

MX SITING INVESTIGATION
WATER RESOURCES PROGRAM
TECHNICAL SUMMARY REPORT
VOLUME I

Prepared for:

U.S. Department of the Air Force
Ballistic Missile Office
Norton Air Force Base, California 92409

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WELL NUMBER	VALLEY	LOCATION #	COMPLETION INTERVAL (FT BLS)	DEPTH OF WELL (FT)	WELL CASING (IN)	STATIC WATER LEVEL (FT BLS)	DURATION OF TEST (HR)	DIST TO DR - WELL (FT)	DIS-CHARGE (GPM)	PA1 DRAINAGE (FT BLS)	TRANS-MISSIVITY (50 FT PER DAY)	STORATIVITY INITIAL/DELAYED	METHOD OF ANALYSIS	LITHO LOGIC COND #	
BL-VF-T1 BL-VF-T1	BERYL, UTAH	1C-33-17121002	180-240 240-340	353	10	183.4	240P 175P	200	600	14.1	13000	DNA DNA	RECOVERY	U	
BL-VF-O-1S BL-VF-O-1D	BERYL	1C-33-17121001	189-231 239-332	236	2	173.6	240P 47B 240P 47B			0.0	NC	NC NC	NONE SEVERAL	U U	
BE-VF-T1 9C-VF-T1	BIG SAND SPRINGS	8N/33E-29DA2	487-547 553-573	372	10	467.8	240P 36.5R	190 190	433 410	64.4	2000 1800	DNA DNA	DNA DNA	JACOB RECOVERY	U
BO-VF-O-1S BO-VF-O-1D	BIG SAND SPRINGS	8N/33E-29DA1	472-493 607-649	493	2	471.6	240P 36.5R 240P 36.5R			0.0	NC	NC NC	NONE	U	
CV-I-T-1 CV-I-T-1	CAVE, NEVADA	7N/63E-14AB2	210-250 375-435	433	10	229.0	160P 20R	500	225	114.8	8800	DNA DNA	RECOVERY	C	
CV-I-O-1S CV-I-O-1D	CAVE	7N/63E-14AB1	200-263 380-422	273	2	231.2	160P 20R 160P 20R			3.6	2400	9.2E-5 1.3E-2	NEUMAN RECOVERY	C U	
CL-VF-T-1A CL-VF-T-1A	COAL, NEVADA	1S/59E-24CB2	1111-1313	1313	10	843.4	240P 75R	550	450	69.4	3200	DNA DNA	RECOVERY	U	
CL-VF-O-1	COAL	1S/59E-24CB1	1142-1452	1452	2	862.4	240P 75R			6.1	3700 7000	4.0E-4 DNA	1.3E-3 DNA	NEUMAN RECOVERY	U
DN-TM-2 DN-TM-2	DELAMAR, NEVADA	4S/63E-12AD2	930-980 1040-1180	1190	10	871.0	67P 26.6R	500	85	85.3	NC	DNA DNA	SEVERAL	U	
DN-OV-2S DN-OV-2D	DELAMAR	4S/63E-12AD1	340-630 816-847 877-940 930-971	640	2	867.3	83P 26.6R 83P 26.6R			0.0 5.3	NC 1100 1300	NC DNA DNA	NC JACOB RECOVERY	U U U	
DL-TM-2 DL-TM-2	DRY LAKE, NEVADA	3S/64E-12AC2	400-620 650-670 700-730 750-770 800-820 850-870 900-920 950-970	690	10	399.0	230P 155R	475	500	44.8	2700 NC	DNA DNA	DNA DNA	JACOB RECOVERY	U
DL-OV-2S DL-OV-2D	DRY LAKE	3S/64E-12AC1	765-785 1270-1290	795	2	383.3	230P 155R 230P 155R			7.3 4.4	3400 3200 3700 6500	3.3E-4 DNA 3.9E-3 DNA	1.3E-2 DNA 3.1E-2 DNA	NEUMAN RECOVERY NEUMAN RECOVERY	U U
GN-TT-2 GN-TT-2	GARDEN, NEVADA	2N/57E-22BA2	600-620 650-670 700-730 750-770 800-820 850-870 900-920 950-970	1010	10	422.0	720P 72R	700	510	23.0	3200 13000	DNA DNA	DNA DNA	JACOB RECOVERY	U
GN-10-1S GN-10-1D	GARDEN	2N/57E-22BA1	273-294 820-841 870-911 920-951 990-1011	319	2	431.1	720P 72R			0.0 4.0	NC 12000 19000	NC 6.4E-4 DNA	NC 2.3E-3 DNA	NONE NEUMAN RECOVERY	U
HN-ST-1 HN-ST-1	HARLIN, NEVADA	8N/69E-33DC2	320-440	473	10	137.6	120P 24R	300	110	82.9	62 60	NC DNA	NC DNA	JACOB RECOVERY	U
HN-SD-1	HARLIN	8N/69E-33DC1	320-420	435	2.5	175.6	120P 24R			1.6	2500 10000	1.9E-4 DNA	1.3E-2 DNA	NEUMAN RECOVERY	U
HC-ST-1 HC-ST-1	HOT CREEK, NEV	7N/31E-10AD1	80-100 140-180 200-220 240-260 280-320 340-360 380-400 420-460	480	10	237.1	97P 19R	500	235	45.0	8100	DNA DNA	DNA DNA	RECOVERY	U
HC-SD-1	HOT CREEK	7N/31E-10AD2	220-240 300-320 340-360 380-400 420-460	480	2.5	236.1	97P 19R			0.4	19000	1.3E-3 DNA	3.0E-2 DNA	NEUMAN	U
HC-S-T-2 HC-S-T-2	HOT CREEK, NEVADA	6N/50E-27AC1	383-385 385-405 425-485	503	10	292.1	120P 6R	500	375	126.1	2900	DNA DNA	RECOVERY	U	
HC-S-D-2	HOT CREEK	6N/50E-27AC2	286-420	453	2.5	303.3	120P 6R			10.3	1600 9100	1.4E-4 DNA	4.1E-3 DNA	NEUMAN RECOVERY	U
HD-VF-T-1 HD-VF-T-1	HILFORD, UTAH	1C-31-1315B1	99-139 173-193	374	10	30.7	240P 97R	386	350	87.2	2700	DNA DNA	DNA DNA	RECOVERY	U
HD-VF-O-1S HD-VF-O-1D	HILFORD	1C-31-1315B2	99-139 300-342	342	2.5	31.0	240P 87R 240P 87R			4.9 0.0	2400 6400 NC	4.3E-4 DNA NC	8.0E-2 DNA NC	NEUMAN RECOVERY NONE	U
HS-VF-T-1 HS-VF-T-1	HULESHOE, NEVADA	4N/64E-70C2	1050-1150	1170	10	268.4	144P 48R	350	80	314.6	15 44	DNA DNA	DNA DNA	JACOB RECOVERY	U
HS-VF-O-1S HS-VF-O-1D	HULESHOE	4N/64E-70C1	430-672	672	2	270.0	144P 48R			0.0	NC	NC NC	NC NC	NONE	U
HS-VF-O-1D	HULESHOE	4N/64E-70C1	1071-1134	1134	2	264.2	144P 48R			34.9	39 126	1.0E-4 DNA	6.2E-4 DNA	NEUMAN RECOVERY	U
P1-TT-2	PINE	1C-26-17110AA2	560-630 660-680 710-740 780-770 800-820 830-850	870	10	443.0	167P 120R	452	75	105.3	320	DNA DNA	DNA DNA	RECOVERY	U
P1-10-1	PINE	1C-26-17110AA1	640-661 760-802 840-861	882	2	434.0	167P 120R			9.2	300 420	2.2E-4 DNA	1.4E-3 DNA	NEUMAN RECOVERY	U

Ertec
The Earth Technology Corporation

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WELL AND AQUIFER TEST DATA
PAGE 1 OF 2

WELL NUMBER	VALLEY	LOCATION	COMPLETION INTERVAL (FT BLS)	DEPTH OF WELL (FT)	WELL CASING ID (IN)	STATIC WATER LEVEL (FT BLS)	DURATION OF TEST (HR)	DIST TO OR WELL (FT)	DIS-CHARGE (CPH)	MAX DRAWDOWN (FT BLS)	TRANS-MISSIVITY (SQ FT PER DAY)	STORATIVITY INITIAL	STORATIVITY DELAYED	METHOD OF ANALYSIS	LITHO LOGIC COND	
HR-S-1-1	RAILROAD	NEVADA	3M/52E-20A1	302-202 404-444	441	10	230 2	216P 24R	411	733	19 0	17000	DNA	DNA	RECOVERY	U
HR-S-0-1	RAILROAD		3M/52E-20A2	375-493	493	2 5	234 4	216P 24R		3 2	11000 17000	1 2E-4 DNA	1 4E-2 DNA	NEUMAN* RECOVERY	U	
HR-S-1-2	RAILROAD	NEVADA	10H/58E-17802	278-329 380-420 441-560	380	10	280 6	676P 103R	490	705	66 7	31000	DNA	DNA	RECOVERY	U
HR-S-0-2-S	RAILROAD		10H/58E-17801	94-200	220	2	DRY	676P 103R								
RR-S-0-7-D	RAILROAD		10H/58E-17801	300-328 349-370 391-412 433-474 510-526 556-578	400	2	280 0	676P 103R		8 0	7900 28000	3 2E-4 DNA	1 1E-3 DNA	NEUMAN* RECOVERY	U	
RE-VF-1	REVEILLE	NEVADA	3M/50E-13CA2	298-418 450-478 499-519 550-579 618-638	680	10	316 3	170P 72R	500	530	90 3	11200	DNA	DNA	RECOVERY	U
RE-VF-01D	REVEILLE		3M/50E-13CA1	660-702 6	702 6	2	321 1	170P 72R		6 4	10000 11450 3000 15900	2 2E-4 DNA	1 6E-3 DNA	NEUMAN* RECOVERY	U	
RE-VF-01S	REVEILLE		3M/50E-13CA1	284-405	405 2		321 1	170P 72R		6 4	3000 15900	1 2E-4 DNA	1 2E-2 DNA	NEUMAN* RECOVERY	U	
SP-S-1-1	SPRING	NEVADA	9M/60E-30AB1	559-679	679	10	229 8	120P 48R	560	600	16 0	NC	DNA	DNA	RECOVERY	U
SP-S-1-1	SPRING		9M/60E-30AB2	163-247	247 2		DRY	120P 48R		0 0	NC	NC	NC	NONE	U	
SP-S-0-1S	SPRING		9M/60E-30AB1	553-700	700 2		219 3	120P 48R		0 7	NC	NC	NC	NONE	U	
TL-S-1-1	TULE	UTAH	1C-20-1416DD1	500-600	620	10	84 3	72 1P 36 7R	500	30	296 5	NC	DNA	DNA	SEVERAL	C
TL-S-1-1	TULE		1C-20-1416DD2	500-600	620	2 3	88 8	72 1P 36 7R			2 2	NC	NC	NC	JACOB	C
TL-S-1-2	TULE	UTAH	1C-17-15117CA1	100-180 240-280 360-380	400	10	47 3	120P 24R	300	235	1 0	NC	DNA	DNA	RECOVERY	U
TL-S-0-2	TULE		1C-17-15117CA2	36-276	296	2 3	53 0	120P 24R			0 2	NC	NC	NC	JACOB	U
WA-11-2	WASH WASH	UTAH	1C-27-14128DD2	905-943 995-1015 1110-1190 1220-1300 1310-1330	1330	10	570 4	239 7P 24 OR	305	375	193 9	NC	DNA	DNA	RECOVERY	U
WA-10-2	WASH WASH		1C-27-14128DD1	693-987	987	2	549 0	239 7P 24R		1 1	12000 16000	1 8E-3 DNA	1 4E-1 DNA	NEUMAN* RECOVERY	U	
WH-11-1	WHIRLWIND	UTAH	1C-13-12119AD2	710-720 823-905 975-1005	1023	10	797 6	96P 24R	500	7	101 3	4 0	DNA	DNA	RECOVERY	U
WH-10-1	WHIRLWIND		1C-13-12119AD1	1044-1086 1107-1170	1191	2	794 4	96P 24R		0 0	NC	NC	NC	NONE	U	

- (1) A "T" OR AN "O" IN THE SECOND OR THIRD PORTION OF THE WELL NUMBER INDICATES THE WELL IS EITHER A TEST WELL OR AN OBSERVATION WELL. THE PRESENCE OF A "D" OR "S" NEAR THE END OF THE WELL NUMBER INDICATES THE WELL IS EITHER A DEEP OR SHALLOW PIEZOMETER.
- (2) THE LAST DIGIT OF THE "LOCATION" REFERS TO THE ORDER OF DRILLING AT THIS LOCATION.
- (3) FEET BELOW LAND SURFACE (FT BLS)
- (4) INITIAL COMPRESSIBLE STORAGE
- (5) MINIMUM VALUE OF SPECIFIC YIELD BASED ON LAST DATUM POINT. THE THIRD "LEG" OF THE SEMILOD GRAPH MAY NOT BE PRESENT.
- (6) LITHOLOGIC CONDITIONS WERE INTERPRETED FROM GEOPHYSICAL AND DRILLER'S LOGS. A "C" IN THIS COLUMN INDICATES CONFINED AQUIFER CONDITIONS AND "U" INDICATES UNCONFINED CONDITIONS.
- (7) DURATION OF PUMPING
- (8) DURATION OF RECOVERY
- (9) DOES NOT APPLY
- (10) REFERS TO THE ANALYSIS OF A SEMILOD GRAPH OF RESIDUAL DRAWDOWN VERSUS TIME AS OUTLINED BY THEIS (1928).
- (11) NOT CONCLUSIVE
- (12) BECAUSE DRAWDOWN WAS NOT OBSERVED IN THE OBSERVATION WELL, NO ANALYSIS WAS PERFORMED.
- (13) SEVERAL METHODS WERE APPLIED INCLUDING THE THEIS RECOVERY, NEUMAN, AND JACOB STRAIGHTLINE PROCEDURES.
- (14) REFERS TO THE SEMILOD STRAIGHTLINE ANALYSIS OF DRAWDOWN VERSUS TIME (JACOB (1946)).
- (15) ALL EXPONENTS OF 10 ARE REPRESENTED AS "E" IN E.g. 1E-3 = 10⁻³.
- (16) REFERS TO THE LOG LOG ANALYSIS OF DRAWDOWN VERSUS TIME FOR UNCONFINED AQUIFERS. CONSIDERING DELAYED DRAINAGE (NEUMAN, 1973).
- (17) LITHOLOGIC LOGS INDICATE THAT CONFINED CONDITIONS MAY BE PRESENT IN THE VALLEY-FILL AQUIFER AT THIS TEST SITE. HOWEVER, DRAWDOWN VERSUS TIME DATA COLLECTED DURING THE AQUIFER TEST INDICATES SEMICONFINED TO UNCONFINED CONDITIONS ARE PRESENT. AS A RESULT, THE NEUMAN METHOD OF ANALYSIS WAS USED.
- (18) AFTER WELL DEVELOPMENT, A WATER-LEVEL MEASUREMENT OF THE PIEZOMETER INDICATED THE WELL WAS DRY.
- (19) WELL CASING TELESCOPED TO THIS DIAMETER AT THE CORRESPONDING COMPLETION INTERVAL.

* NOT ADDRESSED IN TECHNICAL SUMMARY.



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WELL AND AQUIFER TEST DATA
PAGE 2 OF 2

CARBONATE EXPLORATION WELLS							
WELL	LOCATION	WELL CHARACTERISTICS		FORMATIONS PENETRATED - DEPTH IN FEET		PRELIMINARY AQUIFER TEST RESULTS	
CV - DT - 1	COAL VALLEY NYE CO., NEVADA 3 N / 59 E - 10	DEPTH (FT.) - 1837	DIAMETER (INCHES)	0 - 103	ALLUVIUM	TYPE TEST	STEP-DRAWDOWN
		0 - 118	13 3/4	103 - 455	CHAINMAN SHALE (MISSISSIPPIAN)	TEST DISCHARGE	CONSTANT DISCHARGE
		118 - 1837	7 7/8		FAULT	DRAWDOWN	95 gpm
		STATIC WATER LEVEL	803 ft	455 - 1835	GUILMETTE FORMATION (DEVONIAN)	SPECIFIC CAPACITY	63 ft
		TEMPERATURE	26 °C			TRANSMISSIVITY	1.5 gpm/ft.
		AVERAGE T.D.S.	260 mg/l				400 ft. ² /day (estimated)
SV - DT - 2	STEPTOE VALLEY WHITE PINE CO., NEVADA 12 N / 63 E - 12 ba	DEPTH (FT.) - 2447	DIAMETER (INCHES)	0 - 920	ELY LIMESTONE (PENNSYLVANIAN)	TYPE TEST	STEP-DRAWDOWN
		0 - 50	12		THRUST FAULT	TEST DISCHARGE	CONSTANT DISCHARGE
		50 - 2447	7 7/8	920 - 2447	CHAINMAN SHALE (MISSISSIPPIAN)	DRAWDOWN	100 gpm
		STATIC WATER LEVEL	427 ft			SPECIFIC CAPACITY	124 ft
		TEMPERATURE	12 °C			TRANSMISSIVITY	0.8 gpm/ft.
		AVERAGE T.D.S.	302 mg/l				200 ft. ² /day (estimated)
DL - DT - 3	DRY LAKE VALLEY LINCOLN CO., NEVADA 3 N / 63 E - 27 ca	DEPTH (FT.) - 2395	DIAMETER (INCHES)	0 - 195	ALLUVIUM	TYPE TEST	STEP-DRAWDOWN
		0 - 347	13 3/4	195 - 335	VOLCANICS	TEST DISCHARGE	CONSTANT DISCHARGE
		347 - 2395	9 7/8	335 - 2060	GUILMETTE FORMATION (?) (DEVONIAN)	DRAWDOWN	106 gpm
		STATIC WATER LEVEL	853 ft	2060 - 2395	SIMONSON DOLOMITE (?) (DEVONIAN)	SPECIFIC CAPACITY	2 ft
		TEMPERATURE	27 °C			TRANSMISSIVITY	50 gpm/ft.
		AVERAGE T.D.S.	366 mg/l				13,400 ft. ² /day (estimated)
CE - DT - 4	COYOTE SPRING VALLEY CLARK CO., NEVADA 13 S / 63 E - 23 dd	DEPTH (FT.) - 669	DIAMETER (INCHES)	0 - 30	ALLUVIUM	TYPE TEST	STEP-DRAWDOWN
		0 - 53	13 3/4	30 - 669	MONTE CRISTO LIMESTONE (MISSISSIPPIAN)	TEST DISCHARGE	CONSTANT DISCHARGE
		53 - 669	9 7/8			DRAWDOWN	540 gpm
		STATIC WATER LEVEL	353 ft	30 - 580	ANCHOR MEMBER	SPECIFIC CAPACITY	3.5 ft
		TEMPERATURE	34 °C	580 - 669	DAWN MEMBER	TRANSMISSIVITY	155 gpm/ft.
		AVERAGE T.D.S.	491 mg/l				40,000 ft. ² /day (estimated)