

Technical Report on the Clayton Valley Lithium Property

Esmeralda County, Nevada

prepared for

Rodinia Minerals Inc.
600 - 595 Howe St.
Vancouver, B.C. V6C 2T5

prepared by

John Harrop, P.Geol.
Coast Mountain Geological Ltd
Suite 620 – 650 West Georgia St.
Vancouver, B.C. V6B 4N9

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Summary

Lithium rich brines and evaporites have been accumulating in playas of Clayton Valley for at least 33,000 years. Clayton Valley brines have the highest lithium content of any brines tested by the US Geological Survey in playas and basins of the southwestern United States.

Clayton Valley contains the only operating lithium mine in the United States, and the only lithium brine operation in North America. This mine has been in continuous production since 1967. Production and resource figures for the lithium mine are proprietary. Total production and resources were estimated to be in the order of 90,000 tonnes Li in 1991 (25,600 tonnes Li produced and 65,000 tonnes Li reserves¹). Estimates of the mineral endowment for lithium within the Clayton Valley catchment area are substantially higher. Motivated by proximity to active mining and the potential for undiscovered lithium, exploration of Clayton Valley is attempting to identify 1) extension to the brine pools currently being mined, 2) lithium in solid phases potentially amenable to solution mining and 3) additional traps that may host unexploited brines.

Introduction and Terms of Reference

Coast Mountain Geological Ltd was retained by Mr. Donald Morrison, President of Rodinia Minerals Inc (RM:TSX-V) to prepare an NI43-101 compliant technical report summarizing the history of their Clayton Valley lithium property. Rodinia Minerals Inc is focused on exploring for clean energy resources such as lithium and uranium. In addition to Nevada, Rodinia is also active in Arizona and Utah. The author is a senior geologist employed by Coast Mountain Geological Ltd.

No work has yet been conducted by Rodinia on the property. This report was commissioned to summarize available geological data. Clayton Valley was visited by the author on 24 September 2008.

Units and Abbreviations

This report uses metric units whenever possible and falls back to Imperial measure when it is necessary to preserve historical context. All references to dollars are in US Dollars unless otherwise indicated.

Short	Long Form	Notes
Å	Ångström	0.1 nanometre or 1×10^{-10} m
Cs	Cesium	
K	Potassium	
Li	Lithium	

¹ These reserve values are not compliant with CIM standards and are only presented as published historical estimates.

Short	Long Form	Notes
Li ₂ CO ₃	Lithium Carbonate	
mg/l	milligrams per litre	mg/l is approximately equivalent to ppm
Na	Sodium	
ppb	parts per billion	
ppm	parts per million	
Rb	Rubidium	
	tonnes	1,000 kg

Lithium Units

Confusion can result from the various ways that lithium quantities and concentrations have been reported in scientific and business publications. In this report lithium is reported as elemental, metal quantities. Lithium is a volatile metal that reacts with the atmosphere. Thus it is usually distributed in a chemical form such as lithium carbonate (Li₂CO₃) and production figures are often quoted in lithium carbonate equivalent quantities. By weight, approximately 18.8% of lithium carbonate is lithium. Therefore, 1 kg of lithium is the equivalent of 5.3 kg of lithium carbonate.

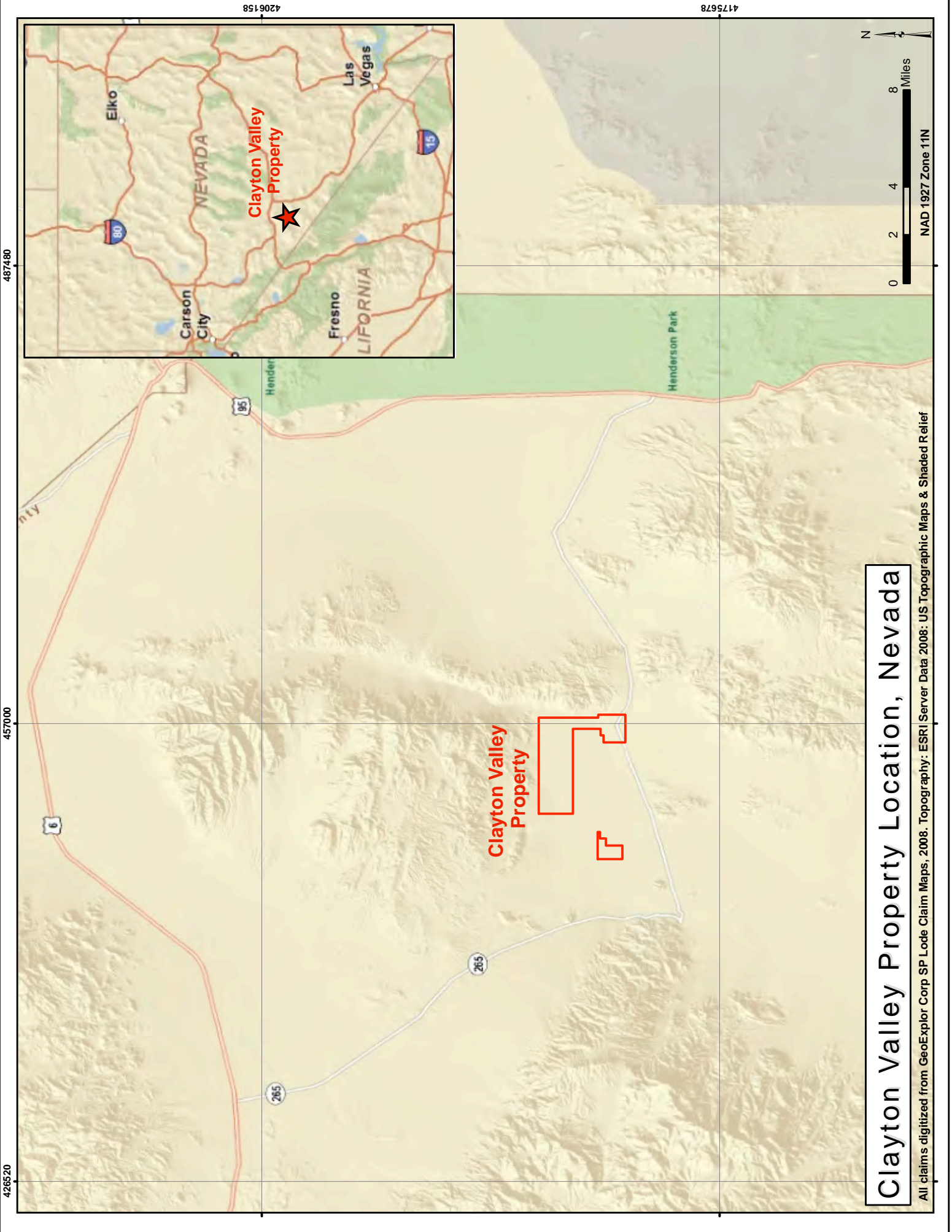
Reliance on other Experts

The author has relied on material and information supplied by Rodinia Minerals Inc and GeoXplor Corp. Location data for the claims has been supplied by GeoXplor Corp. Documentation regarding title of the claims was provided in the form of an agreement between Rodinia and GeoXplor, but has only been confirmed by comparison with the online BLM database.

Property Description and Location

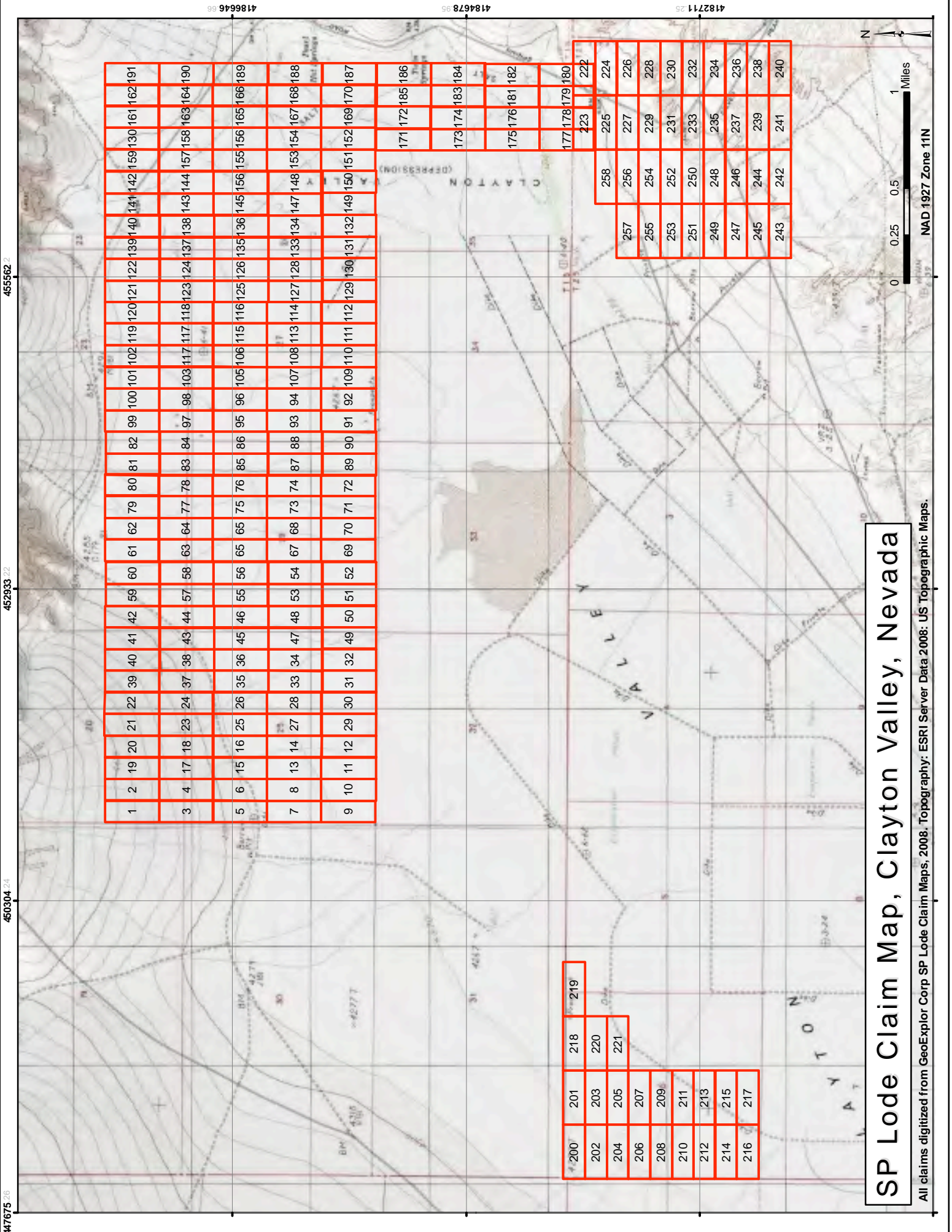
Clayton Valley is located in the centre of Esmeralda County, Nevada, approximately 70 kilometres west of Goldfield, the county seat, and approximately 88 kilometres southwest of Tonopah the largest nearby town.

The property consists of 250 (20 acre) claims on BLM administered land totaling 5,000 acres. The claims fall on Goat Island and Paymaster Ridge 1:24,000 scale map sheets which are within the Goldfield 1:100,000 scale map sheet. During the site visit the vendor was not available to show how their staking had been conducted in the field. However, subsequent spot checks with the BLM database for individual claims indicate six of the claims have not yet been registered. All other claims are registered and appear to currently be in good standing. A legal opinion regarding



Clayton Valley Property Location, Nevada

All claims digitized from GeoExplorer Corp SP Lode Claim Maps, 2008. Topography: ESRI Server Data 2008: US Topographic Maps & Shaded Relief



447675 26 450304 24 452933 22 455562 22

4186646 66 4184678 95 4182711 25

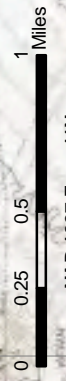
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SP Lode Claim Map, Clayton Valley, Nevada

All claims digitized from GeoExplorer Corp SP Lode Claim Maps, 2008. Topography: ESRI Server Data 2008; US Topographic Maps.



NAD 1927 Zone 11N

the status of the claims has not been sought for this report. The author is not aware of any issues, environmental liabilities or encumbrances regarding the claims.

Claim Name	BLM Serial Number	Docket Number	Book	Page
SP1	NMC998862	171576	269	1
SP2	NMC998863	171577	269	2
SP3	NMC998864	171578	269	3
SP4	NMC998865	171579	269	4
SP5	NMC998866	171580	269	5
SP6	NMC998867	171581	269	6
SP7	NMC998868	171582	269	7
SP8	NMC998869	171583	269	8
SP9	NMC998870	171584	269	9
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SP11	NMC998872	171586	269	11
SP12	NMC998873	171587	269	12
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SP130	NMC998985	171705	269	130
SP131	NMC998986	171706	269	131
SP132	NMC998987	171707	269	132
SP133	NMC998988	171708	269	133
SP134	NMC998989	171709	269	134
SP135	NMC998990	171710	269	135
SP136	NMC998991	171711	269	136
SP137	NMC998992	171712	269	137
SP138	NMC998993	171713	269	138
SP139	NMC998994	171714	269	139
SP140	NMC998995	171715	269	140
SP141	NMC998996	171716	269	141
SP142	NMC998997	171717	269	142
SP143	NMC998998	171718	269	143
SP144	NMC998999	171719	269	144
SP145	NMC999000	171720	269	145
SP146	NMC999001	171721	269	146
SP147	NMC999002	171722	269	147
SP148	NMC999003	171723	269	148
SP149	NMC999004	171724	269	149
SP150	NMC999005	171725	269	150
SP151	NMC999006	171726	269	151
SP152	NMC999007	171727	269	152
SP153	NMC999008	171728	269	153
SP154	NMC999009	171729	269	154
SP155	NMC999010	171730	269	155
SP156	NMC999011	171731	269	156
SP157	NMC999012	171732	269	157
SP158	NMC999013	171733	269	158
SP159	NMC999014	171734	269	159
SP160	NMC999015	171735	269	160
SP161	NMC999016	171736	269	161
SP162	NMC999017	171737	269	162
SP163	NMC999018	171738	269	163
SP164	NMC999019	171739	269	164
SP165	NMC999020	171740	269	165
SP166	NMC999021	171741	269	166
SP167	NMC999022	171742	269	167
SP168	NMC999023	171743	269	168

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SP169	NMC999024	171744	269	169
SP170	NMC999025	171745	269	170
SP171	NMC999026	171746	269	171
SP172	NMC999027	171747	269	172
SP173	NMC999028	171748	269	173
SP174	NMC999029	171749	269	174
SP175	NMC999030	171750	269	175
SP176	NMC999031	171751	269	176
SP177	NMC999032	171752	269	177
SP178	NMC999033	171753	269	178
SP179	NMC999034	171754	269	179
SP180	NMC999035	171755	269	180
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SP182	NMC999037	171757	269	182
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SP184	NMC999039	171759	269	184
SP185	NMC999040	171760	269	185
SP186	NMC999041	171761	269	186
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SP200	NMC999047	171553	268	409
SP201	NMC999048	171553	268	410
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SP205	NMC999052	171553	268	414
SP206	NMC999053	171553	268	415
SP207	NMC999054	171553	268	416
SP208	NMC999055	171553	268	417
SP209	NMC999056	171553	268	418
SP210	NMC999057	171553	268	419
SP211	NMC999058	171553	268	420
SP212	NMC999059	171553	268	421
SP213	NMC999060	171553	268	422
SP214	NMC999061	171553	268	423
SP215	NMC999062	171553	268	424
SP216	NMC999063	171553	268	425
SP217	NMC999064	171553	268	426
SP218	NMC999065	171553	268	427
SP219	NMC999066	171553	268	428

Claim Name	BLM Serial Number	Docket Number	Book	Page
SP220	NMC999067	171553	268	429
SP221	NMC999068	171553	268	430
SP222	NMC999069	171768	269	192
SP223	NMC999070	171769	269	193
SP224	NMC999071	171770	269	194
SP225	NMC999072	171771	269	195
SP226	NMC999073	171772	269	196
SP227	NMC999074	171773	269	197
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SP246	NMC999093	171792	269	216
SP247	NMC999094	171793	269	217
SP248	NMC999095	171794	269	218
SP249	NMC999096	171795	269	219
SP250	NMC999097	171796	269	220
SP251	NMC999098	171797	269	221
SP252	NMC999099	171798	269	222
SP253	NMC999100	171799	269	223
SP254	NMC999101	171800	269	224
SP255	NMC999102	171801	269	225
SP256	NMC999103	171802	269	226
SP257	NMC999104	171803	269	227
SP258	NMC999105	171804	269	228

An annual claim maintenance fee of \$100 per claim, totaling \$25,000 for the subject claims, is required on or before 1 September 2009. Subsequent years will require similar payments by the same date.

In an agreement dated 10 February 2009, between Rodinia Minerals Inc., Donnybrook Platinum Resources Inc. (a wholly owned Wyoming subsidiary of Rodinia) and GeoXplor Corp, Rodinia has the right to earn 100% interest in the subject claims and other claims staked by these companies within Clayton Valley. GeoXplor retains a 3% Lithium Carbonate Production Royalty which may be bought down by Rodinia. Aggregate payments by the fourth anniversary of the agreement include \$322,000 to GeoXplor, issue 2,500,000 common shares to GeoXplor and \$2,000,000 expenditure as work on the property.

In addition to the subject claims, Rodinia through its US subsidiary has staked an additional 284 placer claims (45,440 acres). Under the agreement with GeoXplor, these claims become part of the Clayton Valley property. The combined area is now approximately 50,440 acres. Although these additional claims are not directly the subject of this report, geological discussion and exploration concepts in this report are applicable to them.

Accessibility, Climate, Local Resources, Infrastructure and Physiography

The small settlement of Silver Peak is situated in Clayton Valley adjacent to the Silver Peak Operations lithium mine. Tonopah, the closest major support centre, is approximately 55km northeast of the property, or 95km by road. The majority of this distance is in on good paved road with only the last few kilometres on gravel or dirt roads. Goldfield, the county seat, is approximately 30km east of the property. Direct access to the property from this direction is by secondary, unpaved roads.

Clayton Valley a broad, open playa valley surrounded by rolling to rugged hills and ranges. Vegetation is sparse, but with sufficient scrub to possibly support biogeochemical methods. Temperatures range from average highs of 35°C (95°F) in August to average lows of -8°C (17.5°F) in December. Precipitation averages 11.2 cm annually with 6.9 cm of snowfall. Annual evaporation exceeds 127 cm of which the majority occurs in a five month period. There is not sufficient snow to prevent work in the winter months.



Figure 1 View across Clayton Valley looking northeast.

Clayton Valley lies within the Basin and Range Province, a large geographical and geological region that covers most of Nevada and parts of adjacent states. This region is characterized by north-south oriented ridges and valleys. Clayton Valley is a topographic low with respect to adjacent valleys. Immediately to the south and west is the Silver Peak Range and Palmetto Mountains, to the east is Clayton Ridge and Montezuma Range, and to the north is Paymaster Ridge and Weepah Hills. There has been some suggestion that adjacent valleys may drain onto Clayton Valley. Clayton Valley has a base of 1300m with elevations ranging to 2,880m at Piper Peak in the Silver Peak Range. Adjacent valleys are at 1450m (Big Smokey Valley to the north), 1464m (Alkali Lake to the northeast), 1430m (Fish Lake Valley to the west) and 1440m (Lida Valley to the south). While the elevation difference makes this a possibility, Davis, Friedman and Gleason (1986) concluded that there is no evidence to support this conjecture. Clayton Valley is classified as a medium sized valley with about 100 km² of playa floor which receives drainage from approximately 1,300 km².

History

The history of the Clayton Valley property is closely tied to that of the adjacent lithium brine plant. The exploration target of the current property is, in part, the extension of the actively mined brine field. The mine is currently called the Silver Peak Operations of the Chemetall Foote Corporation, which is a subsidiary of Rockwell Holdings (ROC:NYSE). Although a number of reports have been published that describe the geology and lithium mineral deposits in Clayton Valley, little information is publically available on the lithium exploration history of the area. Davis, Friedman and Gleason (1986) comment on how in spite of numerous wells drilled between 1964 and 1978 by Foote Mineral Company, and in 1912 and 1977 by the US Geological Survey, interpretation of the basin sediments was not easy. Poor recovery, contamination and the highly faulted nature of the valley sediments contributed to the complications. An exploration and drilling program started in 1976 using reverse circulation drilling and careful logging of the cuttings was finally successful in establishing a clear understanding of the valley sediments. There is little doubt that Foote Mineral Company conducted some degree of exploration on the area covered by the current property. The result of this work remains proprietary and has not been disclosed.

Before lithium was targeted in the area there had already been a significant history of silver and gold exploration. The Silver Peak district can be divided into Mineral Ridge and Red Mountain areas which became active in the 1860s and 1907 respectively. Salt was mined from Clayton Valley – referred to at the time as Silver Peak Marsh, for local use and some exploration was conducted for economic quantities of borax and potash. No economic grades and quantities were found. During the 1950s Leprechaun Mining Company discovered high concentrations of lithium in sub surface brines while exploring for high-potassium brines. At least one company (Newmont) optioned the property from Leprechaun during early 1960s, but it was not until Foote Mineral Company acquired the property in 1964 that serious advances toward developing a lithium producer were made. Construction of a lithium plant was begun in 1964 by converting a mill site previously used for silver ore produced by mines in the area. Lithium carbonate production began in 1967 and has continued to the present.

The lithium recovery operation pumps brines from 100 to 250m depth (Barrett and O’Neal, 1970). Brines used for production in 1970 were reported (Garrett, 2004) to contain 300 ppm Li, which was concentrated to approximately 5,000 ppm Li by solar evaporation. By 2001 the concentration of the initial brine had dropped to 160 ppm Li and the final brine was 6,000 ppm Li. Processing of this concentrated brine was completed 4.8 km away at a plant in the town of Silver Peak. Prior to

1964 when Foote Mineral Co took it over, this plant had operated as a silver ore cyanide leach system from 1864 to 1961.

In a 1982 site visit report Foote Mineral Company is described as a subsidiary of Newmont Mining Company. (The date range during which Foote Mineral was a subsidiary of Newmont is not known.) The report also indicated that 49 wells were active although not all were used to produce lithium brine.

In 1988 the company was acquired by Cyprus Minerals Co and became Cyprus Foote Mineral. In 1998 it was taken over by Chemetall, a large German-based international chemicals conglomerate, and the name changed to Chemetall Foote Corporation. Chemetall and all their assets were in turn taken over by Rockwell Holdings in 2004.

Foote Mineral Company, and their subsequent parent companies have been reluctant to disclose production data. In addition, current USGS publications summarizing mineral production do not disclose the quantity of lithium produced in the United States since Clayton Valley is the only producer and this would disclose confidential company data. Prior to this confidentiality criteria being imposed there were a number of published reports and estimates, some of which have been cited in this report. Price, Lechler, Lear and Giles (2000) report that by 1991 a cumulative total of 25,600 tonnes of Li had been produced. This averages to 1,070 tonnes Li per year. Garrett (2004) reports that in 1997 the operation produced 1,072 tonnes of Li (as 5,700 tonnes of Li_2CO_3). This suggests that production rates were held quite constant. Based on this, we estimate that by 2008 a cumulative total of almost 44,000 tonnes Li has been produced. Price et al (2000) also reported that in 1990 the reserve² was estimated to be 65,000 tonnes of Li. Estimation of reserve is complicated by the ability of the incoming groundwaters to dissolve evaporites containing lithium and to a limited extent, recharge the reserve.

Two mineral endowment estimates have been published for Clayton Valley. The first was in Kunasz (1975) which estimated in the order of 700,000 tonnes Li. This estimate has been superseded by a newer one published by Price, Lechler, Lear and Giles (2000) who estimate 2 to 22 million tones of Li were released into the Clayton Valley water system. A mineral endowment estimate is not attempting to identify where the commodity is located, as would be the case in a resource. It is attempting to estimate the total amount of the commodity available to potentially form mineralization. It should be realized that much of the lithium will dissipated in forms and concentrations that are not of economic interest.

² This reserve is not 43-101 / CIM compliant and is provided only for historical description of the Silver Peak Operations Lithium Mine.

In spite of this, mineral endowment estimates are useful information in determining if exploration of an area is warranted. Details of the endowment estimate by Price et al (2000) is discussed under *Exploration*.

Geological Setting

Basin and Range Province has a complex geological history that has resulted in a substantial number of diverse mining districts, some of which include world-class deposits. In western Nevada the north oriented ridges and valleys which reflect extensional, graben structures are disrupted by the Walker Lane right lateral faulting. This results in the ridge and valley orientation turning to the northeast. Walker Lane is believed cross to the east of Clayton Valley, near Goldfield. To the west of Clayton Valley is another dextral structure – the Death Valley – Furnace

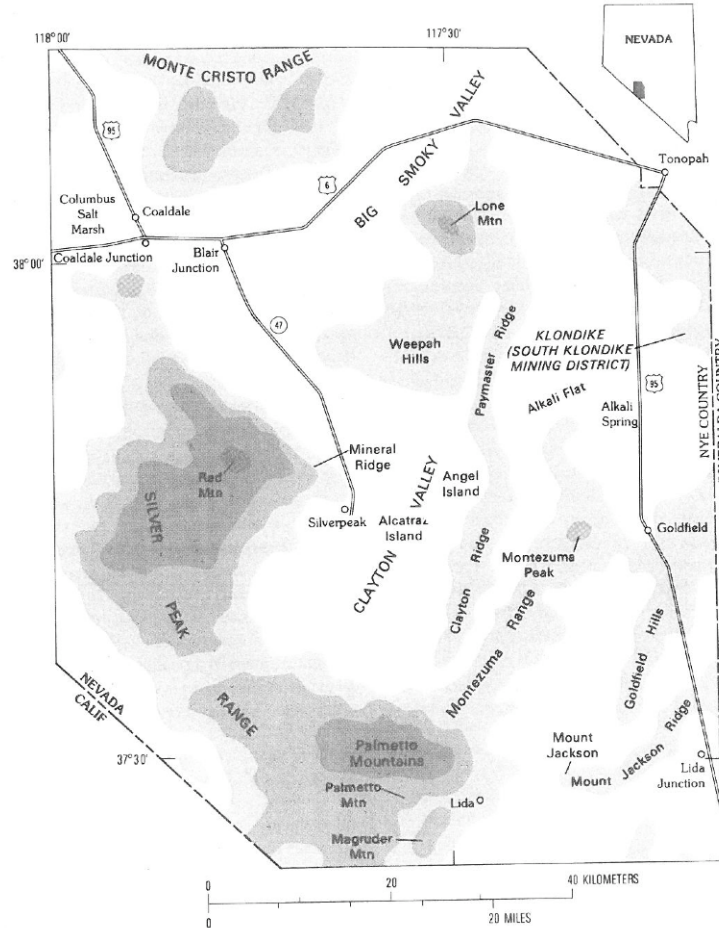


Figure 2 Geographic features of the Clayton Valley Area, from Davis, Friedman and Gleason 1986.

Creek Fault Zone. To the north, the sinistral Warm Springs Lineament

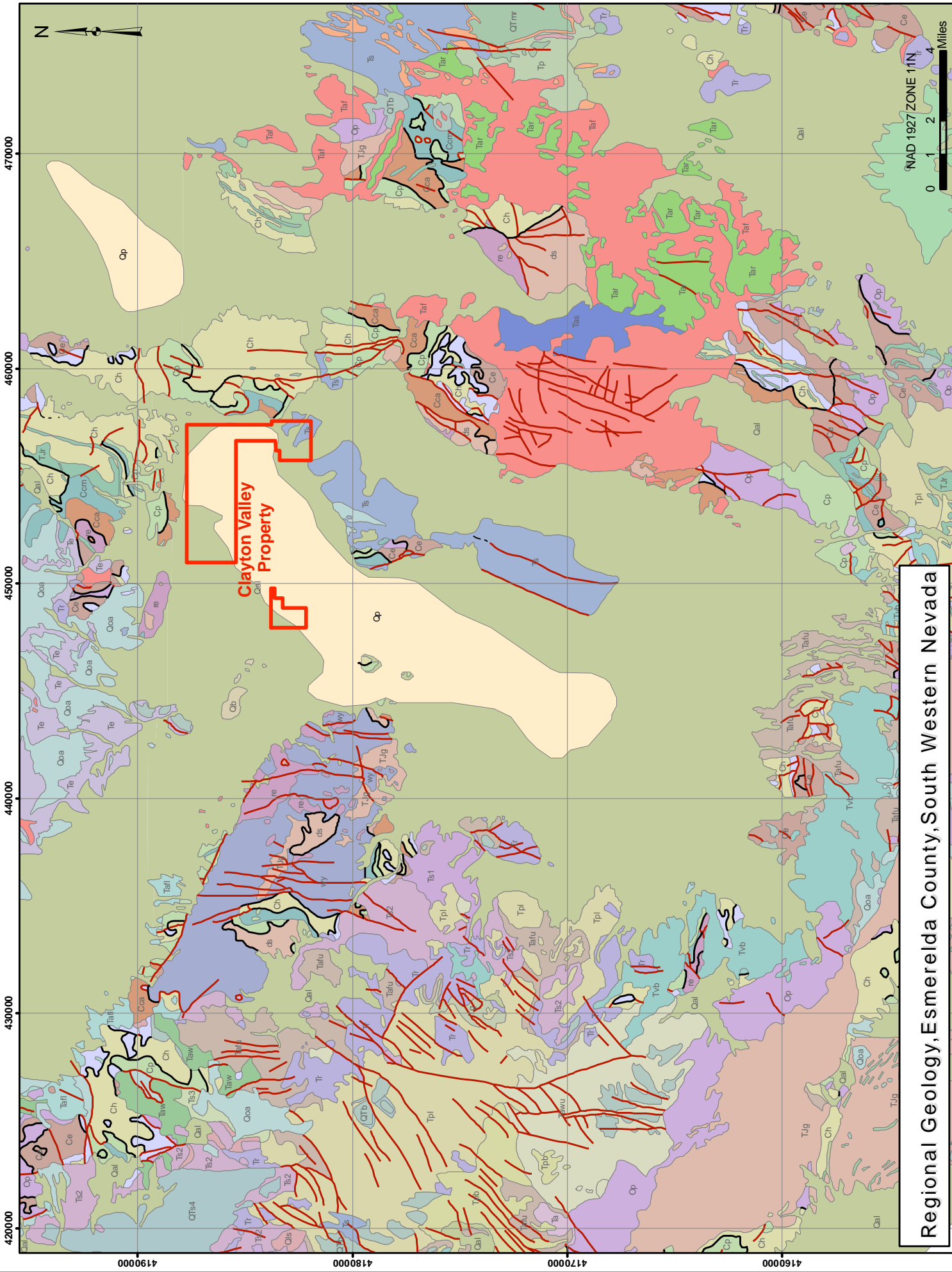
lies on the north side of Big Smokey Playa. Within Clayton Valley there is no evidence of lateral movement on faults. Scarps identified in Quaternary alluvial gravels have two trends within Clayton Valley. Along the eastern margin, moderately dissected scarps strike at 020°. South of the northeastern arm of the playa, more highly dissected scarps in Quaternary alluvium and Tertiary lacustrine sediments strike approximately 065°. The most recent movement on the 020° set probably took place less than 10,000 years ago, while the latest movement on the 065° set was probably closer to 20,000 years ago. (Davis and Vine, 1979).

Pre-Tertiary rocks outcrop in the ridges surrounding Clayton Valley and include Precambrian metamorphic and sedimentary rocks, Paleozoic marine sediments and Mesozoic intrusives. The oldest rocks include the upper Precambrian Wyman Formation, Reed Dolomite and the Deep Spring Formation. The Precambrian and Lower Cambrian Andrews Mountain member of the Campito Formation is also present. Conformably overlying these rocks are approximately 2400m of Cambrian and Ordovician strata of siltstone, black shale, chert, limestone and dolomite that represent deep water facies equivalents of the Paleozoic shelf carbonates of central and eastern Nevada. The units include the Lower Cambrian Montenegro member of the Campito Formation, Poleta Formation, Harkless Formation and Mule Springs Limestone; Middle and Upper Cambrian Emigrant Formation; and Ordovician Palmetto Formation.

Plutonic rocks intrude the Precambrian and Paleozoic strata at Lone Mountain, Weepah Hills, Palmetto Mountains and Mineral Ridge. These rocks are generally grey, coarse to medium grained quartz monzonites with ages ranging from Jurassic to Tertiary. There is no evidence that pre-Tertiary rocks have contributed to the lithium collected in the playa and brine at Clayton Valley.

Resting unconformably on these older rocks are younger, Tertiary and Quaternary sediments and volcanics, which provide the aquifers hosting the lithium bearing brines. Some of the volcanics to the east of Clayton Valley contain significantly higher levels of lithium than normal and it is believed that as they weathered they provided the lithium in ground water that has now moved down to the low point in the drainage system, which is Clayton Valley. Other lithium sources, such as local hot springs and other volcanics may also have contributed to the lithium accumulated in Clayton Valley.

Normal faults, steeply dipping to the west have resulted in bedrock depression into which brines have accumulated. Fault scarps form the east side of the valley and sediments dip gently toward this side as



**Clayton Valley
Property**

Regional Geology, Esmeralda County, South Western Nevada

All claims digitized from GeoExplorer Corp SP Lode Claim Maps, 2008. Geology: USGS, 2009.

Regional Geology Legend, Esmeralda County, South Western Nevada

Clayton Valley Claims

FAULTS

--- Inferred fault

— Known fault

— Concealed thrust fault

— Known thrust fault

LITHOLOGY

<p> Cc - Campito Formation; siltstone, quartzite</p> <p> Cca - Campito Formation; fine-grained quartzite</p> <p> Cca(?) - Campito Formation; fine-grained quartzite</p> <p> Ccm - Campito Formation; green siltstone</p> <p> Ccm? - Campito Formation; green siltstone</p> <p> Ce - Emigrant Formation; claystone, limestone, chert</p> <p> Ch - Harkless Formation; dominantly green siltstone</p> <p> Ch(?) - Harkless(?) Formation</p> <p> Cm - Marble; poss. corr. w/Mule Sp. Limestone</p> <p> Cms - Mule Spring Limestone</p> <p> Cn - Nopah Formation; gray thick-bedded dolomite</p> <p> Cp - Poleta Formation; carb., siltst., limest., qtzite.</p> <p> Cp(?) - Poleta(?) Formation</p> <p> Csh - Siliceous hornfels</p> <p> Jd - Dunlap Formation; sandstone, conglom., red shale</p> <p> Ms - Shaly rocks</p> <p> Op - Palmetto Formation; shale, chert, limest., qtzite.</p> <p> Op(?) - Palmetto Formation; shale, chert, limest., qtzite.</p> <p> Opo - Pogonip Group; thin-bed limestone w/shaly interbed</p> <p> Pd - Diablo Formation; dolomite, grit, conglomerate</p> <p> QTb - Basalt</p> <p> QTg - Weakly consolidated gravel and sand</p> <p> QTmr - Malpais Basalt and Rabbit Spring Formation</p> <p> QTs - Weakly lithified sandstone and conglomerate</p> <p> QTs4 - Weakly lithified conglomerate and tuffaceous rock</p> <p> Qal - Desert wash, colluvium, alluvium, playa deposits</p> <p> Qb - Basalt</p> <p> Qls - Landslide deposits</p> <p> Qm - Glacial moraine</p> <p> Qoa - Older alluvium</p> <p> Qp - Playa lake deposits</p> <p> Qs - Bedded clay and silt</p> <p> TJd - Aphanitic to med.-grain dioritic to andesit. rocks</p> <p> TJg - Coarse-grained granitic rocks</p> <p> TJr - Rhyolite and quartz porphyry dike rocks</p> <p> TRc - Candelaria Formation; shale, sandstone</p> <p> TRe - Excelsior Formation</p>	<p> Ta - Porphyritic andesite</p> <p> Taf - Airfall tuff and tuff breccia of rhyolitic comp., Ash flow deposits</p> <p> Taf(?) - Ash flow deposits</p> <p> Taf1 - Lower nonwelded ash flow</p> <p> Taf2 - Lower nonwelded ash flow</p> <p> Tafu - Rhyolitic airfall tuff</p> <p> Tar - Dark rhyolite or rhyodacite</p> <p> Tas - Tuffaceous shale and intertonguing airfall tuff</p> <p> Taw - Rhyolitic to quartz latitic welded ash flows</p> <p> Tawu - Upper welded ash flow</p> <p> Tc - Chispa Andesite</p> <p> Td - Dacite</p> <p> Te - Esmeralda Formation; shale, sandstone, tuff</p> <p> Tfb - Fraction Breccia</p> <p> Tg - Gilbert Andesite</p> <p> Tk - Kendall Tuff and latite of Ransome (1909a)</p> <p> Tmi - Mira Basalt; flow intertongues with Siebert Tuff</p> <p> Tml - Milltown Andesite</p> <p> To - Oddie (?) Rhyolite</p> <p> Tp - Pozo Formation</p> <p> Tpb - Porphyritic basalt</p> <p> Tpl - Porphyritic latite or trachyandesite</p> <p> Tqb - Rhyolite breccia</p> <p> Tql - Quartz latite and felsite</p> <p> Tr - Rhyolite plugs, domes, and flows</p> <p> Ts - Shale, siltstone, sandstone, limestone, and tuff</p> <p> Ts1 - Sedimentary unit 1</p> <p> Ts2 - Tuffaceous shale and sandstone</p> <p> Ts3 - Tuff, shale, limestone, and conglomerate</p> <p> Ts? - Shale, siltstone, sandstone, limestone, tuff</p> <p> Tsa2 - Welded ash flow</p> <p> Tsc - Conglomerate and sandstone</p> <p> Tsl - Lower sedimentary unit</p> <p> Tss - Sandstorm Formation</p> <p> Tsu - Shale, siltstone, sandstone, limestone, conglom.</p> <p> Ttc - Thirsty Canyon Tuff</p> <p> Ttc(?) - Thirsty Canyon Tuff</p> <p> Ttm - Ammonia Tanks Member of Timber Mountain Tuff</p> <p> Tv - Vindicator Rhyolite</p> <p> Tvb - Volcanic breccia of andesitic or dacitic comp.</p> <p> ds - Deep Spring Formation; limestone, quartzite</p> <p> ds? - Deep Spring Formation; limest., dolomite, qtzite.</p> <p> re - Reed Dolomite</p> <p> wy - Wyman Formation; siltstone w/limestone interbeds</p> <p> Quaternary Playa</p>
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illustrated in the figure above (from Davis, Friedman and Gleason, 1986). Note that the horizontal scale has been considerably compressed and the beds dip much more gently than the diagram initially implies. Brines are encountered at multiple levels, which vary across the basin and are controlled by the position of more porous beds.

Paleozoic rocks in Clayton Valley probably do not form effective aquifers as they do 150 km to the southeast. Upper Cenozoic rocks do form aquifers within alluvial sediments, bedded tuffs and welded tuffs. Three types of ground water have been identified in the basin. 1) Cold, dilute groundwater of the bedrock highlands. Low permeability and porosity of the Paleozoic basement units reduces the opportunity for deep circulation and large reservoirs. 2) Thermal groundwater, which probably obtains its heat from shallow magma chambers. The presence of a Quaternary cinder cone and Pliocene volcanics near the playa provides evidence of heat sources for higher than normal geothermal gradients. 3) Cold, saline brines. These sodium chloride brines are found in the central playa and where focused by gently dipping sediments that abut fault scarps or equivalent blocks.

Brines used for lithium production are sodium chloride brines with salinities of about 20 percent. Elsewhere in the playa more dilute brines with 1 percent salinity have similar proportions of major components. Lithium appears to correlate well with concentrations in these waters, but correlates poorly with temperature suggesting that thermal waters do not play a significant role in the dissolution of lithium from sediments. Thermal water has a similar major ion composition to that of cold ground water with comparable concentrations.

Groundwaters in the vicinity of the playa are supersaturated with respect to calcite, hectorite (a lithium clay), phillipsite (a zeolite), cristobalite and analcime. Some more dilute brines are saturated with respect to sepiolite. No brines are reported to be saturated with respect to gypsum or halite. Consequently, modern brines are capable of dissolving additional halite and any contained lithium.

Deposit Type

The lithium mineralization in Clayton Valley is best described as a combination of a **continental brine** deposit model and a **continental evaporite** deposit model. The former model describes what has been mined in the valley since 1964, but the latter is also important since its formation was critical to the development of the modern brine. Evaporites form when water bearing dissolved minerals is evaporated to the extent that the dissolved minerals become oversaturated and precipitate. For this process to work effectively, the minerals involved must be water soluble and there must be a means to drive the

evaporation. Since this is usually solar energy, evaporites tend to form in hot, arid climates. An additional requirement is that the water containing dissolved minerals is recharged at a sufficiently high rate to support the accumulation of significant amounts of evaporite minerals. Marine evaporites, where seawater is evaporated to precipitate minerals, occur more commonly than continental evaporites which occur in lakes where temperature and lack of rainfall enable evaporation. Since seawater is considerably more saline than most terrestrial water, substantially greater amounts of *fresh* water are required to precipitate the same amount of mineral.

When evaporites contain sufficient quantities of commercially interesting commodities they become economically valuable. Salt (halite), potash and borax are commodities that have been recovered from evaporite deposits.

The term *brine* is used to describe water with a high level of dissolved solids. The lower limit of total dissolved solids for brine varies with different definitions between 50,000 mg/l and 100,000 mg/l. (This is approximately equivalent to 50,000 ppm and 100,000 ppm.) For comparison, seawater is about 35,000 mg/l total dissolved solids. In many brines, a large component of these dissolved solids will be sodium, calcium, potassium and magnesium. Chlorine and carbonate can also make up a significant component. Lithium brines of commercial interest contain hundreds of ppm lithium. Brine may be generated by concentrating dissolved solids in water by evaporation, or it may be generated by dissolving evaporite minerals. Lithium brines are currently the only lithium source that is able to support lithium mining without other significant credits (such as tantalum, niobium, tin, etc.)

Lithium is much less rare than gold or silver, but its chemical characteristics do not provide for ore forming concentration mechanisms into easily recognizable deposits. Consequently, most rocks contain traces of lithium but rarely at more than tenths or hundredths of a percent. Lithium has an ionic radius of 0.68Å which is too small to allow significant substitution for Na or K in rock forming minerals. Its high solubility results in its concentration in residual magmatic fluids (and therefore pegmatites) and in brines during evaporative concentration. The relative bonding force for exchange reactions is generally $Cs^+ > Rb^+ > K^+ > Na^+ > Li^+$. The lithium content of freshwater is a few tens of ppb, or less. Freshwater has a higher Li:Na ratio than seawater resulting in continental evaporites having higher lithium content than marine evaporites. Closed basins and playa deposits in volcanic terrain provide a favourable setting for lithium, bearing brines and sediments. Volcanic rocks tend to have the highest lithium values followed by granites. Lithium is highly mobile once it has been released into solution by weathering although it may be scavenged by clay minerals. Lithium

chloride is even more soluble than sodium or potassium chlorides and may continue on in fluids, which can then become trapped as inclusions in halite.

Mineralization

Lithium exists in Clayton Valley, and on the property described in this report in two modes: in solution within a brine, and in solid minerals. There are probably multiple (solid) mineral phases in which the lithium occurs including hectorite, a clay mineral and trapped within evaporite salts such as halite. In the context of this section, brine is a liquid form of mineralization containing high concentrations of dissolved minerals. At Clayton Valley dissolved lithium has been exploited economically since 1964. Lithium in solid phases is also important at Clayton Valley since it appears to be the source of lithium in brine. It is not known to what extent solution mining methods have been investigated at Clayton Valley to determine if lithium in solid phases may be economically recovered.

Data reported in Vine, Friedman and Gleason (1986) indicates that the deuterium content measured in brine samples is similar to that of spring water from which the modern groundwater recharge of area takes place. They conclude that brines in the area are not a solution in which concentration has taken place by ongoing evaporation over an extended time period. If this was the case, then the deuterium component should not match the recharge water. This process of solar concentration of a solution and the resulting fractional change in deuterium has been studied and well documented at Owens Lake, California where there is a substantial difference between δD in brines and recharge waters. Vine, Friedman and Gleason further conclude that modern brines at Clayton Valley are the result of dissolving salts in the playa sediments, and that these salt beds were probably formed by the desiccation of a small saline lake. Drilling indicates that several episodes of this salt deposition took place between wetter or pluvial periods when less saline muds were deposited.

Additional compelling evidence for the source of modern brine at Clayton Valley comes from a near unity molar Na:Cl ratio for brines regardless of concentration. Inflow waters have molar Na:Cl ratios ranging from 0.6 to 1.4. Davis, Gleason and Freidman (1986) emphasize that *“it is difficult to conceive of any process other than dissolution of halite that always would produce an Na:Cl so near to unity”*.

Exploration

Although no exploration fieldwork has been conducted by Rodinia on the property to date, published work provides the foundation for a well

developed exploration model. Since the lithium source, transportation mechanisms and trap are all near surface processes, the exploration model for Clayton Valley is exceptional and all three components can be tested and examined at a level rarely possible in other deposit models! Exploration methods should be addressed to answering specific questions that will identify areas of higher prospectively.

Exploration Targeting

The transition from deposit model to exploration model is a critical stage in the exploration process. If it is done well then work on the property can be optimized to answering questions that will potentially have the greatest affect in advancing the project. If it is not done well, then there is a danger that geological information will be collected that will add to the knowledge base of the property, but not aid in fundamental business decisions about the property.

For a mineral deposit to form three conditions must be met. There must be 1) a source of the commodity, 2) a conduit and transportation mechanism to bring the commodity to a focal point, and 3) a physical and chemical trap to drop the commodity in a focused manner. Following this there is also a requirement for the preservation of the deposit from erosion and any other processes that could dissipate the commodity.

Developing an exploration model takes the mineral deposit model, which describes in general terms how a type of deposit forms and is structured, and using local geological information attempts to identify the three conditions required for a deposit to form locally. High prospectivity results from the conjunction of these conditions. Identifying which aspects of the exploration model need better support should influence exploration method choices. The lithium models used at Clayton Valley involve near surface processes. This significantly sets them apart from most mineral deposit and exploration models. Testing aspects of source, conduit and trap should be possible at Clayton Valley since all three should still exist and be relatively accessible. In addition to its exploration potential, this makes Clayton Valley an ideal site for academic study of exploration targeting. In the case of the lithium exploration model it becomes clear that all three of these conditions need to be met, and have been in Clayton Valley.

Source

Pre-tertiary rocks in the area do not appear to be a significant source of lithium. Tertiary rocks do include several lithium sources, and Quaternary clays may provide some lithium sinks.

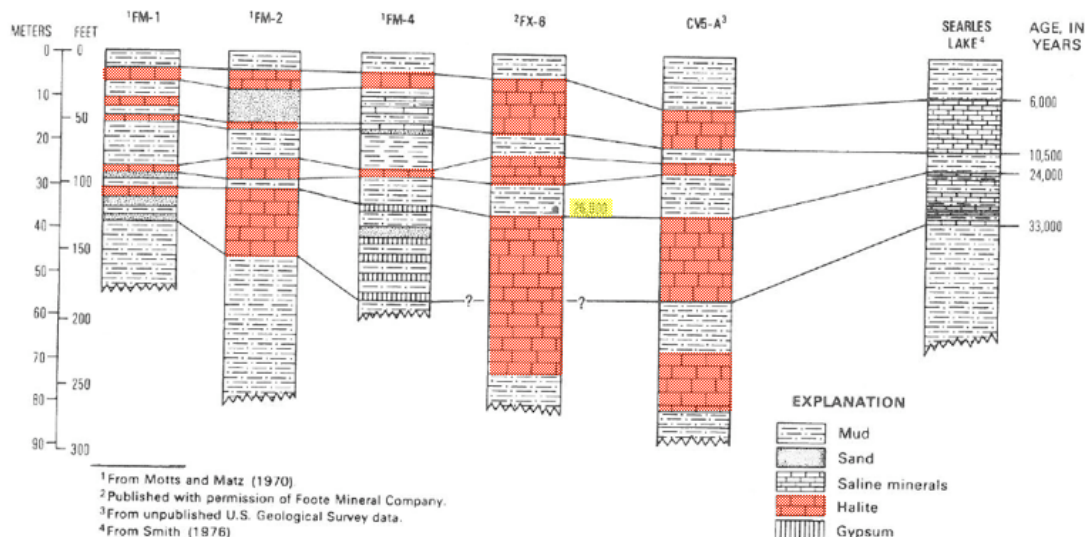


Figure 3. Clayton Valley stratigraphy from Davis, Friedman and Gleason (1986).

In the previous figure, halite units have been highlighted in red. And the position of a 26,900 B.P. radiometric date from Clayton Valley sediments is highlighted yellow.

Several sources of lithium have been considered by workers at Clayton Valley. A hydrothermal source related to the shallow magma sources evidenced in Clayton Valley has been proposed by Kunasz (1970). Lithium is brought in either with late stage magmatic fluids or by hydrothermal leaching of nearby volcanics. Inflow of lithium brines or saline waters from adjacent valleys has been suggested. This multistage collection of lithium from across multiple valleys would significantly increase the catchment from which lithium is accumulated. Subsequent work has proposed lithium released by weathering of volcanics as the source and that the two previous models are less likely or have little direct evidence. Most recently, the case for weathering of volcanics has been developed by Price, Lechler, Lear and Giles (2000) who use the model to estimate the potential lithium endowment of Clayton Valley. Obsidian in the Montezuma Peak area has been found to contain 125 to 228 ppm Li – making it one of the most lithium rich obsidians in the world. Rhyolites and perlites in the area have also demonstrated high lithium values. (In Albers and Stewart (1972) these high lithium sources are near the base of units *Tar*, *Taf* and *Tas*.) Samples of rock altered by groundwater (or possibly high temperature devitrification) have considerably less Li indicating that a significant proportion of the lithium was liberated to surface or groundwater. Price et al (2000) estimates that *Taf* and *Tas* rocks have contributed 22 million tonnes of lithium to the Clayton Valley water system. In addition, the contribution by *Tar* rocks is estimated to be 0.6 million tonnes. If these calculations have been optimistic in the lithium leaching efficiency then cutting the amount

of lithium released to 10% still indicates that over 2 million tonnes of lithium have been liberated. Other units, such as *Tafu* were not considered in this calculation and may also contribute to the available lithium sources.

Conduit

Once lithium has been liberated into the water system it remains highly mobile. Movement of lithium with surface and groundwater will follow basic hydrological principles. Further compilation or analysis of hydrology data for the Clayton Valley catchment will be useful in determining the route travelled by the lithium and therefore where traps may be effective.

Within the valley some of the Quaternary sediments act as aquifers. Drilling has found that tuff layers tend to be better aquifers than mud layers. Identification of tuff layers will assist in identifying conduits in the immediate vicinity of potential traps.

Trap(s)

Nothing more complex than a topographic low, or closed basin is required to trap lithium bearing water. For topographic lows with larger catchment areas there is greater opportunity to accumulate lithium from wider sources. The water trapped in this low must for some time be able to evaporate at a sufficient rate to concentrate to a brine. Dry periods of geological time this may be represented as evaporite beds in the stratigraphic column. This can be seen at Clayton Valley as halite beds with intermediate muds that represent wetter or pluvial periods when evaporation would not have been sufficient to generate evaporite deposits. This is the first stage of trapping lithium at Clayton Valley and it is important to recognize as a exploration target other than brine.

In recent time, surface and groundwater from meteoric sources has entered Clayton Valley and in its passage through evaporite beds has dissolved water soluble minerals to form a brine. Gently, easterly dipping aquifers in Clayton Valley conduct this brine downward until they reach impermeable rocks at a fault scarp that follows the eastern edge of the valley. This is the second stage of trapping lithium in Clayton Valley and is the trap holding brines, which have been commercially exploited. Recognition of this structural type trap is an important part of assessing prospectivity in Clayton Valley.

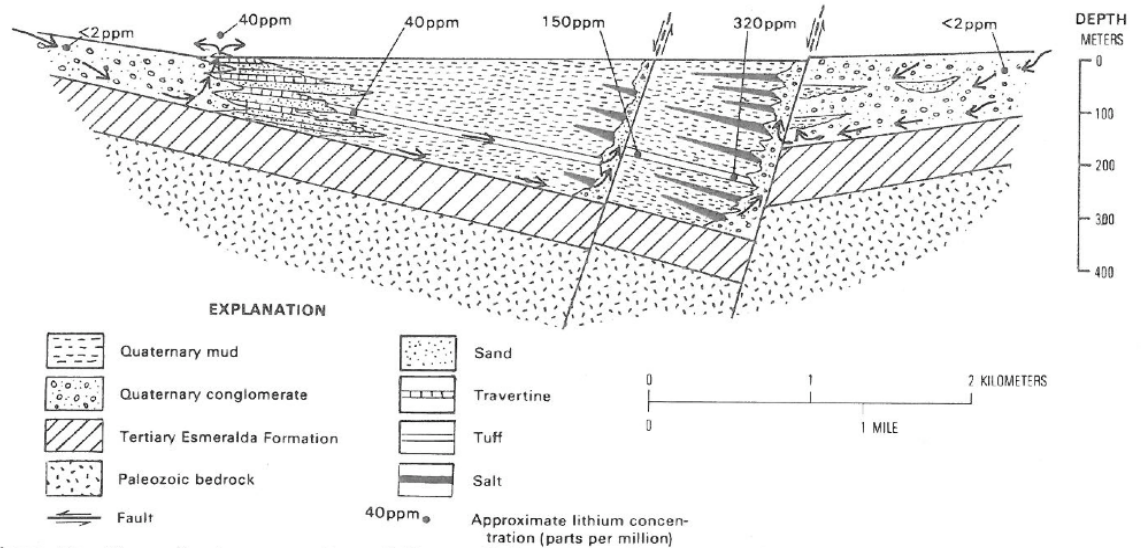


Figure 4 Generalized cross section of Clayton Valley. (from Davis, Friedman and Gleason, 1986 after Albers and Stewart 1972).

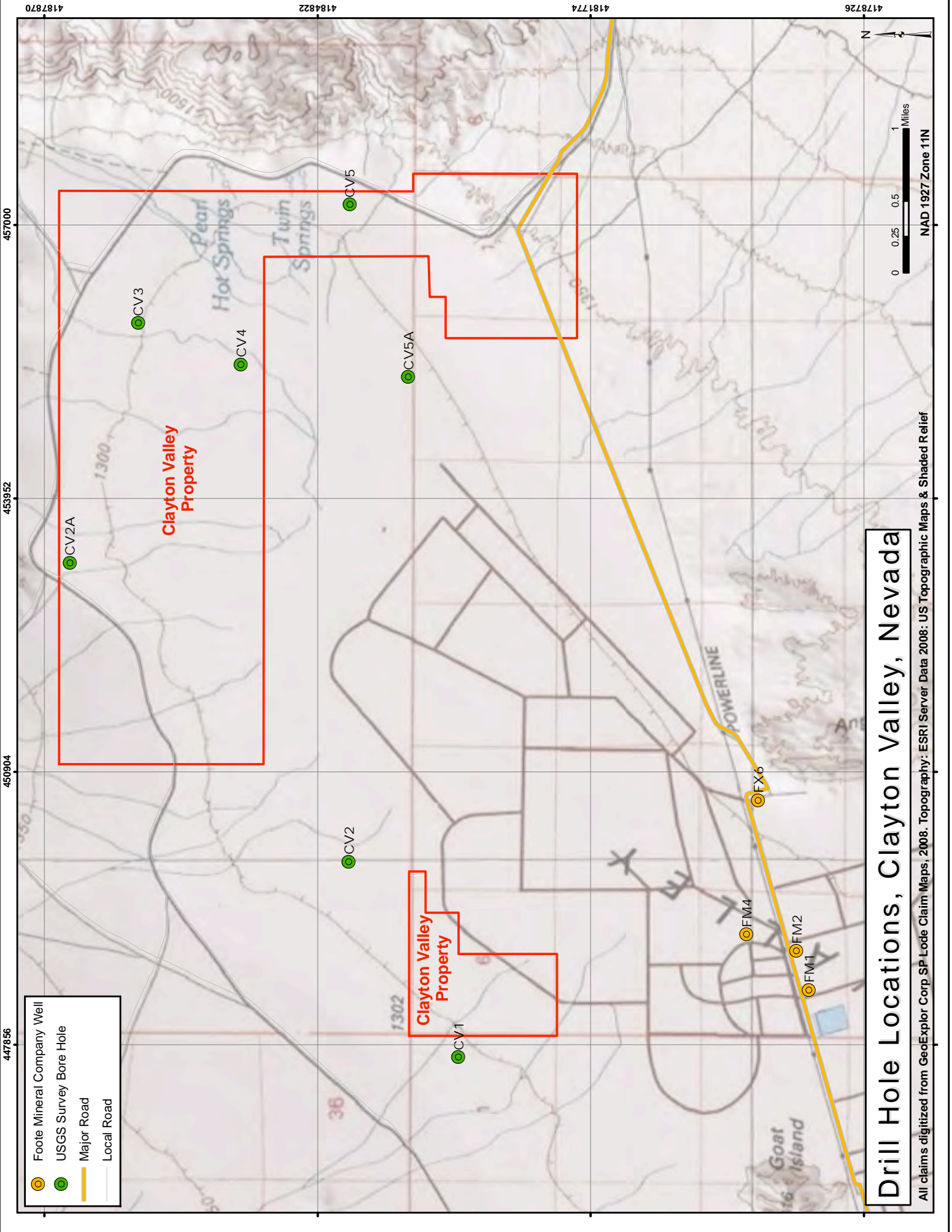
Blind mineralization

It should be noticed that lithium brine mineralization at Clayton Valley is blind even though it formed through near surface processes. In fact, any lithium brine located on surface may be recently concentrated brine (the first type of trap) and not derived from dissolved evaporites as the commercially exploited brine seems to be. Deep looking methods need to be considered for exploration in Clayton Valley. Much of the research in deep looking geochemistry has been conducted over significantly different targets and it is unlikely that migration mechanisms such as electrochemical cells will be active in playas. None the less, identification of deep looking methods for lithium and its proxies at Clayton Valley could provide important technological leverage in an exploration programme.

Drilling

No new drilling has been completed on Rodinia’s Clayton Valley property. Drilling reported here is for historical description and additional drilling will be required to confirm the data. Since the data is from a reliable source, it should be used to influence exploration decisions until superseded by newer data.

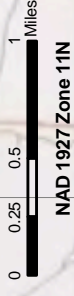
The only public record of drilling on the property is of that done by the US Geological Survey in October and November 1977 (Pantea and Asher-Bolinder, 1982). The drill holes were located along the northeastern edge of the playa, with the exception of holes CV-4 and CV-5a which fall



- Foote Mineral Company Well
- USGS Survey Bore Hole
- Major Road
- Local Road

Drill Hole Locations, Clayton Valley, Nevada

All claims digitized from GeoExplorer Corp SP Lode Claim Maps, 2008. Topography: ESRI Server Data 2008: US Topographic Maps & Shaded Relief



447856 450904 453952 457000 418726 418774 418822 418870

within the playa proper. The purpose of the drilling was to collect data from a known lithium rich area. This could then be compared with data from other drilling that was testing potentially lithium rich playas. Sites were chosen with input from Foote Mineral Company and the results kept confidential until publication in 1982. The location of the drill sites is poorly located in USGS publications with the coordinates only accurate to the nearest minute latitude and longitude (approximately 1.9 km). A map in Davis and Vine (1979) may be a better representation of the drill sites. In addition, GeoXplor staff report locating old drill sites in the field that may correspond to the USGS drilling. Regardless of their precise location, the seven holes drilled by the US Geological Survey may be described as on or adjacent to Rodinia’s Clayton Valley property. Those which are adjacent, still provide some data relevant to exploration on Rodinia property.

The table below presents the average, minimum and maximum values for lithium values in sediment and water samples taken from the seven drill holes. Note that brine with 160 ppm lithium has been reported to be

Hole ID	Depth (m)	Li in Seds (ppm)			Li in Brine (ppm)		
		Avg	Min	Max	Avg	Min	Max
CV-1	120.4	100.7	33	310	37.7	32	60
CV-2	120.4	209.4	34	930	28.0	55	39
CV-2a	83.8	248.5	130	390	67.3	44	100
CV-3	187.4	168.4	16	780	52.9	41	91
CV-4	242.3	455.7	39	1840	109.2	44	190
CV-5	146.0	295.2	62	770	69.3	24	110
CV-5a	225.6	397.5	160	960	292.6	100	390

used for evaporation pond feed.

Hole locations on the map are approximate, but when evaluated with the previous table of results should give an indication of how lithium levels vary across the edge of the playa.

Sampling Method and Approach

Sampling conducted by the USGS does not describe their analytical methods for either field or lab methods. Since the organization performing the laboratory work is highly professional and well regarded, there is no reason to have concern about the published results. It is unfortunate that it is not possible to comment on possible limitations of the methods used. In particular, it would be useful to know if the

digestion used in the analytical procedures was strong enough to extract lithium in all sites. Weakly bound lithium would more likely be available to groundwater leaching. Future work should use select digestions that will provide data about leachable lithium in addition to total lithium.

Data Verification

None was possible.

Adjacent Properties

Silver Peak Lithium Deposit is the only adjacent property relevant to this report. It has been described in other sections.

Mineral Processing and Metallurgical Testing

None.

Mineral Resource and Mineral Reserve Estimates

None.

Other Relevant Data and Information

None.

Interpretation and Conclusions

Estimates of the lithium endowment of Clayton Valley suggest that 2 to 22 million tonnes of lithium were liberated into the water system of Clayton Valley. Only a fraction of this is currently accounted for in the total production and resources at the Silver Peak Lithium Operations mine. Further exploration is warranted to identify additional lithium concentrations.

Recommendations

Further exploration of Clayton Valley is recommended to determine 1) if there are extensions to the actively mined brine field on Rodinia property; 2) if there are additional trapped brines and 3) if lithium trapped in solid phases can be extracted.

Hydrologic study: further compilation and analysis of Clayton Valley hydrology is warranted. This can be completed at lower cost than drilling and should be conducted early in a phased programme to

determine areas of interest for follow-up geochemical and geophysical surveys. The study should identify and determine flow patterns of the catchment area for the valley. Part of this study would be analysis of DEM data, which may be of assistance in identifying potential sites of normal faulting needed for second stage traps.

Geochemistry and Geophysics: biogeochemistry has been used to detect lithium at depth. Other options for deep looking geochemistry for lithium or proxies should be investigated since geochemical and geophysical methods, particularly when used together, can be critical for subsequent drill targeting. The relatively low cost of geochemical surveys should allow it to be used in conjunction with other preliminary work. An orientation survey should be conducted before final decision on survey design and methods are made. This orientation survey should also evaluate what vegetation in Clayton Valley might be sufficiently deep rooted to be amenable to biogeochemical methods. Seismic surveys with either 3D or 2D methods have been used in the past to help understand the stratigraphy of Clayton Valley. Identification of the sediment-bedrock contact, and identifying when this is a high angle fault scarp would be valuable in identifying potential trap locations. It is unlikely that geophysical methods alone will be able to directly locate evaporites or brine. Other geophysical methods used in sand and gravel exploration may also be appropriate for Clayton Valley. If possible, an orientation survey should be included in the survey. Some of the geophysical budget should be held back to follow-up any targets generated by the geochemical survey.

Drilling options: drilling is ultimately required to test for lithium brine or mineralized sediments. Due to the cost of drilling it is recommended that this stage occur after hydrology, geophysics and geochemistry have been used to optimize target selection. A few holes to confirm previous work and collect samples from depth for geochemical analysis could be used in the early stages as orientation for the main drilling phase. Reverse circulation drilling has traditionally been employed for these targets.

Solution mining evaluation: part of the goal of drilling will be to collect sufficient sample to evaluate solution mining potential of lithium trapped in solid phases. An expert in this subject should be consulted before the drilling programme is begun to ensure that sampling can be done that will enable the evaluation of solution mining methods. Successful evaluation of this will be very important in determining what parts of the lithium endowment in Clayton Valley can be extracted with current technology.

Preliminary Budget

Exploration of Clayton Valley should take place in phases with the first phase consisting of hydrologic assessment and geochemical orientation followed by a seismic survey. If a reverse circulation drill was available for a short job then confirmation of USGS work could be done and subsurface samples collected to complete geochemical orientation.

Hydrologic study:	\$15,000
Geochemical orientation:	\$10,000
Geochemical survey:	\$40,000
Geophysics (seismic):	\$100,000
Drilling (400m)	\$50,000
total	\$215,000

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Date and Signature Page

This report titled “Technical Report on the Clayton Valley Lithium Property, Esmeralda County, Nevada”, dated 12 March 2009, was prepared by and signed by the following author:

“signed”

Dated at Vancouver, BC
12 March, 2009

John C Harrop, P.Geol.
Senior Geologist
Coast Mountain Geological Ltd

Certificate of Qualifications

I, John C. Harrop, P.Geo., do hereby certify that:

As an author of this **Technical Report on the Clayton Valley Lithium Property**, dated 12 March 2009, I hereby make the following statements:

1. I am currently employed as a Senior Geologist by: Coast Mountain Geological Ltd., Suite 620 – 650 West Georgia Street, Vancouver, British Columbia, Canada, V6B 4N9
2. I graduated with a Bachelor of Science degree in Geological Sciences from the University of British Columbia in 1983.
3. I am a member of the Professional Association of Professional Engineers and Geoscientists of British Columbia (Reg. No. 19122).
4. I have worked as a geologist since my graduation from university in 1983.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43 -101.
6. I am responsible for the preparation of this technical report titled Technical Report on the Clayton Valley Lithium Property, and dated 12 March 2009.
7. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
8. I am independent of the issuer based on the tests in section 1.5 of National Instrument 43-101.
9. I have read National Instrument 43-101 and Form 43-101FI, and the Technical Report has been prepared in compliance with that instrument and form.

10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report on the Clayton Valley Lithium Project,

Signed and dated this 12th day of March, 2009 at Vancouver, British Columbia.

"signed and sealed"

John C. Harrop, P.Geo.