

City of Laredo
INTERNATIONAL AIRPORT
LAREDO, TEXAS 78041

OFFICE OF THE AIRPORT DIRECTOR
518 FLIGHTLINE, BUILDING No. 132
August 8, 1990

TELEPHONE: (512) 722-4933
(512) 722-9826
FAX: (512) 726-4950

Ms. Anne S. Miller
Texas Water Commission
P. O. Box 13087
Capitol Station
Austin, TX 78711-3087

Re: Laredo International Airport
LUST ID NO. 95021

Dear Ms. Miller:

Enclosed please find a copy of the certification report on our six underground fuel storage tanks which tested tight.

A site assessment report from our consultant is anticipated by this week and a copy will be provided to your office directly from the consultant.

A purchase order has been issued to Trinity Testing to test the fuel lines. Airport maintenance personnel have been readying the fuel lines for testing by replacing gaskets, preparing blind flanges to isolate the lines, removing old paint from flange bolts, etc. The Fixed Base Operators have replaced certain valves and made other repairs. We have requested from Trinity Testing to complete testing of the fuel lines as soon as possible but no later than August 15, 1990.

To date the City/Airport fund has incurred the following expenses which now approximate \$27,800.

Leak-Tec Corp., install monitor wells	\$ 2,150
Leak-Tec Corp., install two recovery wells	3,950
*Malcolm Pirnie, tank and line tightness tests	4,800
Leak-Tec Corp., site assessment	15,000
Trinity Testing, test fuel lines	1,900
	<u>\$27,800</u>

*The fuel lines were scheduled to be tested at the same time as the tanks, but because of logistics problems in filling six 25,000-gallon fuel tanks and because of the need to isolate the fuel lines from the pumps and filtration vessels, testing of the lines was not feasible under the two-day contract with Malcolm Pirnie.

00594

August 8, 1990

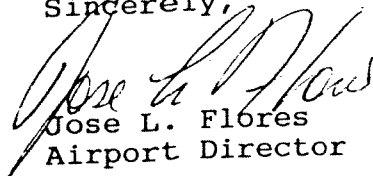
Ms. Anne S. Miller
Texas Water Commission

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Please advise which of the above-referenced expenses are eligible for reimbursement by the Petroleum Storage Tank Remediation Fund.

Thank you for your assistance. We look forward to a satisfactory conclusion of the pre-remediation phase.

Sincerely,



Jose L. Flores
Airport Director

xc: Mr. Jeff Lewellin
Mr. Joe Aranda
Aero Center
Morgan's Aviation

00595

July 31, 1990

Amador Escudero, P.E.
City Engineer
City of Laredo
4001 N. Bartlett Avenue
Laredo, TX 78041

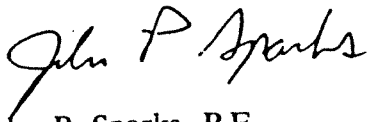
Re: Laredo International Airport Fuel Farm
Tank Leak Testing Results

Dear Mr. Escudero:

Attached please find our report on tank leak testing performed at the Laredo International Airport July 12 through July 15. If you have any questions please feel free to call me at the number below or Mr. William Guarniere at (713) 493-3471.

Very truly yours,

MALCOLM PIRNIE, INC.



John P. Sparks, P.E.
Senior Project Engineer

mr

c: Mr. Jose L. Flores, Airport Director

1633-01-1

RECEIVED AUG 3 1990

00596



Bandy & Associates

Geotechnical, Environmental and Construction Materials Consultants

Mr. John Sparks
Malcolm Pirnie, Inc.
10947 Town & Country Way
Suite 600
Houston, TX 77024

July 25, 1990

Re: Test No. 900713
Performed July 12 thru July 15, 1990
Loredo International Airport
518 Flight Line
Loredo, TX

Dear John;

The underground storage tanks containing Jet-A and Avgas tested on January 12 thru July 15, 1990 tested tight as defined by regulations USEPA 40 CFR Part 280 and NFPA 329-87. The results of the tests are presented below:

Product	Volume (GAL)	Water in Tank (INCHES)	High Level Leak Rate (GPH)	Low Level Leak Rate (GPH)	Full System	Tank Only
AVGAS	25,000	0.00	-0.01 @ 10"	N/A	Tight to 10"	PASS
JET A-A	25,000	0.00	0.00 @ 12"	N/A	Tight to 12"	PASS
JET A-B	25,000	0.00	-0.03 @ 10"	N/A	Tight to 10"	PASS
JET A-C	25,000	0.00	0.00 @ 10"	N/A	Tight to 10"	PASS
JET A-D	25,000	0.00	0.02 @ 12"	N/A	Tight to 12"	PASS
AVGAS	25,000	0.00	-0.02 @ 12"	N/A	Tight to 12"	PASS

The high level tests of the tank systems at this location are considered sufficient for certification purposes since the water level in the backfill area is below the point of hydrostatic equilibrium.

As we discussed, the pressure line tests performed on the 4" product lines yielded inconclusive results. We believe the reason for the inconclusive results is that the ballcock valves at the end of the lines are leaking product back into the tank. To properly test these lines it will be necessary to disconnect the lines from the tanks at the valves and cap them. This is the only method we can recommend to properly test these lines.

Attached are copies of the strip charts indicating the test results for each tank tested. These tests meet all of the requirements set forth by NFPA 329-87 and USEPA 40 CFR part 280.

Please maintain these documents as part of the files on your fuel system. These documents indicate that you have met the tank tightness part of the new regulations. As discussed, you must also maintain records reflecting that you are performing monthly inventory control.

We sincerely appreciate the opportunity to serve you. If we can be of further service in any way, please contact us.

Sincerely,

William H. Guarniere

00597

STRIP CHART FOR DATA RECORD: 90071357.R10 OF 25000 GALLON AVGAS100LL TANK @ LARADO INTL AIRPRT 518 FLIGHTLINE LARADO

TEST OPERATOR: 8.GUARNIERE

LEAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 104.7 MIN / DENSITY: .69 / TANK TEMP @ START: 86 F / COE: .000761

		----- a = 10 F -----		AVG	THREE
		----- t = .1 F -----		LEAK	STD
TIME	GALLONS	----- V = .1 gal -----		RATE	DEV
671.5	2.6271			-0.01	0.02
672.5	2.6243			-0.01	9.99
673.6	2.6212			-0.01	9.99
674.7	2.6181			-0.01	0.00
675.7	2.6153			-0.01	0.00
676.8	2.6121			-0.01	0.00
677.8	2.6093			-0.01	0.00
678.9	2.6062			-0.01	0.00
679.9	2.6034			-0.01	0.00
681.0	2.6003			-0.01	0.00
682.0	2.5975			-0.01	0.00
683.1	2.5943			-0.01	0.00
684.2	2.5912			-0.01	0.00
685.2	2.5884			-0.01	0.00
686.3	2.5853			-0.01	0.00
687.3	2.5825			-0.01	0.00
688.4	2.5794			-0.01	0.00
689.4	2.5765			-0.01	0.00
690.5	2.5734			-0.01	0.00
691.6	2.5703			-0.01	0.00
692.6	2.5675			-0.01	0.00
693.7	2.5644			-0.01	9.99
694.7	2.5616			-0.01	9.99
695.8	2.5584			-0.01	9.99
696.8	2.5556			-0.01	9.99
697.9	2.5525			-0.01	9.99
698.9	2.5497			-0.01	9.99
700.0	2.5466			-0.01	9.99
701.1	2.5435			-0.01	9.99
702.1	2.5406			-0.01	0.00
703.1	2.5378			-0.01	0.00
704.2	2.5347			-0.01	0.00
705.2	2.5319			-0.01	0.00
706.2	2.5291			-0.01	0.00
707.3	2.5259			-0.01	0.00
708.3	2.5231			-0.01	0.00
709.4	2.5200			-0.01	0.00
710.5	2.5169			-0.01	0.00
711.5	2.5141			-0.01	0.00
712.6	2.5110			-0.01	0.00
713.6	2.5081			-0.01	0.00
714.7	2.5050			-0.01	9.99
715.8	2.5019			-0.01	9.99
716.8	2.4991			-0.01	9.99
717.9	2.4960			-0.01	9.99
718.9	2.4932			-0.01	9.99
719.9	2.4903			-0.01	9.99
721.0	2.4872			-0.01	9.99
722.0	2.4844			-0.01	9.99
723.0	2.4816			-0.01	9.99
724.1	2.4785			-0.01	9.99
725.1	2.4756			-0.01	9.99
726.2	2.4725			-0.01	9.99
727.3	2.4694			-0.01	9.99
728.3	2.4666			-0.01	9.99
729.4	2.4635			-0.01	9.99
730.4	2.4607			-0.01	9.99
731.5	2.4575			-0.01	9.99
733.5	2.4519			-0.01	0.00
734.5	2.4491			-0.01	0.00
735.6	2.4460			-0.01	0.00
736.7	2.4428			-0.01	0.00
737.7	2.4400			-0.01	0.00
738.8	2.4369			-0.01	0.00
739.8	2.4341			-0.01	9.99
740.9	2.4310			-0.01	9.99
741.9	2.4281			-0.01	9.99
743.0	2.4250			-0.01	9.99
744.1	2.4219			-0.01	9.99
745.1	2.4191			-0.01	0.00
746.2	2.4160			-0.01	9.99
747.2	2.4132			-0.01	9.99
748.3	2.4101			-0.01	9.99
749.3	2.4072			-0.01	9.99

END OF STRIP CHART 90071357.R10 DATA COLLECTED ON LEAK COMPUTER S/N 88121906

00598

STRIP CHART FOR DATA RECORD: 90071358.R12 OF 25000 GALLON JET A TANK @ LARADO INTL AIRPORT, 518 FLIGHTLINE, LARAD

TEST OPERATOR: BILL GUARNIERE

LEAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 185.6 MIN / DENSITY: .77 / TANK TEMP @ START: 90 F / COE: .0005

		----- a = 10 F ----->		AVG	THREE
		----- t = .1 F ----->		LEAK	STD
		----- V = .1 gal ----->		RATE	DEV
TIME	GALLONS				
929.0	3.4720			-0.02	0.03
930.0	3.4681			0.00	9.99
931.1	3.4638			0.00	0.00
932.1	3.4600			0.00	0.00
933.2	3.4557			0.00	0.00
934.2	3.4518			0.00	0.00
935.3	3.4476			0.00	0.00
936.3	3.4437			0.00	0.00
937.3	3.4398			0.00	0.00
938.4	3.4356			0.00	0.00
939.4	3.4317			0.00	0.00
940.5	3.4274			0.00	0.00
941.5	3.4236			0.00	0.00
942.6	3.4193			0.00	0.00
943.6	3.4155			0.00	0.00
944.7	3.4112			0.00	0.00
945.7	3.4073			0.00	0.00
946.8	3.4031			0.00	0.00
947.8	3.3992			0.00	0.00
948.8	3.3953			0.00	0.00
949.9	3.3911			0.00	0.00
950.9	3.3872			0.00	0.00
951.9	3.3833			0.00	0.00
953.0	3.3791			0.00	0.00
954.0	3.3752			0.00	0.00
955.1	3.3709			0.00	0.00
956.2	3.3667			0.00	0.00
957.2	3.3628			0.00	0.00
958.2	3.3589			0.00	0.00
959.3	3.3547			0.00	0.00
960.3	3.3508			0.00	0.00
961.3	3.3469			0.00	0.00
962.4	3.3427			0.00	0.00
963.4	3.3388			0.00	0.00
964.5	3.3346			0.00	0.00
965.5	3.3307			0.00	0.00
966.5	3.3268			0.00	0.00
967.6	3.3226			0.00	0.00
968.6	3.3187			0.00	0.00
969.7	3.3144			0.00	0.00
970.7	3.3106			0.00	9.99
971.7	3.3067			0.00	0.00
972.8	3.3024			0.00	9.99
973.8	3.2986			0.00	0.00
974.8	3.2947			0.00	0.00
975.9	3.2904			0.00	0.00
976.9	3.2866			0.00	0.00
978.0	3.2823			0.00	9.99
979.0	3.2784			0.00	9.99
980.0	3.2746			0.00	9.99
981.1	3.2703			0.00	9.99
982.1	3.2664			0.00	0.00
983.2	3.2622			0.00	9.99
984.2	3.2583			0.00	0.00
985.2	3.2544			0.00	9.99
986.3	3.2502			0.00	9.99
987.3	3.2463			0.00	9.99
988.3	3.2424			0.00	9.99
989.4	3.2382			0.00	0.00
990.4	3.2343			0.00	0.00
991.5	3.2300			0.00	9.99
992.5	3.2262			0.00	9.99
993.5	3.2223			0.00	9.99
994.6	3.2180			0.00	9.99
995.6	3.2142			0.00	0.00
996.7	3.2099			0.00	9.99
997.7	3.2060			0.00	9.99
998.7	3.2022			0.00	9.99
999.8	3.1979			0.00	9.99
1000.8	3.1940			0.00	9.99
1001.9	3.1898			0.00	9.99
1002.9	3.1859			0.00	9.99
1003.9	3.1820			0.00	9.99
1005.0	3.1778			0.00	9.99
1006.0	3.1739			0.00	9.99

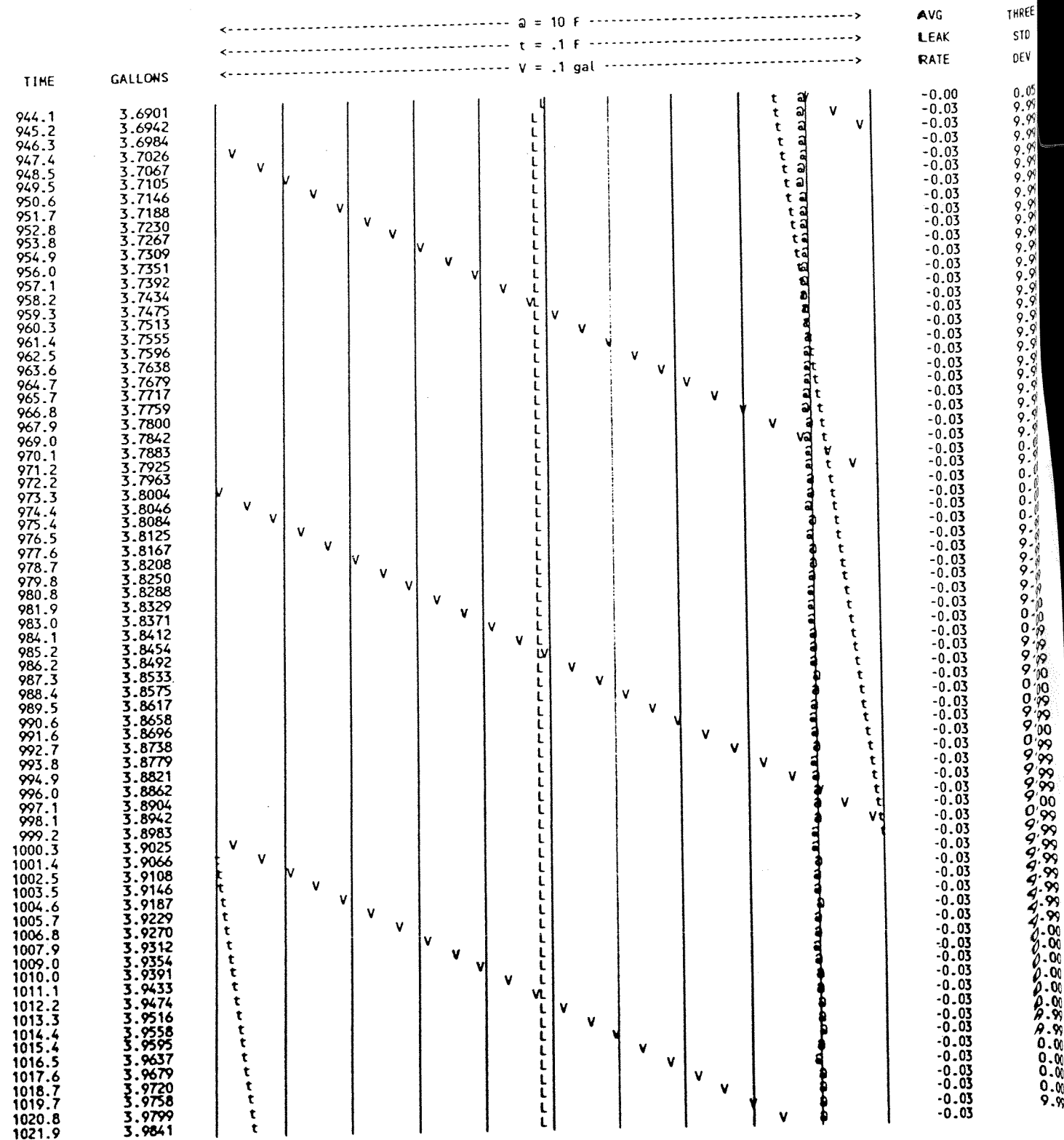
END OF STRIP CHART 90071358.R12 DATA COLLECTED ON LEAK COMPUTER S/N 88121906

00599

STRIP CHART FOR DATA RECORD: 90071459.R10 OF 25000 GALLON JET A TANK @ LARADO INTL AIRPORT, 518 FLIGHTLINE, LARAD

TEST OPERATOR: B.GUARNIERE

LEAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 237.5 MIN / DENSITY: .76 / TANK TEMP @ START: 84 F / COE: .000505



END OF STRIP CHART 90071459.R10 DATA COLLECTED ON LEAK COMPUTER S/N 88121906

00600

STRIP CHART FOR DATA RECORD: 90071461.R10 OF 25000 GALLON JET A TANK @ LAREDO INTL AIRPORT, 518 FLIGHTLINE, LAREDO

TEST OPERATOR: B. GUARNIERE

LEAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 80.4 MIN / DENSITY: .76 / TANK TEMP @ START: 86 F / COE: .000504

		----- a = 10 F -----> ----- t = .1 F -----> ----- V = .1 gal ----->						AVG	THREE
TIME	GALLONS							LEAK	STD
								RATE	DEV
1144.2	3.9273	V						0.01	0.04
1145.2	3.9274	V						0.00	9.99
1146.3	3.9276	V						0.00	0.00
1147.3	3.9277	V						0.00	0.00
1148.3	3.9278	V						0.00	0.00
1149.3	3.9280	V						0.00	0.00
1150.4	3.9281	V						0.00	0.00
1151.4	3.9283	V						0.00	0.00
1152.5	3.9284	V						0.00	0.00
1153.5	3.9286	V						0.00	0.00
1154.5	3.9287	V						0.00	0.00
1155.6	3.9289	V						0.00	0.00
1156.6	3.9290	V						0.00	0.00
1157.7	3.9292	V						0.00	0.00
1158.7	3.9293	V						0.00	0.00
1159.7	3.9294	V						0.00	0.00
1160.8	3.9296	V						0.00	0.00
1161.8	3.9297	V						0.00	0.00
1162.9	3.9299	V						0.00	0.00
1163.9	3.9300	V						0.00	0.00
1164.9	3.9302	V						0.00	0.00
1166.0	3.9303	V						0.00	0.00
1167.0	3.9305	V						0.00	0.00
1168.1	3.9306	V						0.00	0.00
1169.1	3.9308	V						0.00	0.00
1170.1	3.9309	V						0.00	0.00
1171.2	3.9311	V						0.00	0.00
1172.2	3.9312	V						0.00	0.00
1173.3	3.9314	V						0.00	0.00
1174.3	3.9315	V						0.00	0.00
1175.3	3.9316	V						0.00	0.00
1176.4	3.9318	V						0.00	0.00
1177.4	3.9319	V						0.00	0.00
1178.5	3.9321	V						0.00	0.00
1179.5	3.9322	V						0.00	0.00
1180.5	3.9324	V						0.00	0.00
1181.5	3.9325	V						0.00	0.00
1182.6	3.9327	V						0.00	0.00
1183.6	3.9328	V						0.00	0.00
1184.6	3.9330	V						0.00	9.99
1185.7	3.9331	V						0.00	9.99
1186.7	3.9333	V						0.00	9.99
1187.8	3.9334	V						0.00	9.99
1188.8	3.9336	V						0.00	9.99
1189.9	3.9337	V						0.00	9.99
1190.9	3.9339	V						0.00	9.99
1192.0	3.9340	V						0.00	9.99
1193.0	3.9342	V						0.00	9.99
1194.0	3.9343	V						0.00	9.99
1195.1	3.9344	V						0.00	9.99
1196.2	3.9346	V						0.00	9.99
1197.2	3.9347	V						0.00	9.99
1198.2	3.9349	V						0.00	9.99
1199.3	3.9350	V						0.00	9.99
1200.3	3.9352	V						0.00	9.99
1201.4	3.9353	V						0.00	0.00
1202.4	3.9355	V						0.00	9.99
1203.5	3.9356	V						0.00	9.99
1204.5	3.9358	V						0.00	9.99
1205.5	3.9359	V						0.00	9.99
1206.6	3.9361	V						0.00	9.99
1207.6	3.9362	V						0.00	9.99
1208.6	3.9364	V						0.00	9.99
1209.7	3.9365	V						0.00	0.00
1210.7	3.9367	V						0.00	9.99
1211.8	3.9368	V						0.00	9.99
1212.8	3.9370	V						0.00	9.99
1213.8	3.9371	V						0.00	0.00
1214.9	3.9372	V						0.00	0.00
1216.0	3.9374	V						0.00	9.99
1217.0	3.9375	V						0.00	9.99
1218.0	3.9377	V						0.00	9.99
1219.1	3.9378	V						0.00	9.99
1220.1	3.9380	V						0.00	9.99
1221.2	3.9381	V						0.00	9.99

END OF STRIP CHART 90071461.R10 DATA COLLECTED ON LEAK COMPUTER S/N 88121906

00601

STRIP CHART FOR DATA RECORD: 90071562.R12 OF 25000 GALLON JET A TANK @ LAREDO INTL AIRPORT, 518 FLIGHTLINE, LAREDO

TEST OPERATOR: B. GUARNIERE

LEAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 291.1 MIN / DENSITY: .79 / TANK TEMP @ START: 84 F / COE: .000505

		<----- a = 10 F ----->					AVG	
		<----- t = .1 F ----->					LEAK	
		<----- V = .1 gal ----->					RATE	
TIME	GALLONS							THREE STD DEV
952.6	3.2867						-0.02	0.04
953.6	3.2861						0.02	9.99
954.7	3.2855						0.02	9.99
955.7	3.2849						0.02	9.99
956.8	3.2843						0.02	0.00
957.8	3.2837						0.02	0.00
958.9	3.2831						0.02	0.00
959.9	3.2825						0.02	9.99
961.0	3.2818						0.02	9.99
962.0	3.2813						0.02	9.99
963.1	3.2806						0.02	9.99
964.2	3.2800						0.02	9.99
965.2	3.2794						0.02	9.99
966.3	3.2788						0.02	9.99
967.3	3.2782						0.02	9.99
968.3	3.2776						0.02	9.99
969.4	3.2770						0.02	9.99
970.4	3.2764						0.02	9.99
971.4	3.2759						0.02	9.99
972.5	3.2752						0.02	9.99
973.5	3.2746						0.02	0.00
974.5	3.2741						0.02	0.00
975.6	3.2734						0.02	0.00
976.6	3.2729						0.02	0.00
977.7	3.2722						0.02	0.00
978.7	3.2716						0.02	9.99
979.7	3.2711						0.02	0.00
980.8	3.2704						0.02	9.99
981.8	3.2699						0.02	9.99
982.9	3.2692						0.02	9.99
983.9	3.2686						0.02	9.99
984.9	3.2681						0.02	9.99
986.0	3.2674						0.02	0.00
987.0	3.2669						0.02	0.00
988.0	3.2663						0.02	0.00
989.1	3.2656						0.02	0.00
990.1	3.2651						0.02	0.00
991.1	3.2645						0.02	0.00
992.2	3.2639						0.02	0.00
993.2	3.2633						0.02	0.00
994.3	3.2626						0.02	0.00
995.3	3.2621						0.02	0.00
996.4	3.2614						0.02	0.00
997.4	3.2609						0.02	9.99
998.4	3.2603						0.02	9.99
999.5	3.2596						0.02	9.99
1000.5	3.2591						0.02	9.99
1001.5	3.2585						0.02	9.99
1002.6	3.2579						0.02	0.00
1003.6	3.2573						0.02	9.99
1004.7	3.2566						0.02	0.00
1005.7	3.2561						0.02	0.00
1006.7	3.2555						0.02	0.00
1007.8	3.2549						0.02	9.99
1008.8	3.2543						0.02	9.99
1009.9	3.2536						0.02	9.99
1010.9	3.2531						0.02	9.99
1011.9	3.2525						0.02	9.99
1013.0	3.2519						0.02	0.00
1014.0	3.2513						0.02	0.00
1015.0	3.2507						0.02	9.99
1016.1	3.2501						0.02	0.00
1017.1	3.2495						0.02	0.00
1018.2	3.2489						0.02	0.00
1019.2	3.2483						0.02	9.99
1020.2	3.2477						0.02	0.00
1021.3	3.2471						0.02	0.00
1022.3	3.2465						0.02	0.00
1023.3	3.2459						0.02	9.99
1024.4	3.2453						0.02	9.99
1025.5	3.2446						0.02	9.99
1026.5	3.2441						0.02	9.99
1027.5	3.2435						0.02	9.99
1028.6	3.2429						0.02	9.99
1029.6	3.2423						0.02	9.99
1030.6	3.2417						0.02	9.99

END OF STRIP CHART 90071562.R12 DATA COLLECTED ON LEAK COMPUTER S/N 88121906

00602

STRIP CHART FOR DATA RECORD: 90071563.R12 OF 25000 GALLON AVGAS100LL TANK @ LAREDO INTL AIRPORT, 518 FLIGHTLINE, LAREDO

TEST OPERATOR: B. GUARNIERE

LEAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 207.8 MIN / DENSITY: .68 / TANK TEMP @ START: 86 F / COE: .000761

		----- a = 10 F ----->		AVG	THREE
		----- t = .1 F ----->		LEAK	STD
TIME	GALLONS	----- V = .1 gal ----->		RATE	DEV
1344.2	3.5777			-0.03	0.01
1345.2	3.5733			-0.02	9.99
1346.2	3.5688			-0.02	0.00
1347.3	3.5639			-0.02	0.00
1348.3	3.5594			-0.02	0.00
1349.4	3.5544			-0.02	0.00
1350.4	3.5500			-0.02	0.00
1351.4	3.5455			-0.02	0.00
1352.5	3.5406			-0.02	0.00
1353.5	3.5361			-0.02	0.00
1354.6	3.5312			-0.02	0.00
1355.6	3.5267			-0.02	0.00
1356.7	3.5218			-0.02	0.00
1357.7	3.5173			-0.02	0.00
1358.8	3.5123			-0.02	0.00
1359.8	3.5079			-0.02	0.00
1360.8	3.5034			-0.02	0.00
1361.8	3.4989			-0.02	0.00
1362.9	3.4940			-0.02	0.00
1363.9	3.4895			-0.02	0.00
1365.0	3.4846			-0.02	0.00
1366.0	3.4801			-0.02	0.00
1367.1	3.4752			-0.02	0.00
1368.1	3.4707			-0.02	0.00
1369.1	3.4662			-0.02	9.99
1370.2	3.4613			-0.02	9.99
1371.2	3.4568			-0.02	9.99
1372.2	3.4523			-0.02	0.00
1373.3	3.4474			-0.02	0.00
1374.4	3.4425			-0.02	9.99
1375.4	3.4380			-0.02	9.99
1376.5	3.4331			-0.02	9.99
1377.5	3.4286			-0.02	9.99
1378.6	3.4237			-0.02	9.99
1379.6	3.4192			-0.02	9.99
1380.7	3.4143			-0.02	0.00
1381.8	3.4093			-0.02	0.00
1382.8	3.4049			-0.02	0.00
1383.9	3.3999			-0.02	0.00
1384.9	3.3955			-0.02	9.99
1386.0	3.3905			-0.02	0.00
1387.0	3.3861			-0.02	0.00
1388.1	3.3811			-0.02	0.00
1389.1	3.3767			-0.02	9.99
1390.1	3.3722			-0.02	0.00
1391.1	3.3677			-0.02	9.99
1392.2	3.3628			-0.02	9.99
1393.3	3.3578			-0.02	9.99
1394.3	3.3534			-0.02	9.99
1395.4	3.3484			-0.02	9.99
1396.4	3.3440			-0.02	9.99
1397.5	3.3390			-0.02	9.99
1398.5	3.3346			-0.02	9.99
1399.6	3.3296			-0.02	0.00
1400.7	3.3247			-0.02	0.00
1401.7	3.3202			-0.02	0.00
1402.8	3.3153			-0.02	0.00
1403.9	3.3104			-0.02	0.00
1404.9	3.3059			-0.02	0.00
1406.0	3.3010			-0.02	0.00
1407.0	3.2965			-0.02	0.00
1408.1	3.2916			-0.02	0.00
1409.1	3.2871			-0.02	0.00
1410.2	3.2822			-0.02	0.00
1411.2	3.2777			-0.02	0.00
1412.3	3.2728			-0.02	0.00
1413.3	3.2683			-0.02	0.00
1414.4	3.2633			-0.02	0.00
1415.5	3.2584			-0.02	0.00
1416.6	3.2535			-0.02	0.00
1417.6	3.2490			-0.02	0.00
1418.7	3.2441			-0.02	9.99
1419.7	3.2396			-0.02	0.00
1420.8	3.2347			-0.02	9.99
1421.8	3.2302			-0.02	9.99
1422.9	3.2253			-0.02	9.99

END OF STRIP CHART 90071563.R12 DATA COLLECTED ON LEAK COMPUTER S/N 88121906

00603

HOW TO READ AN ACUTEST STRIP CHART

NOTE: The attached Strip Chart example is from an actual test. The only change made was the location name. The test was run for a total of 137 minutes, but printed data are usually confined to the last 70-75 minutes of the test, with each line showing a calculated leak rate based on an average of 250 readings of temperature and volume change during a period of approximately one minute.

DATA RECORD: This line identifies an individual test with a number representing the date (YYMMDD) followed by a two-digit serial number, the alphabetic channel designation and a number representing the height of fluid in the riser in inches. The Tank Volume and Product in the tank and test location are also shown on this line.

OPERATOR NAME: Operator name is shown on the second line.

LEAK RATE AVERAGE (LRA): The number of cycles (minutes) of data used to calculate average leak rate and standard deviation is shown. This number is selected based on the variability of data values, and can be as high as 60 cycles (1 hour of data).

LINE FEED (LFD): This is the travel in inches/hour of the strip chart (e.g. 6.0 vertical inches = 1 hour on the chart).

TOTAL TEST TIME: The number of minutes that data were collected for this test.

DATA CONSTANTS: Coefficient of expansion for the product tested and its measured density are shown on the third line.

AMBIENT TANK TEMPERATURE (θ): The initial value is shown in degrees Fahrenheit in the heading. Subsequent values are recorded on the strip chart according to the scale given in the heading. This variable is plotted for information purposes only, and is not used in calculation of leak rate. Ambient tank temperature increases toward the right.

AVERAGE TANK TEMPERATURE (τ): These symbols record the change in average liquid temperature. Each chart division represents 0.01 degrees F, and positive change is toward the right.

LIQUID VOLUME (V): This is the volume of liquid in the measuring cylinder. The amount at the end of each cycle is given under the column titled GAL and is plotted on the strip chart with each division line representing a change of 0.01 gallons. Movement to the left means liquid added to the underground tank in order to maintain a constant level (i.e., underground liquid volume is decreasing).

LEAK RATE (L): The leak rate is the average value of leak rate for the number of cycles shown in the heading. Each cycle is, in turn, an average of 150 actual measurements and is printed out as one line on the strip chart. The leak rate value is printed out in gal/hr near the right edge of the chart.

Zero for the plotted value of leak rate is the center of the strip chart. Each division line represents 0.2, 2 or 20 gal/hr, depending upon the calculated value of average leak rate. A positive leak rate value is a leak out of the tank and will plot toward the right of the center line. A negative leak rate value is an "in-leak" (e.g. drain-back from a pipe or the effect of a vapor pocket) and will plot toward the left of the center line.

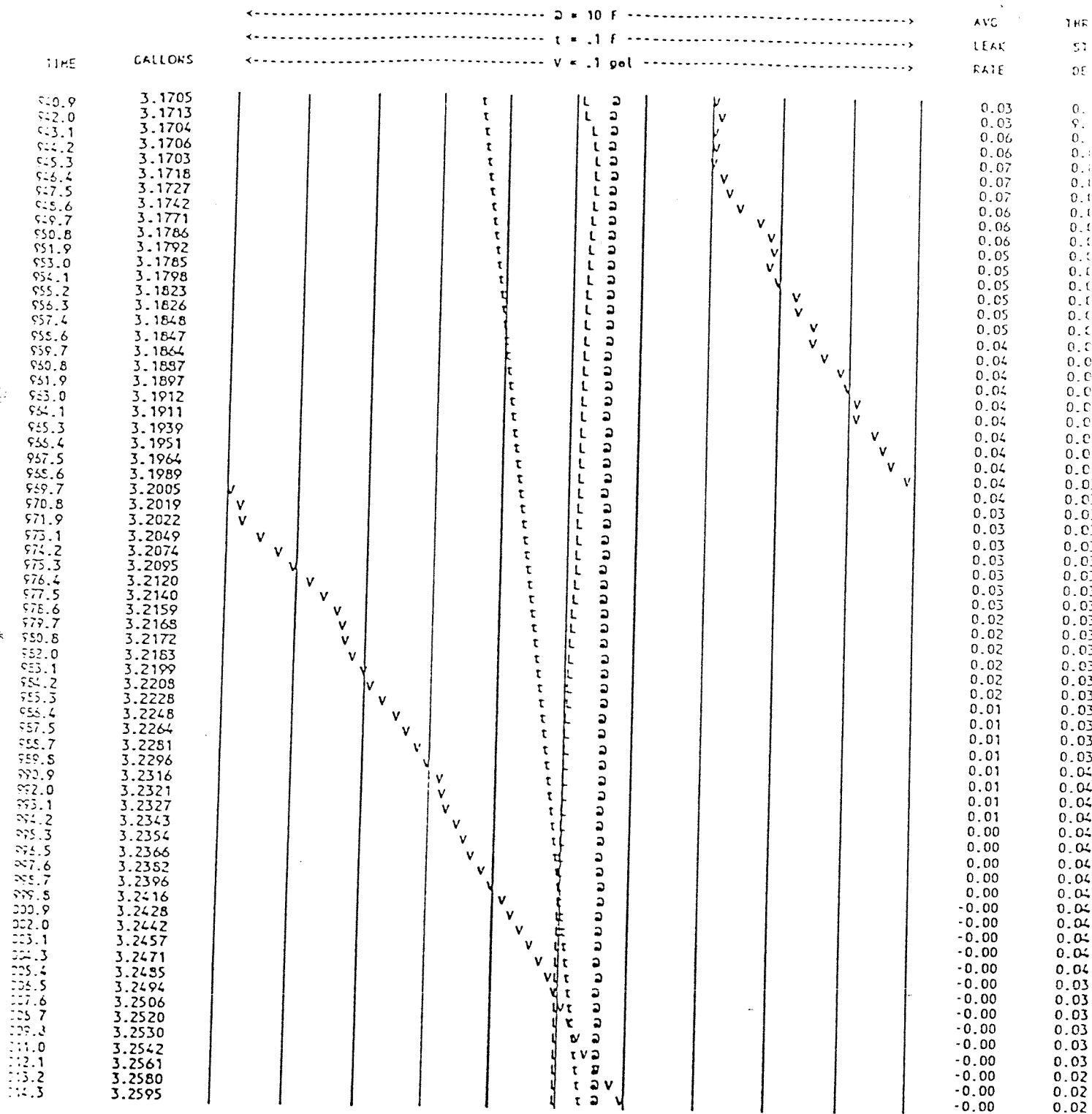
NOTE: The starting point for plotting of each variable except leak rate is arbitrary, and has no significance regarding absolute value since only change is being plotted.

THREE TIMES STANDARD DEVIATION. THE STANDARD DEVIATION (a statistical measure) of leak rate for the number of cycles used to calculate the average leak rate (usually 30) is calculated once per cycle and multiplied by 3. The smaller this number becomes, the less random variation there is in the sampled data and the greater confidence that the leak rate has stabilized and is accurate. For example, a leak rate of .20 with a THREE TIMES STANDARD DEVIATION of .04 means we are 99% sure that the true value of leak rate will lie in the range .20 $\pm$.04 or between .24 and .16 gal/hr. Conversely, there is only a 1% chance it will fall outside that range, and the MOST LIKELY VALUE is the calculated leak rate of .20 gal/hr.

STRIP CHART FOR DATA RECORD: 90022854.C05 OF 8000 GALLON PLUS TANK 2 AL'S DEEP ROCK BELLEVUE, LA.

TEST OPERATOR: MIKE VIGIL-ROY ONSTOTT

LEAK RATE AVG OF 30 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 137.1 MIN / DENSITY: .71 / TANK TEMP 2 START: 67 F / COE: .0006



END OF STRIP CHART 90022854.C05 DATA COLLECTED ON LEAK COMPUTER S/N 89061305

00606