, control has a >4 hour settling period after each sieving.

Test Initiation

Was salinity adjusted in all testing chambers? Yes
Was overlying ammonia detected? No ammonia was detected on overlying water. MDL 0.1mg/L.
Were there at least 5 replicates per sample? Yes
Was there at least 20 animals per replicate? Yes
Were 1 liter glass containers with 10 cm diameters used for each test chamber? Yes, 1L wide mouth glass containers (10 cm dia.) were used in testing.
Was water in each test chamber aerated overnight before start and throughout the test? Aeration occurred at 1bbl/second throughout testing.

Tesoro Refining & Marketing LLC
Los Angeles Refinery - Carson Operations
Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation

Was the organism length between 3-5 mm during test initiation? Yes, organism length was checked using dial calipers and confirmed within 3-5mm at test initiation.

Was the overlying water volume 800 mL? Yes

Were there any water quality adjustments? Yes, water quality measurements were collected during the duration of the test and are provided in the corresponding laboratory report.

Test Implementation

Photoperiod for 24 hours? Continuous light was provided.

Was daily water quality monitoring conducted? Yes

What was the overlying daily temperature range (15°C)? The overlying daily temperature was maintained at 15°C.

Was the daily salinity range 20+/-1 ppt? Yes, salinity range 20ppt.

Was water renewal conducted? No, water remained static and was not renewed over the 10-day exposure period as required in the EPA method.

Was the overlying daily pH between 7 – 8 standard units? Yes

What was the overlying ammonia detection (ND)? All overlying water was screened for ammonia and results were ND <0.1 mg/L.

Were appropriate test changes used (1-liter glass containers with 10 cm diameter)? Yes, 1L wide mouth glass containers (10 cm dia.) were used in testing.

Was water in each test chamber aerated overnight before start and throughout the test? Yes, aeration occurred at 1bbl/ second throughout testing.

Did the water maintain at least more than 90% saturation of dissolved oxygen concentration? Yes

Test Results and Analysis

Were the number of amphipods reported for each replicate? Yes

Was the percent mortality reported for each replicate? Yes

Was the sample mean for survival reported? Yes, the mean control survival was 100%

QA/QC Samples

<i>Positive Control</i>	<i>Negative Control</i>
Length of reference toxicity test? 96 hours	Negative control response above 90% acceptability criteria? Yes
What reference toxicant was used? Unionized Ammonia	Mean control survival? 100%
Exposure concentrations? Exposure ammonia concentrations were 0, 15.6, 32.2, 62.5, 125.0, 250 mg/L	Did EC 50 fall within lab standards? Yes
Did EC 50 fall within lab standards? Yes	

Tesoro Refining & Marketing LLC
Los Angeles Refinery - Carson Operations
Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation

MYTILUS GALLOPROVINCIALIS

Completeness and Holding Conditions:

Type of Samples Collected? Grab Sediment Samples	Number of Samples Analyzed: 5
Were samples maintained at 4°C and < 2 weeks in darkness? Yes	
Did chronic toxicity testing begin within 14 days of sample collection? Yes	
Holding conditions acceptable? Yes	
If holding conditions were not acceptable, explain: N/A	

Organism Collection and Acclimation:

Who is the supplier of the test organisms? Carlsbad Aquafarms
Are organisms field collected or cultured? Cultured
Was there an even sex ratio of brood stock? Yes
Were organisms maintained at 15°C? Yes
Were organisms brushed to remove encrusting organisms? Yes, organisms were brushed upon arrival.

Test Initiation

Were at least 12 test organisms used per test? Yes, a batch of 40-60 were spawned.
Was spawning successful within the first 30 minutes of beginning spawning process? Yes, spawning was immediate.
If spawning was unsuccessful, were any stimulants (i.e.- algae) used to promote spawning?
Was temperature maintained at 20°C during spawning? Yes, spawning induction was 20 °C. Post spawning organisms are move back to a fresh dish at 15 °C.

Test Implementation

Was the photoperiod 16 hr. light/8 hr. darkness? Yes
Were appropriate 30 mL chamber used? Yes
Was initial water quality monitoring conducted? Yes
Did light intensity remain at ambient laboratory conditions? Yes
What was the temperature range of the water? Temperature remained 15±1 °C.
Did dissolved oxygen concentrations remain above 4 mg/l? Yes
Did salinity range 30 +/- 2 ppt? Salinity remained within 30±2ppt.
What reference toxicant was used? Unionized ammonia was used as the reference toxicant.
What were the concentrations used for the reference toxicant? Concentrations included 0.0, 2.0, 4.0, 6.0, 8.0 and 10.0 mg/L

Test Results and Analysis

Did mussel embryos show 50% survival in control vials? Yes
Did mussels show 90% normal shell development in surviving controls? Yes

QA/QC Samples

Was a percent MSD of <25% demonstrated? Yes

Dominguez Channel Estuary

November 2021

Sediment Monitoring Report

Prepared for:

Tesoro Refining & Marketing Company LLC
Los Angeles Refinery – Carson Operations
1801 East Sepulveda Boulevard
Carson, CA 90745

Prepared by:

WGR Southwest, Inc.
11021 Winners Circle, Suite 101
Los Alamitos, CA 90720

Date:

January 21, 2022

**TESORO REFINING & MARKETING COMPANY LLC
LOS ANGELES REFINERY – CARSON OPERATIONS
DOMINGUEZ CHANNEL ESTUARY SEDIMENT MONITORING REPORT 2021**

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Table 2.0:	Sediment Monitoring Field Observation and Analyses
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FIGURES

Figure 1:	Dominguez Channel Estuary Sediment Monitoring Locations
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ATTACHMENTS

Attachment 1:	Sediment Monitoring Field Logs
Attachment 2:	Sediment Monitoring Laboratory Result Summary Table
Attachment 3:	Sediment Monitoring Aquatic Bioassay Analytical Laboratory Report
Attachment 4:	Sediment Bioassay Data Validation Report

1.0 Introduction

On behalf of Tesoro Refining & Marketing Company LLC Los Angeles Refinery – Carson Operations (Tesoro LAR Carson), WGR Southwest, Inc. (WGR) conducted sediment monitoring of the Dominguez Channel Estuary in accordance with National Pollutant Discharge Elimination System Waste Discharge Requirements Permit Number CA0000680 Order Number R4-2015-0259 (WDR Permit). As required in Table E-7 of WDR Permit Attachment E, Monitoring and Reporting Program Number 5424 (MRP No. 5424), sediment monitoring is required at least once a year for all parameters and at least twice a year for Chronic Toxicity regardless of Tesoro LAR Carson discharge associated with the WDR Permit¹. Therefore, this report constitutes sediment monitoring for the second event of 2021, where the sediment samples collected were analyzed for Chronic Toxicity and required monitoring (i.e. field observations and field analyses) was completed.

2.0 Sediment Monitoring

As shown in Figure 1, the WDR Permit designates seven sediment monitoring locations: SED-001, SED-002, SED-003, SED-004, SED-005, SED-006, and SED-007. WGR field personnel utilized an Ekman dredge and a Horiba U-50 Series Multi-Parameter Meter. According to historic Tesoro LAR Carson Sediment Monitoring Reports, samplers have been unable to collect sediment samples from SED-001 since 2003 and SED-002 since 2003.

Sediment monitoring was attempted at all designated sediment monitoring locations on November 3, 2021. As detailed in the field logs (see Attachment 1), sediment samples and associated monitoring could only be feasibly completed at five of the seven sediment monitoring locations. Table 2.0 provides a summary of the field observations and analyses.

Table 2.0: Sediment Monitoring Field Observation and Analyses								
Sample ID	Field Observations			Field Analyses				
	Sediment Description	Biological Matter	Pollutants	pH (SU)	Salinity (PPT)	DO (mg/L)	SC (mS/Cm)	Turbidity (NTU)
SED-001	Not Sampled	Not Sampled	Not Sampled	--	--	--	--	--
SED-002	Not Sampled	Not Sampled	Not Sampled	--	--	--	--	--

¹ Tesoro LAR Carson did not discharge under the WDR Permit during the 2021 calendar year.

Table 2.0: Sediment Monitoring Field Observation and Analyses									
Sample ID	Field Observations			Field Analyses					
	Sediment Description	Biological Matter	Pollutants	pH (SU)	Salinity (PPT)	DO (mg/L)	SC (mS/Cm)	Turbidity (NTU)	Flow
SED-003	Dark in color with shell, vegetation and debris, biological odor	Vegetation present	Trash present	7.70	17.8	1.61	28.3	37.5	--
SED-004	Dark in color with shells, vegetation and debris, biological odor	Vegetation present	Trash present	7.37	10.9	12.59	18.2	42.4	--
SED-005	Dark in color with vegetation/debris and trash, biological odor	Vegetation present	Trash present	7.77	18.4	10.49	29.2	25.3	--
SED-006	Dark in color with vegetation/debris and trash, biological odor	Vegetation present	Trash present	8.09	22.8	12.21	35.3	17.0	--
SED-007	Dark in color with vegetation/debris and trash, biological odor	Vegetation present	Trash present	8.09	22.4	8.63	35.7	19.1	--
DO: Dissolved Oxygen									
SC: Specific Conductance									

3.0 Laboratory Results

Table 2.0 summarizes the field observations and analyses for the November 2021 sediment monitoring event. Laboratory results are summarized in Attachment 2. The Aquatic Bioassay laboratory report is in Attachment 3. A data validation report for this laboratory analytical report is in Attachment 4.

4.0 Executive Summary

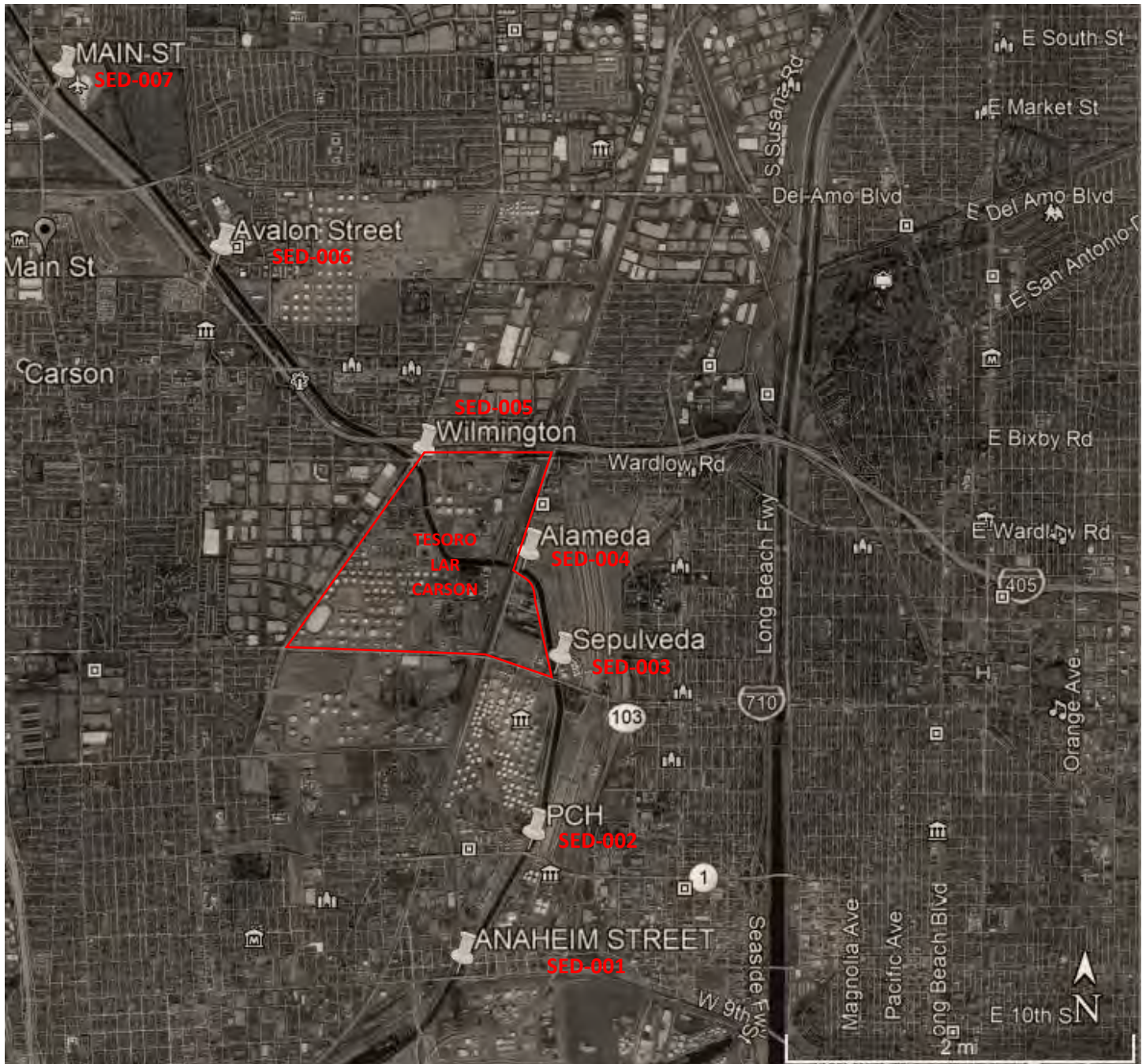
Receiving water sediment monitoring and analysis was conducted independent of any discharge from Tesoro LAR Carson. Pollutant concentrations demonstrated in this report are not associated with any contribution from Tesoro LAR Carson to the receiving water. There are

no pollutant concentration limits associated with this type of sampling as prescribed by the WDR Permit. Receiving water sediment monitoring and analysis was completed in compliance with the WDR Permit Attachment E, MRP No. 5424. As noted in the Sediment Bioassay Data Validation Report included in Attachment 4, analytical data obtained for this sampling event was deemed acceptable. No instances of non-compliance were identified.

FIGURE 1

DOMINGUEZ CHANNEL ESTUARY SEDIMENT MONITORING LOCATIONS

Figure 1: Dominguez Channel Estuary Sediment Monitoring Locations



ATTACHMENT 1

SEDIMENT MONITORING FIELD LOGS

WGR Southwest, Inc.		Page <u>1</u> of <u>2</u>
Field Log		Date: 11/3/2021
Project Name: LARC Sediment 2021		Field Personnel: David Montelongo
Project Number: 021.APC.01		Field Personnel: Karina Vega
Field Conditions/Project Discrepancies:		
Temperature: 55°F - 73°F		
Weather: Overcast - Partial Cloud Coverage, Smog		
Wind: Light Breeze		
Time	Field Notes	
9:00	Loaded Truck w/ Equipment, Safety Meeting & Job Overview at Office	
9:30	Arrived @ SED-007, Prepared Equipment for Sampling, Measured Distance from SE Corner of Bridge to Center: 102'. Measured distance from Bridge Railing to Water Surface: 23'. Water in Channel, White Film observed on Water Surface, Vegetation & Trash Along Embankment. Water is murky, unable to see bottom of Channel. Sediment was dark in color w/ some vegetation, seashells, and trash/debris. Sediment smells of bio-decomposition.	
	Horiba Meter Readings: 67°F, 8.09pH, -191 ORPmV, 35.7 mS/cm, 19.1 NTU, 8.63 mg/L DO, 21.8 g/L TDS, 22.4 ppt.	
10:50	Left SED-007 for SED-006	
11:00	Arrived @ SED-006, Measured Distance from NW Corner of Bridge to Center: 142'. Measured distance from Bridge Railing to Water Surface: 24'. Water in Channel, White Film observed on Water Surface, Vegetation & Trash Along Embankment. Water is murky, unable to see bottom of Channel. Sediment was dark in color w/ some vegetation, seashells, and trash/debris. Sediment smells of bio-decomposition.	
	Horiba Meter Readings: 69.6°F, 8.09pH, -70 ORPmV, 35.3 mS/cm, 17.0 NTU, 12.21 mg/L DO, 21.4 g/L TDS, 22.8 ppt.	
11:35	Left SED-006 for SED-005	
11:50	Arrived @ SED-005, Measured Distance from NE Corner of Bridge to Center: 164'. Measured distance from Bridge Railing to Water Surface: 23'. Water in Channel, White Film observed on Water Surface, Vegetation & Trash Along Embankment. Water is murky, unable to see bottom of Channel. Sediment was dark in color w/ some vegetation, seashells, and trash/debris. Sediment smells of bio-decomposition.	
	Horiba Meter Readings: 70.2°F, 7.77pH, -30 ORPmV, 29.2 mS/cm, 25.3 NTU, 10.49 mg/L DO, 16.8 g/L TDS, 18.4 ppt.	
12:45	Left SED-005 - Took Lunch	

WGR Southwest, Inc. Field Log		Page 2 of 2
		Date: 11/3/2021
Project Name: LARC Sediment 2021		Field Personnel: David Montelongo
Project Number: 021.APC.01		Field Personnel: Karina Vega
Field Conditions/Project Discrepancies: Temperature: 55°F - 73°F Weather: Overcast - Partial Cloud Coverage, Smog Wind: Light Breeze		
Time	Field Notes	
14:00	Arrived @ SED-004, Measured Distance from SE Corner of Bridge to Center: 89'. Measured distance from Bridge Railing to Water Surface: 23'. Water in Channel, White Film observed on Water Surface, Vegetation & Trash Along Embankment. Water is murky, unable to see bottom of Channel. Sediment was dark in color w/ some vegetation, seashells, and trash/debris. Sediment smells of bio-decomposition.	
	Horiba Meter Readings: 75.6°F, 7.37pH, 33 ORPmV, 18.2 mS/cm, 42.4 NTU, 12.59 mg/L DO, 10.1 g/L TDS, 10.9 ppt.	
15:15	Left SED-004	
15:20	Arrived @ SED-003, Measured Distance from NE Corner of Bridge to Center: 119'. Measured distance from Bridge Railing to Water Surface: 24'. Water in Channel, White Film observed on Water Surface, Vegetation & Trash Along Embankment. Water is murky, unable to see bottom of Channel. Sediment was dark in color w/ some vegetation, seashells, and trash/debris. Sediment smells of bio-decomposition.	
	Horiba Meter Readings: 72.3°F, 7.70pH, 24 ORPmV, 28.3 mS/cm, 37.5 NTU, 1.61 mg/L DO, 16.2 g/L TDS, 17.8 ppt.	
16:10	Left SED-003 for SED-002	
16:15	Drove past SED-002; Sample Point Inaccessible. Continued to SED-001	
16:25	Arrived at SED-001, Measured Distance from NE Corner of Bridge to Center: 920'. Measured Distance from Bridge Railing to Water Surface: 56'. Attempted Sediment Retrieval numerous times without success. Determined unable to sample SED-001. Returned to truck.	
17:00	Left SED-001. End of Day	

ATTACHMENT 2

SEDIMENT MONITORING LABORATORY RESULT SUMMARY TABLE

Sample ID	SED-001	SED-002	SED-003	SED-004	SED-005	SED-006	SED-007
Date Sampled	NS	NS	11/3/2021	11/3/2021	11/3/2021	11/3/2021	11/3/2021
Time Sampled	NS	NS	15:20	14:00	11:50	11:00	9:30
Total Metals							
Cadmium (EPA 6020) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Chromium (EPA 6020) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Copper (EPA 6020) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Lead (EPA 6020) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Nickel (EPA 6020) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Zinc (EPA 6020) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Mercury (EPA 7471A) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Volatile/Semi-Volatile Organic Compounds							
Chlordane (EPA 8081A) (ug/Kg)	NS	NS	NR	NR	NR	NR	NR
DDT (EPA 8081A) (ug/Kg, sum of 4,4'-DDT, 2,4'-DDT, 4,4'-DDE, 2,4'-DDE, 4,4'-DDD, and 2,4'-DDD)	NS	NS	NR	NR	NR	NR	NR
PCBs (EPA 8082) (ug/Kg, sum of Arochlor 1016, Arochlor 1221, Arochlor 1232, Arochlor 1242, Arochlor 1248, Arochlor 1254, and Arochlor 1260)	NS	NS	NR	NR	NR	NR	NR
PAHs (EPA 8270C) (mg/Kg, sum of acenaphthene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo(k)fluoranthene, 1,12-benzoperylene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, and pyrene)	NS	NS	NR	NR	NR	NR	NR
Total Petroleum Hydrocarbons (EPA 8015B) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Sediment Grain Size (ASTM D4464)	NR						
Total Organic Carbon (EPA 9060A) (mg/Kg)	NS	NS	NR	NR	NR	NR	NR
Tributyltin (Krone et al.) (ug/Kg)	NS	NS	NR	NR	NR	NR	NR
Chronic Toxicity							
Eohaustorius estuarius (NOEC in %)	NS	NS	100%	100%	100%	100%	100%

NS = Not Sampled

NR = Not Required

ND = Non-Detect

NOEC = No Observed Effect Concentration

ATTACHMENT 3

SEDIMENT MONITORING AQUATIC BIOASSAY ANALYTICAL LABORATORY REPORT



December 3, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-003
DATE RECEIVED:	11/4/2021
ABC LAB. NO.:	WGR1121.046

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 03 Dec-21 15:44 (p 1 of 1)
Test Code/ID: WGR1121.046 / 08-9912-3586

Eohaustorius 10-d Survival and Reburial Sediment Test				Aquatic Bioassay & Consulting Labs, Inc.			
Batch ID:	07-6098-5068	Test Type:	Survival-Reburial	Analyst:	Joe Freas		
Start Date:	09 Nov-21 13:00	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater		
Ending Date:	19 Nov-21 13:00	Species:	Eohaustorius estuarius	Brine:	Not Applicable		
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc	Age:	
Sample ID:	12-6755-9635	Code:	WGR1120.046	Project:	021.APC.01		
Sample Date:	03 Nov-21 15:20	Material:	Sediment	Source:	Bioassay Report		
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-003		
Sample Age:	5d 22h	Client:	WGR Southwest Inc.				

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-8811-6571	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
02-8811-6571	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 03 Dec-21 15:44 (p 1 of 2)

Test Code/ID: WGR1121.046 / 08-9912-3586

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 02-8811-6571	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 15:06	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 03 Dec-21 15:05	MD5 Hash: 41B41182B59AAABFB2FDAA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 07-6098-5068	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 09 Nov-21 13:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 19 Nov-21 13:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 12-6755-9635	Code: WGR1120.046	Project: 021.APC.01
Sample Date: 03 Nov-21 15:20	Material: Sediment	Source: Bioassay Report
Receipt Date: 04 Nov-21 16:00	CAS (PC):	Station: SED-003
Sample Age: 5d 22h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	—	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 03 Dec-21 15:44 (p 2 of 2)
Test Code/ID: WGR1121.046 / 08-9912-3586

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	02-8811-6571	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	03 Dec-21 15:06	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	03 Dec-21 15:05	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 03 Dec-21 15:44 (p 1 of 1)

Test Code/ID: WGR1121.046 / 08-9912-3586

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	07-6098-5068	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:00	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:00	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	12-6755-9635	Code:	WGR1120.046	Project:	021 APC.01
Sample Date:	03 Nov-21 15:20	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-003
Sample Age:	5d 22h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.7	7.698	7.702	7.7	7.7	0	0	0.00%	0
Overall		4	7.8	7.616	7.984	7.7	7.9	0.05774	0.1155	1.48%	0 (0%)

Salinity-ppt

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc.-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
Overall		4	14.75	14.66	14.84	14.7	14.8	0.02887	0.05774	0.39%	0 (0%)







December 3, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-004
DATE RECEIVED:	11/4/2021
ABC LAB. NO.:	WGR1121.047

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00

EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 03 Dec-21 15:44 (p 1 of 1)
Test Code/ID: WGR1121.047 / 13-8882-2314

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	19-2970-8862	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:01	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:01	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	18-3474-6730	Code:	WGR1121.047	Project:	021.APC.01
Sample Date:	03 Nov-21 14:00	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-004
Sample Age:	5d 23h	Client:	WGR Southwest Inc.		

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-4150-1788	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
00-4150-1788	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 03 Dec-21 15:44 (p 1 of 2)
Test Code/ID: WGR1121.047 / 13-8882-2314

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 00-4150-1788	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 15:13	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 03 Dec-21 15:12	MD5 Hash: 41B41182B59AAA8FB2FDAA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 19-2970-8862	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 09 Nov-21 13:01	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 19 Nov-21 13:01	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 18-3474-6730	Code: WGR1121.047	Project: 021.APC.01
Sample Date: 03 Nov-21 14:00	Material: Sediment	Source: Bioassay Report
Receipt Date: 04 Nov-21 16:00	CAS (PC):	Station: SED-004
Sample Age: 5d 23h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	---	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

TAC Limits

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 03 Dec-21 15:44 (p 2 of 2)
Test Code/ID: WGR1121.047 / 13-8882-2314

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	00-4150-1788	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	03 Dec-21 15:13	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	03 Dec-21 15:12	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 03 Dec-21 15:44 (p 1 of 1)

Test Code/ID: WGR1121.047 / 13-8882-2314

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	19-2970-8862	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:01	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:01	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	18-3474-6730	Code:	WGR1121.047	Project:	021.APC.01
Sample Date:	03 Nov-21 14:00	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-004
Sample Age:	5d 23h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.65	7.015	8.285	7.6	7.7	0.03535	0.07071	0.92%	0
Overall		4	7.775	7.536	8.014	7.6	7.9	0.075	0.15	1.93%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.8	13.53	16.07	14.7	14.9	0.07072	0.1414	0.96%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
Overall		4	14.77	14.62	14.93	14.7	14.9	0.04787	0.09574	0.65%	0 (0%)



December 3, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-005
DATE RECEIVED:	11/4/2021
ABC LAB. NO.:	WGR1121.048

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00

EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 03 Dec-21 15:44 (p 1 of 1)

Test Code/ID: WGR1121.048 / 19-4607-4273

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 18-0330-0744	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 09 Nov-21 13:02	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 19 Nov-21 13:02	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 07-2778-1040	Code: WGR1121.048	Project: 021.APC.01
Sample Date: 03 Nov-21 11:50	Material: Sediment	Source: Bioassay Report
Receipt Date: 04 Nov-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 6d 1h	Client: WGR Southwest Inc.	

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
02-8745-8391	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
02-8745-8391	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 03 Dec-21 15:44 (p 1 of 2)
Test Code/ID: WGR1121.048 / 19-4607-4273

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 02-8745-8391	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 15:35	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 03 Dec-21 15:34	MD5 Hash: 41B41182B59AAABFB2FDAA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 18-0330-0744	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 09 Nov-21 13:02	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 19 Nov-21 13:02	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 07-2778-1040	Code: WGR1121.048	Project: 021.APC.01
Sample Date: 03 Nov-21 11:50	Material: Sediment	Source: Bioassay Report
Receipt Date: 04 Nov-21 16:00	CAS (PC):	Station: SED-005
Sample Age: 6d 1h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	—	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 03 Dec-21 15:44 (p 2 of 2)
Test Code/ID: WGR1121.048 / 19-4807-4273

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	02-8745-8391	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	03 Dec-21 15:35	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	03 Dec-21 15:34	MD5 Hash:	41B41182B59AAABFB2FDAA23D11B52E4	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 03 Dec-21 15:44 (p 1 of 1)

Test Code/ID: WGR1121.048 / 19-4607-4273

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	18-0330-0744	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:02	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:02	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	07-2778-1040	Code:	WGR1121.048	Project:	021.APC.01
Sample Date:	03 Nov-21 11:50	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-005
Sample Age:	6d 1h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.75	7.115	8.385	7.7	7.8	0.03536	0.07072	0.91%	0
Overall		4	7.825	7.673	7.977	7.7	7.9	0.04787	0.09574	1.22%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.8	14.78	14.82	14.8	14.8	0	0	0.00%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
Overall		4	14.78	14.7	14.85	14.7	14.8	0.025	0.05	0.34%	0 (0%)



December 3, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-006
DATE RECEIVED:	11/4/2021
ABC LAB. NO.:	WGR1121.049

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00
EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 03 Dec-21 15:45 (p 1 of 1)
Test Code/ID: WGR1121.049 / 13-7975-4628

Eohaustorius 10-d Survival and Reburial Sediment Test				Aquatic Bioassay & Consulting Labs, Inc.			
Batch ID:	08-2960-3990	Test Type:	Survival-Reburial	Analyst:	Joe Freas		
Start Date:	09 Nov-21 13:03	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater		
Ending Date:	19 Nov-21 13:03	Species:	Eohaustorius estuarius	Brine:	Not Applicable		
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc	Age:	
Sample ID:	15-2924-7125	Code:	WGR1121.049	Project:	021.APC.01		
Sample Date:	03 Nov-21 11:00	Material:	Sediment	Source:	Bioassay Report		
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-006		
Sample Age:	6d 2h	Client:	WGR Southwest Inc.				

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
00-3242-7330	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	0.5000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
00-3242-7330	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	—	0.00%
100		5	0.9900	0.9622	1.0180	0.9500	1.0000	0.0100	0.0224	2.26%	1.00%

Survival Rate Detail

MD5: 15A6E9300CFE050D39B6D7C56B2CBB62

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		0.9500	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		19/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 03 Dec-21 15:45 (p 1 of 2)
Test Code/ID: WGR1121.049 / 13-7975-4628

Eohaustorius 10-d Survival and Reburial Sediment Test				Aquatic Bioassay & Consulting Labs, Inc.	
Analysis ID:	00-3242-7330	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	03 Dec-21 15:40	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	03 Dec-21 15:39	MD5 Hash:	15A6E9300CFE050D39B6D7C56B2CBB62	Editor ID:	007-979-628-1
Batch ID:	08-2960-3990	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:03	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:03	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	15-2924-7125	Code:	WGR1121.049	Project:	021.APC.01
Sample Date:	03 Nov-21 11:00	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-006
Sample Age:	6d 2h	Client:	WGR Southwest Inc.		

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	100% passed survival rate endpoint	2.36%

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	25	---	1	8	Exact	0.5000	Non-Significant Effect

Test Acceptability Criteria

		TAC Limits			
Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0012877	0.0012877	1	1	0.3466	Non-Significant Effect
Error	0.0103014	0.0012877	8			
Total	0.0115891		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Levene Equality of Variance Test	7.111	11.26	0.0285	Equal Variances
	Mod Levene Equality of Variance Test	1	13.75	0.3559	Equal Variances
	Variance Ratio F Test				Indeterminate
Distribution	Anderson-Darling A2 Test	1.796	3.878	<1.0E-05	Non-Normal Distribution
	D'Agostino Skewness Test	3.335	2.576	0.0009	Non-Normal Distribution
	Kolmogorov-Smirnov D Test	0.4	0.3025	6.1E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.6247	0.7411	0.0001	Non-Normal Distribution

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	0.9900	0.9622	1.0000		0.9500	1.0000	0.0100	2.26%	1.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4360	1.3730	1.4990		1.3450	1.4590	0.0227	3.53%	1.56%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		0.9500	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.3450	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 03 Dec-21 15:45 (p 2 of 2)
Test Code/ID: WGR1121.049 / 13-7975-4628

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	00-3242-7330	Endpoint:	Survival Rate	CETIS Version:	CETISv1.9.7
Analyzed:	03 Dec-21 15:40	Analysis:	Nonparametric-Two Sample	Status Level:	1
Edit Date:	03 Dec-21 15:39	MD5 Hash:	15A6E9300CFE050D39B6D7C56B2CBB62	Editor ID:	007-979-628-1

CETIS Measurement Report

Report Date: 03 Dec-21 15:45 (p 1 of 1)
 Test Code/ID: WGR1121.049 / 13-7975-4628

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 08-2960-3990	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 09 Nov-21 13:03	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 19 Nov-21 13:03	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 15-2924-7125	Code: WGR1121.049	Project: 021.APC.01
Sample Date: 03 Nov-21 11:00	Material: Sediment	Source: Bioassay Report
Receipt Date: 04 Nov-21 16:00	CAS (PC):	Station: SED-006
Sample Age: 6d 2h	Client: WGR Southwest Inc.	

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	9.95	9.315	10.59	9.9	10	0.03536	0.07073	0.71%	0
Overall		4	10	9.87	10.13	9.9	10.1	0.04082	0.08165	0.82%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
Overall		4	7.9	7.9	7.9	7.9	7.9	0	0	0.00%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
Overall		4	14.75	14.66	14.84	14.7	14.8	0.02887	0.05774	0.39%	0 (0%)



December 3, 2021

Amber Ballrot
WGR Southwest, Inc.
1801 E. Sepulveda Blvd.
Carson, CA 90749

Dear Mrs. Ballrot:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025*. Results were as follows:

CLIENT:	WGR Southwest, Inc.
SAMPLE I.D.:	SED-007
DATE RECEIVED:	11/4/2021
ABC LAB. NO.:	WGR1121.050

ACUTE EOHAUSTORIUS SURVIVAL BIOASSAY

NOEC =	100.00 %
TUc =	1.00

EC25 =	>100.00 %
EC50 =	>100.00 %

Yours very truly,


Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 03 Dec-21 15:45 (p 1 of 1)

Test Code/ID: WGR1121.050 / 19-2953-9426

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	11-9884-2703	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:04	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:04	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	03-8581-9407	Code:	WGR1121.050	Project:	021.APC.01
Sample Date:	03 Nov-21 09:30	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-007
Sample Age:	6d 4h	Client:	WGR Southwest Inc.		

Single Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-9744-5931	Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	100% passed survival rate	1

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
19-9744-5931	Survival Rate	Control Resp	1	0.9	>>	Yes	Passes Criteria

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
100		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%

Survival Rate Detail

MD5: 41B41182B59AAABFB2FDAA23D11B52E4

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	20/20	20/20	20/20	20/20	20/20
100		20/20	20/20	20/20	20/20	20/20

CETIS Analytical Report

Report Date: 03 Dec-21 15:45 (p 1 of 2)
Test Code/ID: WGR1121.050 / 19-2953-9426

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 19-9744-5931	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 15:43	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 03 Dec-21 15:42	MD5 Hash: 41B41182B59AAABFB2FDAA23D11B52E4	Editor ID: 007-979-628-1
Batch ID: 11-9884-2703	Test Type: Survival-Reburial	Analyst: Joe Freas
Start Date: 09 Nov-21 13:04	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 19 Nov-21 13:04	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 10d 0h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 03-8581-9407	Code: WGR1121.050	Project: 021.APC.01
Sample Date: 03 Nov-21 09:30	Material: Sediment	Source: Bioassay Report
Receipt Date: 04 Nov-21 16:00	CAS (PC):	Station: SED-007
Sample Age: 6d 4h	Client: WGR Southwest Inc.	

Data Transform	Alt Hyp	Comparison Result
Angular (Corrected)	C > T	100% passed survival rate endpoint

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		100	27.5	---	1	8	Exact	1.0000	Non-Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	Lower	Upper	Overlap	Decision
Control Resp	1	0.9	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1			Indeterminate
Error	0	0	8			
Total	0		9			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test				Indeterminate

Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%
100		5	1.0000	1.0000	1.0000		1.0000	1.0000	0.0000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%
100		5	1.4590	1.4580	1.4590		1.4590	1.4590	0.0000	0.00%	0.00%

Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000

Angular (Corrected) Transformed Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	N	1.4590	1.4590	1.4590	1.4590	1.4590
100		1.4590	1.4590	1.4590	1.4590	1.4590

CETIS Analytical Report

Report Date: 03 Dec-21 15:45 (p 2 of 2)
Test Code/ID: WGR1121.050 / 19-2953-9426

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 19-9744-5931	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 15:43	Analysis: Nonparametric-Two Sample	Status Level: 1
Edit Date: 03 Dec-21 15:42	MD5 Hash: 41B41182B59AAABFB2FDAA23D11B52E4	Editor ID: 007-979-628-1

CETIS Measurement Report

Report Date: 03 Dec-21 15:45 (p 1 of 1)

Test Code/ID: WGR1121.050 / 19-2953-9426

Eohaustorius 10-d Survival and Reburial Sediment Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	11-9884-2703	Test Type:	Survival-Reburial	Analyst:	Joe Freas
Start Date:	09 Nov-21 13:04	Protocol:	EPA/600/R-94/025 (1994)	Diluent:	Laboratory Seawater
Ending Date:	19 Nov-21 13:04	Species:	Eohaustorius estuarius	Brine:	Not Applicable
Test Length:	10d 0h	Taxon:	Malacostraca	Source:	Northwestern Aquatic Scienc Age:
Sample ID:	03-8581-9407	Code:	WGR1121.050	Project:	021.APC.01
Sample Date:	03 Nov-21 09:30	Material:	Sediment	Source:	Bioassay Report
Receipt Date:	04 Nov-21 16:00	CAS (PC):		Station:	SED-007
Sample Age:	6d 4h	Client:	WGR Southwest Inc.		

Dissolved Oxygen-mg/L

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	10.05	9.415	10.69	10	10.1	0.03536	0.07073	0.70%	0
100		2	10.15	9.515	10.79	10.1	10.2	0.03535	0.0707	0.70%	0
Overall		4	10.1	9.97	10.23	10	10.2	0.04082	0.08165	0.81%	0 (0%)

pH-Units

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
100		2	7.65	7.015	8.285	7.6	7.7	0.03535	0.07071	0.92%	0
Overall		4	7.775	7.536	8.014	7.6	7.9	0.075	0.15	1.93%	0 (0%)

Salinity-ppt

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
100		2	20	20	20	20	20	0	0	0.00%	0
Overall		4	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.03537	0.07075	0.48%	0
Overall		4	14.75	14.66	14.84	14.7	14.8	0.02887	0.05774	0.39%	0 (0%)

Tesoro Los Angeles Refinery - Carson Operations

Page 1 of 1

Facility Name LA Refinery - Carson Operations				City, State (Facility) 1801 E. Sepulveda Blvd., Carson CA 90749				Project Manager (Consultant) Chelsea Dreyer				Project No. (Consultant) 021.APC.01				Laboratory Name Aquatic Bioassay 29 N Olive Street Ventura 93001 (805) 643-5621			
Facility Contact Nate Busch				Facility Telephone No. (310) 847-3920				Telephone No. (Consultant) (562) 799-8510 ex. 1003				Fax No. (Consultant) (562) 799-8510							
Consultant Company WGR Southwest, Inc.								Consultant Address 11021 Winners Circle #101 Los Alamitos, California 90720											

Sample I.D.	Lab Sample No.	No. of Containers	Matrix				Prsv.		Sampling Date	Sampling Time	Eohaustorius estuarius (EPA 600/R-94/025)	FIELD ANALYSES								Special Detection Limit/Reporting		
			Soil	Water	Air	Other	Yes	No				pH (SU) [6.5-8.5]	Salinity (PSU)	Dissolved Oxygen (mg/L) [mean>7; single>5]	Specific Conductance (S/m)	Turbidity (NTU) [<50]	Temperature (Deg. F)					
SED-001																			Special QA/QC			
SED-002																						
SED-003		1	X				X		11/3/2021	15:20	X					7.7	17.8	1.61	2.83	37.5	72.3	Sub'd COC Atch'd:
SED-004		1	X				X		11/3/2021	14:00	X					7.37	10.9	12.59	1.82	42.4	75.6	
SED-005		1	X				X		11/3/2021	11:50	X					7.77	18.4	10.49	2.92	25.3	70.2	REMARK Email Results to: nbusch@marathonpetroleum.com cdreyer@wgr-sw.com aballrot@wgr-sw.com
SED-006		1	X				X		11/3/2021	11:00	X					8.09	22.8	12.21	3.53	17	69.6	
SED-007		1	X				X		11/3/2021	9:30	X					8.09	22.4	8.63	3.57	19.1	67	
Sample bottles required for each sample point: (1) x 1-gallon plastic bag																						
Sample Received Intact: Yes No										Temperature received: Ice No ice												
Relinquished by SAMPLER (Print & Sign Name) 									Date Time 11/4/21		Received by (Print & Sign Name) 11/4/21 1600											
Relinquished by (Print & Sign Name)									Date Time		Received by LABORATORY (Print & Sign Name)											Lab Work No.



96 Hour Eohaustorius estuarius Survival Bioassay - Standard Toxicant

DATE: 11/11/2021

STANDARD TOXICANT: Ammonium Chloride

ENDPOINT: SURVIVAL

UNIONIZED AMMONIA

NOEC = 0.4520mg/L

EC25 = 0.7175mg/L

EC50 = 1.4800mg/L

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 03 Dec-21 15:43 (p 1 of 1)
Test Code/ID: EOH111121 / 12-0123-2783

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-4821-6659	Test Type: Survival	Analyst: Joe Freas
Start Date: 11 Nov-21 12:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 15 Nov-21 12:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 96h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 13-9303-1400	Code: EOH111121	Project: REF TOX
Sample Date: 11 Nov-21 12:00	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date: 11 Nov-21 12:00	CAS (PC):	Station: REF TOX
Sample Age: —	Client: Internal Lab	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	PMSD	S
01-7753-4190	Survival Rate	Steel Many-One Rank Sum Test	0.452	0.806	0.6036	7.82%	1

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg/L	95% LCL	95% UCL	S
16-4974-2450	Survival Rate	Linear Interpolation (ICPIN)	EC10	0.5405	0.4504	0.6255	1
			EC15	0.5995	0.5051	0.7175	
			EC20	0.6585	0.5613	0.8237	
			EC25	0.7175	0.5926	0.9657	
			EC40	1.095	0.5699	1.403	
			EC50	1.48	1.194	1.787	

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
0.227		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	---	0.00%
0.452		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
0.806		4	0.6750	0.4748	0.8752	0.5000	0.8000	0.0629	0.1258	18.64%	32.50%
1.672		4	0.4500	0.3581	0.5419	0.4000	0.5000	0.0289	0.0577	12.83%	55.00%
3.524		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Survival Rate Detail

MD5: 779B24416C478260DD4B6685217B985C

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
0.227		1.0000	1.0000	1.0000	1.0000
0.452		1.0000	0.9000	1.0000	1.0000
0.806		0.8000	0.7000	0.7000	0.5000
1.672		0.5000	0.5000	0.4000	0.4000
3.524		0.0000	0.0000	0.0000	0.0000

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	10/10	10/10	10/10	10/10
0.227		10/10	10/10	10/10	10/10
0.452		10/10	9/10	10/10	10/10
0.806		8/10	7/10	7/10	5/10
1.672		5/10	5/10	4/10	4/10
3.524		0/10	0/10	0/10	0/10

CETIS Analytical Report

Report Date: 03 Dec-21 15:43 (p 1 of 2)
Test Code/ID: EOH111121 / 12-0123-2783

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 01-7753-4190	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 14:53	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 03 Dec-21 14:51	MD5 Hash: 779B24416C478260DD4B6685217B985C	Editor ID: 007-979-628-1
Batch ID: 07-4821-6659	Test Type: Survival	Analyst: Joe Freas
Start Date: 11 Nov-21 12:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 15 Nov-21 12:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 96h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 13-9303-1400	Code: EOH111121	Project: REF TOX
Sample Date: 11 Nov-21 12:00	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date: 11 Nov-21 12:00	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	MSDu	PMSD
Angular (Corrected)	C > T	0.452	0.806	0.6036	---	0.07815	7.82%

Steel Many-One Rank Sum Test

Control	vs	Conc-mg/L	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		0.227	18	10	1	6	CDF	0.8000	Non-Significant Effect
		0.452	16	10	1	6	CDF	0.5661	Non-Significant Effect
		0.806*	10	10	0	6	CDF	0.0350	Significant Effect
		1.672*	10	10	0	6	CDF	0.0350	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.54745	0.386862	4	69.22	<1.0E-05	Significant Effect
Error	0.083832	0.0055888	15			
Total	1.63128		19			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
	Levene Equality of Variance Test	3.828	4.893	0.0245	Equal Variances
	Mod Levene Equality of Variance Test	1.439	4.893	0.2695	Equal Variances
Distribution	Anderson-Darling A2 Test	1.472	3.878	0.0003	Non-Normal Distribution
	D'Agostino Kurtosis Test	2.167	2.576	0.0302	Normal Distribution
	D'Agostino Skewness Test	1.961	2.576	0.0498	Normal Distribution
	D'Agostino-Pearson K2 Omnibus Test	8.544	9.21	0.0140	Normal Distribution
	Kolmogorov-Smirnov D Test	0.3	0.2235	5.0E-05	Non-Normal Distribution
	Shapiro-Wilk W Normality Test	0.8614	0.866	0.0083	Non-Normal Distribution

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
0.227		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
0.452		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%
0.806		4	0.6750	0.4748	0.8752	0.7000	0.5000	0.8000	0.0629	18.64%	32.50%
1.672		4	0.4500	0.3581	0.5419	0.4500	0.4000	0.5000	0.0289	12.83%	55.00%
3.524		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
0.227		4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%
0.452		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%
0.806		4	0.9687	0.7557	1.1820	0.9912	0.7854	1.1070	0.0669	13.82%	31.39%
1.672		4	0.7351	0.6426	0.8276	0.7351	0.6847	0.7854	0.0291	7.91%	47.94%
3.524		4	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0.0000	0.00%	88.76%

CETIS Analytical Report

Report Date: 03 Dec-21 15:43 (p 2 of 2)
Test Code/ID: EOH111121 / 12-0123-2783

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 01-7753-4190 Endpoint: Survival Rate CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 14:53 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 03 Dec-21 14:51 MD5 Hash: 779B24416C478260DD4B6685217B985C Editor ID: 007-979-628-1

Survival Rate Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
0.227		1.0000	1.0000	1.0000	1.0000
0.452		1.0000	0.9000	1.0000	1.0000
0.806		0.8000	0.7000	0.7000	0.5000
1.672		0.5000	0.5000	0.4000	0.4000
3.524		0.0000	0.0000	0.0000	0.0000

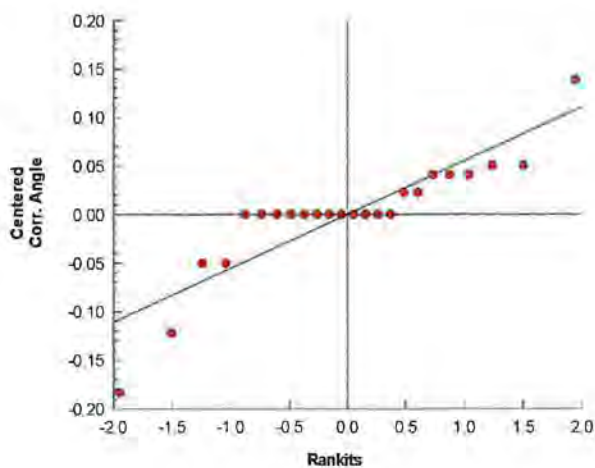
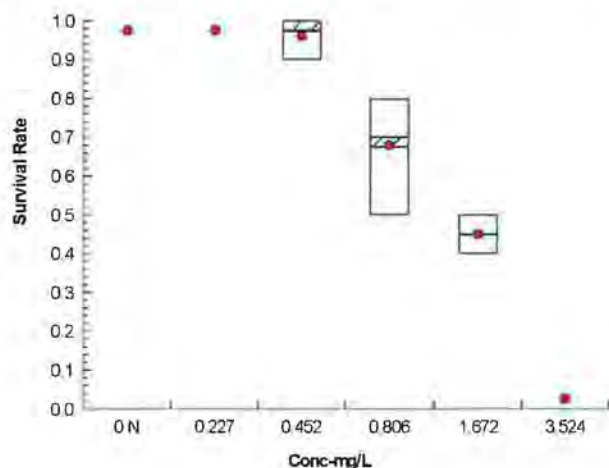
Angular (Corrected) Transformed Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.4120	1.4120	1.4120	1.4120
0.227		1.4120	1.4120	1.4120	1.4120
0.452		1.4120	1.2490	1.4120	1.4120
0.806		1.1070	0.9912	0.9912	0.7854
1.672		0.7854	0.7854	0.6847	0.6847
3.524		0.1588	0.1588	0.1588	0.1588

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	10/10	10/10	10/10	10/10
0.227		10/10	10/10	10/10	10/10
0.452		10/10	9/10	10/10	10/10
0.806		8/10	7/10	7/10	5/10
1.672		5/10	5/10	4/10	4/10
3.524		0/10	0/10	0/10	0/10

Graphics



CETIS Analytical Report

Report Date: 03 Dec-21 15:43 (p 1 of 2)
Test Code/ID: EOH111121 / 12-0123-2783

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 16-4974-2450	Endpoint: Survival Rate	CETIS Version: CETISv1.9.7
Analyzed: 03 Dec-21 14:53	Analysis: Linear Interpolation (ICPIN)	Status Level: 1
Edit Date: 03 Dec-21 14:51	MD5 Hash: 779B24416C478260DD4B6685217B985C	Editor ID: 007-979-628-1
Batch ID: 07-4821-6659	Test Type: Survival	Analyst: Joe Freas
Start Date: 11 Nov-21 12:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 15 Nov-21 12:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 96h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 13-9303-1400	Code: EOH111121	Project: REF TOX
Sample Date: 11 Nov-21 12:00	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date: 11 Nov-21 12:00	CAS (PC):	Station: REF TOX
Sample Age: ---	Client: Internal Lab	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	mg/L	95% LCL	95% UCL
EC10	0.5405	0.4504	0.6255
EC15	0.5995	0.5051	0.7175
EC20	0.6585	0.5613	0.8237
EC25	0.7175	0.5926	0.9657
EC40	1.095	0.5699	1.403
EC50	1.48	1.194	1.787

Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	A/B	Mean	%Effect
0	N	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
0.227		4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
0.452		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9750	2.50%
0.806		4	0.6750	0.7000	0.5000	0.8000	18.64%	32.50%	27/40	0.6750	32.50%
1.672		4	0.4500	0.4500	0.4000	0.5000	12.83%	55.00%	18/40	0.4500	55.00%
3.524		4	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/40	0.0000	100.00%

Survival Rate Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	1.0000	1.0000	1.0000	1.0000
0.227		1.0000	1.0000	1.0000	1.0000
0.452		1.0000	0.9000	1.0000	1.0000
0.806		0.8000	0.7000	0.7000	0.5000
1.672		0.5000	0.5000	0.4000	0.4000
3.524		0.0000	0.0000	0.0000	0.0000

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	N	10/10	10/10	10/10	10/10
0.227		10/10	10/10	10/10	10/10
0.452		10/10	9/10	10/10	10/10
0.806		8/10	7/10	7/10	5/10
1.672		5/10	5/10	4/10	4/10
3.524		0/10	0/10	0/10	0/10

CETIS Analytical Report

Report Date: 03 Dec-21 15:43 (p 2 of 2)

Test Code/ID: EOH111121 / 12-0123-2783

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 16-4974-2450

Endpoint: Survival Rate

CETIS Version: CETISv1.9.7

Analyzed: 03 Dec-21 14:53

Analysis: Linear Interpolation (ICPIN)

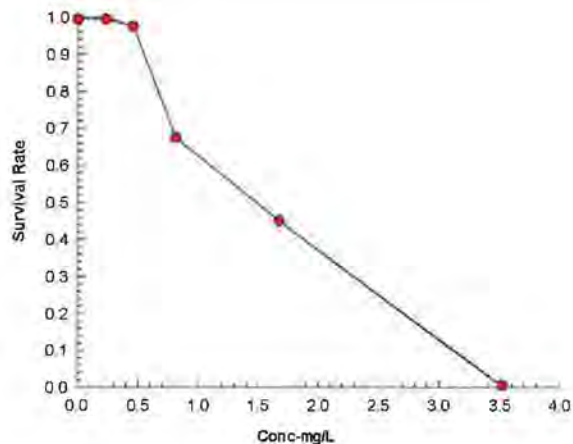
Status Level: 1

Edit Date: 03 Dec-21 14:51

MD5 Hash: 779B24416C478260DD4B6685217B985C

Editor ID: 007-979-628-1

Graphics



CETIS Measurement Report

Report Date: 03 Dec-21 15:43 (p 1 of 1)

Test Code/ID: EOH111121 / 12-0123-2783

Reference Toxicant 96-h Acute Survival Test

Aquatic Bioassay & Consulting Labs, Inc.

Batch ID: 07-4821-6659	Test Type: Survival	Analyst: Joe Freas
Start Date: 11 Nov-21 12:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Laboratory Seawater
Ending Date: 15 Nov-21 12:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 96h	Taxon: Malacostraca	Source: Northwestern Aquatic Scienc Age:
Sample ID: 13-9303-1400	Code: EOH111121	Project: REF TOX
Sample Date: 11 Nov-21 12:00	Material: Ammonia (Unionized)	Source: Reference Toxicant
Receipt Date: 11 Nov-21 12:00	CAS (PC):	Station: REF TOX
Sample Age: —	Client: Internal Lab	

Dissolved Oxygen-mg/L

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	6.55	5.915	7.185	6.5	6.6	0.03535	0.0707	1.08%	0
0.227		2	6.7	4.159	9.241	6.5	6.9	0.1414	0.2828	4.22%	0
0.452		2	7	7	7	7	7	0	0	0.00%	0
0.806		2	6.55	5.915	7.185	6.5	6.6	0.03535	0.0707	1.08%	0
1.672		2	6.5	2.688	10.31	6.2	6.8	0.2121	0.4243	6.53%	0
3.524		2	6.35	4.444	8.256	6.2	6.5	0.1061	0.2121	3.34%	0
Overall		12	6.608	6.436	6.781	6.2	7	0.07829	0.2712	4.10%	0 (0%)

pH-Units

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
0.227		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
0.452		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
0.806		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
1.672		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
3.524		2	7.9	7.884	7.916	7.9	7.9	0	0	0.00%	0
Overall		12	7.9	7.9	7.9	7.9	7.9	0	0	0.00%	0 (0%)

Salinity-ppt

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	20	20	20	20	20	0	0	0.00%	0
0.227		2	20	20	20	20	20	0	0	0.00%	0
0.452		2	20	20	20	20	20	0	0	0.00%	0
0.806		2	20	20	20	20	20	0	0	0.00%	0
1.672		2	20	20	20	20	20	0	0	0.00%	0
3.524		2	20	20	20	20	20	0	0	0.00%	0
Overall		12	20	20	20	20	20	0	0	0.00%	0 (0%)

Temperature-°C

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	N	2	15	15	15	15	15	0	0	0.00%	0
0.227		2	14.95	14.31	15.59	14.9	15	0.03538	0.07075	0.47%	0
0.452		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
0.806		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
1.672		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
3.524		2	14.9	14.87	14.93	14.9	14.9	0	0	0.00%	0
Overall		12	14.92	14.9	14.95	14.9	15	0.01306	0.04523	0.30%	0 (0%)

ATTACHMENT 4

SEDIMENT BIOASSAY DATA VALIDATION REPORT

**Tesoro Refining & Marketing LLC
Los Angeles Refinery – Carson Operations
Sediment Bioassay Data Validation Report**

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Attachment:

Attachment I – Dominguez Channel Estuary Sediment Bioassay Data Validation Form

1.0 Chronic Toxicity Test Overview

On behalf of Tesoro Refining & Marketing Company LLC, Los Angeles Refinery – Carson Operations (herein facility), WGR Southwest, Inc. (WGR) collected sediment samples at monitoring locations SED-003, SED-004, SED-005, SED-006, and SED-007 as required in National Pollutant Discharge Elimination System (NPDES) No. CA0000680. Sediment samples for chronic toxicity testing were collected on November 3, 2021 and submitted to Aquatic Bioassay & Consulting Laboratories Inc. on November 4, 2021 for analysis. Aquatic Bioassay & Consulting Laboratories has Environmental Laboratory Accreditation Program (ELAP) Certification number 1907.

In accordance with NPDES No. CA0000680 Attachment E, Section V.A.4, chronic toxicity samples are required to undergo a species sensitivity screening by concurrently conducting three toxicity tests using the fish, invertebrate and alga species listed in the permit order. Based on the results of the species sensitivity screening, the single species exhibiting the highest percent effect is required to be used for routine monitoring during the permit cycle. The species listed in the permit order, however, are more commonly used to evaluate effluent chronic toxicity rather than sediment toxicity. Therefore, with laboratory staff and Regional Water Quality Control Board guidance, a species sensitivity screening was conducted for chronic toxicity samples on September 25, 2019 using two different sediment species: *Eohaustorius estuarius* and *Mytilus galloprovincialis*. As explained in the September 25th sediment report, both sediment species exhibited no observed effect concentration to the sediment samples collected from Stations SED-005, SED-006 and SED-007. Given that both species exhibited no toxicity effect, the facility opted to utilize *Eohaustorius estuarius* in this chronic toxicity testing. Therefore, sediment chronic toxicity samples collected on November 3, 2021 were tested using *Eohaustorius estuarius* in accordance with the guidelines prescribed in Methods for Assessing the Toxicity of Sediment Associated Contaminants with Estuarine and Marine Amphipods, Method EPA/600/R-94/025.

2.0 Data Review

A level 2 data verification protocol was used for bioassay validation. The level 2 data review compares bioassay testing holding conditions, test setup, test implementation, and test termination in accordance with bioassay protocols. As part of the level 2 data verification protocol the laboratory was expected to follow all internal quality control procedures as directed in the applicable analytical method. Outcome of the data review for each of the chronic toxicity tests performed is documented in the *Chronic Toxicity QA/QC Bioassay Data Validation Form* included in Attachment I of this report.

Sediment samples at Stations SED-003, SED-004, SED-005, SED-006, and SED-007 were collected on November 3, 2021 by WGR Southwest Inc. All collected samples were preserved as required and submitted to Aquatic Bioassay and Consulting Laboratories Inc. on November 4, 2021. Chronic toxicity tests for all five stations began on November

9, 2021 and concluded on November 19, 2021. A summary of data usability determinations for the chronic toxicity test performed are described in the following section.

3.0 *Eohaustorius estuarius* Chronic Toxicity Test

3.1 Sample Collection, Sample Preservation, Chain of Custody

Sediment samples for *E. estuarius* chronic toxicity testing were collected from Stations SED-003, SED-004, SED-005, SED-006, and SED-007 using an Eckman dredge sampler. Sampling equipment was decontaminated prior to use at each station to prevent cross contamination. Field samples were handled with care to minimize sediment disturbance and prevent the loss of sample integrity, chemical speciation and chemical equilibrium. Collected samples were maintained at 4°C and a Chain of Custody documenting the collected samples was completed and submitted to Aquatic Bioassay & Consulting Laboratories Inc. Chronic toxicity testing was initiated for all samples within the required 14-day holding time for sample collection and analysis. Document review of sample collection, sample preservation and Chain of Custody procedures was deemed acceptable and in compliance with the facility's Waste Discharge Requirements (WDRs).

3.2 Test Setup

Chronic toxicity testing with *E. estuarius* was completed in accordance with EPA method 600/R-94-025. Organisms used for testing were field collected and supplied by Northwestern Amphipod in Oregon. Amphipods ranging in 3-5 mm in size were used, with at least twenty organisms per replicate. Test setup review is provided in the bioassay data validation form attached to this document. Based on a review of laboratory test setup procedures, test set up procedure were deemed acceptable and in compliance with EPA method requirements.

3.3 Test Implementation

Test implementation for chronic toxicity testing with *E. estuarius* was completed in accordance with EPA method 600/R-94/025. Water quality measurements were recorded during the duration of the test and were found to be in the acceptable range as specified in the test protocol. Ranges for the water quality measurements are provided in the QA/QC Checklist of Attachment I. No abnormal conditions were observed throughout the duration of the test. Thus, the test implementation was determined to be acceptable and in compliance with EPA method requirements.

3.3.1 Test Acceptability Criteria

3.3.1.1 Reference Toxicant

The reference toxicant used during *E. estuarius* chronic toxicity testing was unionized ammonia. The length of the reference toxicant test was 96 hours. All reference toxicant testing was within the two standard deviation quality control limit meeting the test acceptability criteria in compliance with EPA method requirements.

3.3.1.2 Negative Control Samples

Negative control samples demonstrated a 99% survival at all sample stations, which is above the 90% mean acceptability survival criteria. As a result, the negative control sample results are considered acceptable at all sampled stations and in compliance with EPA method requirements.

3.4 Reporting

Bioassay results were delivered in an acceptable laboratory report documenting a summary of water quality results, reference toxicity results, test results, statistical calculations and percent mortality. Additional information regarding test setup/test implementation procedures was provided by the laboratory to complete the QA/QC bioassay data validation form. Overall, the reporting component presenting chronic toxicity test results for *E. estuarius* was deemed acceptable.

3.5 Overall Data Usability

Review of laboratory data indicated chronic toxicity testing was performed in accordance with EPA method 600/R-94/025 as documented in Attachment I. Through the bioassay laboratory report and additional clarification from the laboratory, the bioassay test results at all sample stations was deemed acceptable and in compliance with EPA method requirements.

Attachment I

Dominguez Channel Estuary

Sediment Bioassay Data Validation Form

Tesoro Refining & Marketing LLC Los Angeles Refinery - Carson Operations Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation			
PROJECT INFORMATION			
Project Name:	Dominguez Channel Sediment Sampling		
Analytical Laboratory:	Aquatic Bioassays & Consulting Laboratories Inc.		
Laboratory Technician:	Joe Freas		
Sample Collection Date:	November 3, 2021		
Sample Locations/Lab Number:	SED-003 / WGR1121.046 SED-004 / WGR1121.047 SED-005 / WGR1121.048 SED-006 / WGR1121.049 SED-007 / WGR1121.050		
Species/Test Method Referenced:	Eohaustorius estuarius EPA/600/R-94-025	Test Duration:	SED-003: November 9, 2021 @ 13: 00 - November 19, 2021 @13:00 (10 day) SED-004: November 9, 2021 @ 13: 01 - November 19, 2021 @13:01 (10 day) SED-005: November 9, 2021 @ 13: 02 - November 19, 2021 @13:02 (10 day) SED-006: November 9, 2021 @ 13: 03 - November 19, 2021 @13:03 (10 day) SED-007: November 9, 2021 @ 13: 04 - November 19, 2021 @13:04 (10 day)
Sample Matrix:	Sediment		
Type of Species:	Estuarine		
Data Validator:	Amber Ballrot		
Validation Date:	December 9, 2021		
Signature:			
Problems Noted:	No problems or deficiencies identified. Chronic toxicity testing was performed in accordance with EPA method guidelines.		
EOHAUSTORIUS ESTUARIUS			
Completeness and Holding Conditions:			
Type of Samples Collected: Grab Sediment Samples		Number of Samples Analyzed: 5	
Were samples maintained at 4°C and in the dark after collection? Yes			
Did chronic toxicity testing begin within 14 days of sample collection? Yes			
Holding conditions acceptable? Yes			
If holding conditions were not acceptable, explain: N/A			

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Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation

Quality of Test Organism, Collection and Acclimation:

Who is the supplier of the test organisms?	Northwestern Amphipod in Oregon
Are organisms field collected or cultured?	Field Collected
If field collected:	
Where was the collection location? Oregon	
What was the organism collection date? Organism were collected on November 1, 2021 and received by the laboratory on November 3, 2021.	
What was the water salinity and temperature at the time of collection? Water salinity at the time of collection was 27 ppt. Temperature at the time of collection was 17.5 Degrees Celsius. Acclimation after collection began at 25 ppt. Final acclimation in laboratory was from 23 ppt to 20 ppt at -1 ppt/day.	
Was site sediment collected for holding and acclimation purposes? Yes, 2L of site sediment was collected and used for acclimation.	
Additional Comments: Quality of test organisms, collection, and acclimation is deemed acceptable.	

Field Collection Sorting Methods

Were healthy amphipods placed into 10 cm diameter finger bowls with 2 cm sieved site sediment and seawater of appropriate salinity? Yes, only healthy organisms were used for bioassay testing. All sediment was sieved through stainless 2mm sieve. Overlying water of 20ppt was used for testing.
Were organisms held for 2-10 days? Yes, organisms were held for 6 days prior to testing.
Was test sediment sieved through 2 mm sieve or forceps for predator removal? Yes, all sediment was sieved using a stainless steel 2mm sieve.
Was control sediment sieved twice through 0.5 mm? Yes, control sediment was sieved using a 0.5mm stainless sieve two times.
Did control sediment have a 4-hour settling period after each sieving? Yes, control has a >4 hour settling period after each sieving.

Test Initiation

Was salinity adjusted in all testing chambers? Yes
Was overlying ammonia detected? No ammonia was detected on overlying water. MDL 0.1mg/L.
Were there at least 5 replicates per sample? Yes
Was there at least 20 animals per replicate? Yes
Was the organism length between 3-5 mm during test initiation? Yes, organism length was checked using dial calipers and confirmed within 3-5mm at test initiation.
Was the overlying water volume 800 mL? Yes
Were there any water quality adjustments? Yes, water quality measurements were collected during the duration of the test and are provided in the corresponding laboratory report.

Test Implementation

Photoperiod for 24 hours? Yes, 24 hour light cycle was employed for testing.
Was daily water quality monitoring conducted? Yes
What was the overlying daily temperature range (15°C)? The overlying daily temperature was maintained at 15°C.

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Dominguez Channel Estuary Chronic Toxicity QA/QC Bioassay Data Validation

Was the daily salinity range 20+/-1 ppt? Yes, salinity range was 20ppt.

Was water renewal conducted? No, water remained static and was not renewed over the 10-day exposure period as required in the EPA method.

Was the overlying daily pH between 7 – 8 standard units? Yes

What was the overlying ammonia detection (ND)? No ammonia was detected during testing.

Were appropriate test chambers used (1-liter glass containers with 10 cm diameter)? Yes

Was water in each test chamber aerated overnight before start and throughout the test? Yes, aeration occurred at 1 bbl/second throughout testing.

Did the water maintain at least more than 90% saturation of dissolved oxygen concentration? Yes

Test Results and Analysis

Were the number of amphipods reported for each replicate? Yes

Was the percent mortality reported for each replicate? Yes

Was the sample mean for survival reported? Yes, the mean control survival was 99-100%

QA/QC Samples

Positive Control

Length of reference toxicity test? 96 hours

What reference toxicant was used? Unionized Ammonia

Exposure concentrations? Exposure ammonia concentrations were 0, 15.6, 32.2, 62.5, 125.0, 250 mg/L

Did EC 50 fall within lab standards? Yes

Negative Control

Negative control response above 90% acceptability criteria? Yes

Mean control survival? 99%

Did EC 50 fall within lab standards? Yes