Occidental of Elk Hills, Inc.

Oxy CO_2 Project

Injection Permit Request

October 14, 2009

Introduction

The Occidental of Elk Hills (OEHI) CO_2 enhanced oil recovery (EOR) and sequestration project (OXY CO_2 Project) intends to implement CO_2 EOR to increase oil and gas production and reserves from the Stevens reservoirs within the Elk Hills Unit. The OXY CO_2 Project will utilize CO_2 from the Hydrogen Energy California (HECA) project, which will be located near the unit. The HECA project will generate CO_2 from an Integrated Gasification Combined Cycle (IGCC) power plant. During normal operations, the HECA project is expected to deliver an annual average rate of 110 million standard cubic feet per day (MMSCF/d) of CO_2 (approximately 2.2 million tons per year) to Elk Hills, where it will be utilized in a miscible EOR recovery process.

The Stevens reservoirs are considered the best CO_2 EOR targets within Elk Hills Field. These reservoirs have been developed on 10 - 20 acre spacing and have produced over 500 million barrels of oil to date. Reservoir pressure in the Main Body B (MBB) sand (one of many sub-layers within the Stevens reservoir) is near the minimum miscibility pressure, indicating the MBB sandstone is an ideal initial candidate for miscible-CO_2 EOR. The MBB sand represents only a subset of target Stevens sand intervals suitable for CO_2 EOR. Some identified target intervals have undergone pressure depletion and will require re-pressurization to realize maximum oil recovery benefit from CO_2 injection.

The OXY CO_2 Project is anticipated to be a long-term project, continuing twenty years or more. With updated development plans and continued success, it is anticipated that the requested permit area will be expanded over time to accommodate twenty years of CO_2 delivery. The rate and location of project expansion will be dictated by development plans, reservoir performance, and project economics. This application will be supplemented by a complete CO_2 EOR and sequestration project description in approximately March 2010 ("OXY CO_2 Project Description Supplement"). As such, to accommodate the future expansion phases, the proposed Underground Injection Control (UIC) Class II project permit will be expanded over the life span of the project.

CO_2 injection in the targeted zones of the Stevens reservoirs has the potential to significantly increase oil reserves and extend the productive life of the Elk Hills Field. There is adequate capacity within the Stevens reservoirs to store the volume of CO_2 generated by the HECA Project. The operational injection volume and pressure will be reviewed as a part of OEHI's review process with California Division of Oil, Gas and Geothermal Resources (DOGGR). During all phase of this project OEHI will comply with existing and future UIC Class II regulations enforced by DOGGR.

In preparation for this project, OEHI has analyzed issues related to both EOR and long-term storage of CO_2. This additional study specifically examined the following topics:

- Reservoir (Site) Characterization
- Well and Facility Operations
- Monitoring, Measurement, and Verification (MMV)
- Closure

The above items, including an analysis of long-term storage capacity for the project, are further detailed in Appendix A.

A. Engineering Study

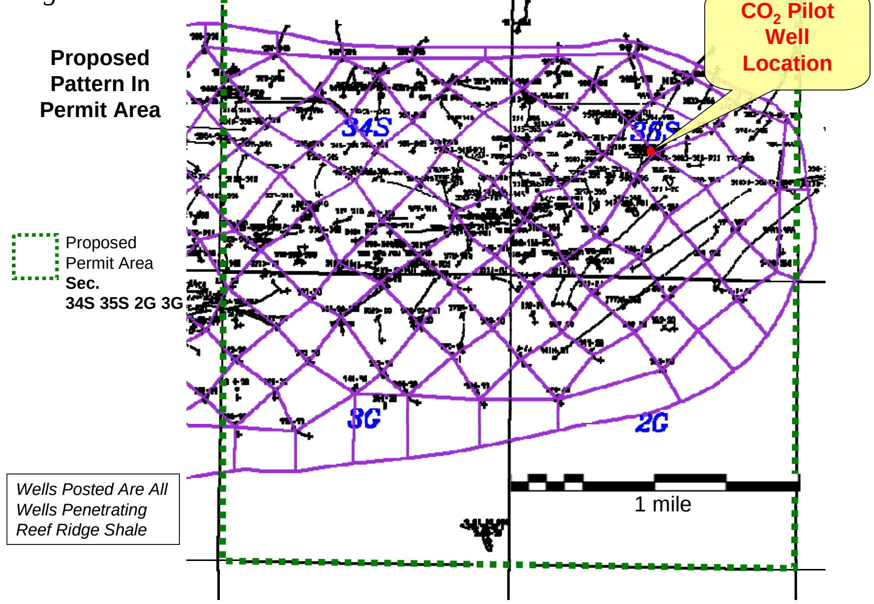
Technical data presented in this application are intended to represent, but are not limited to, the initial four-section project area. To accommodate the anticipated phases of this project, the proposed permit area will be expanded with the submission of additional UIC Class II expansion permit applications. Each subsequent application will focus on data specific to the subject expansion area.

A.1.1. Objectives:

The main objective of the OXY CO_2 Project is to economically maximize oil recovery within the requested permit area and to safely store CO_2 over the long term (sequester) in accordance with all county, state, and federal safety and environmental rules and regulations.

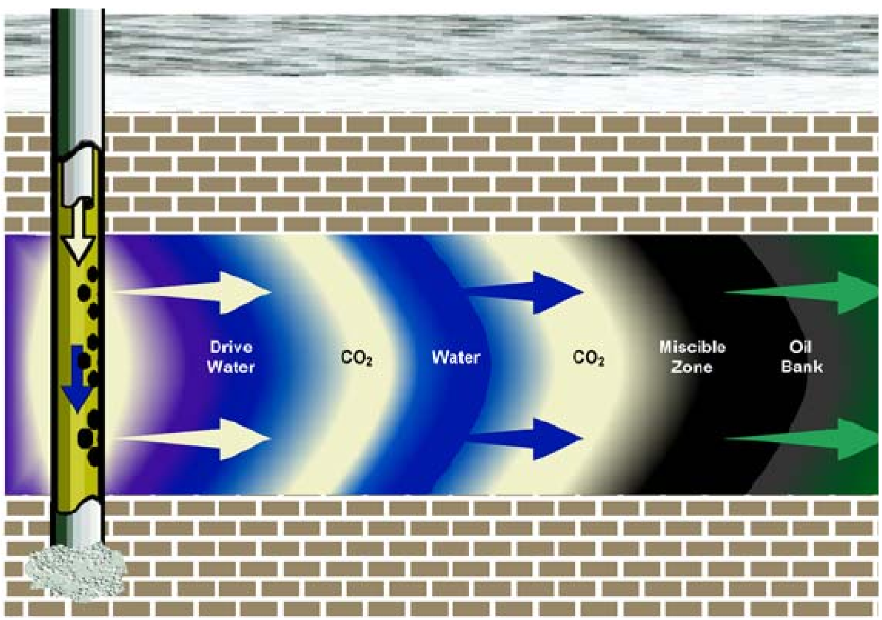
The OXY CO_2 Project follows a successful pilot project conducted in 2005 within the requested permit area. The 2005 Elk Hills CO_2 Pilot was originally designed as an observation pilot with injection taking place in well 355A-35S which was drilled ~135' away from well 355-35S. Well 355-35S served as a fluid sampling well during the pilot. Observation wells 355B-35S and 355C-35S were positioned ~110' away from well 355A-35S and completed with fiberglass casing across the Upper MBB (UMBB) to provide electric logging capabilities throughout the pilot project. During operation, offset wells were allowed to produce and clearly demonstrated recovery of oil that would not have been produced without such an EOR process. The four sections of the proposed EOR permit area encompass the previous pilot study area as illustrated in Figure 1. This submitted permit is intended to expand the area of CO_2 EOR permit 22800021 (Appendix B) approved in 2004. OEHI also currently operates a Stevens waterflood project that encompasses the proposed project area in accordance with DOGGR permit 22800006 additionally referenced in appendix B.

Figure 1



During planned EOR operations, CO_2 will be injected into the Stevens reservoirs at a pressure high enough to facilitate transfer of the CO_2 into the reservoir where it can contact the oil, but well below pressures that could cause injected CO_2 or formation fluids to escape the confining geologic zone. Due to the induced pressure gradient, the CO_2 will flow away from the injection well (see Figure 2). As it does, a portion of the CO_2 will contact and become miscible with the reservoir oil to form a new single-phase solution (i.e., the CO_2 and oil are miscible). The portion of CO_2 that combines with the oil is dependent upon characteristics of both the hydrocarbon reservoir (i.e. pressure and temperature) and the chemical composition of the reservoir fluids. The resulting miscible fluid has the favorable properties of lower viscosity, enhanced mobility, and lower interfacial tension as compared to the reservoir oil alone. In effect, this process mobilizes and recovers oil that would otherwise be trapped within the rock. Water injection may be used to control gas production and sweep the miscible CO_2-oil mixture to production wells.

Figure 2

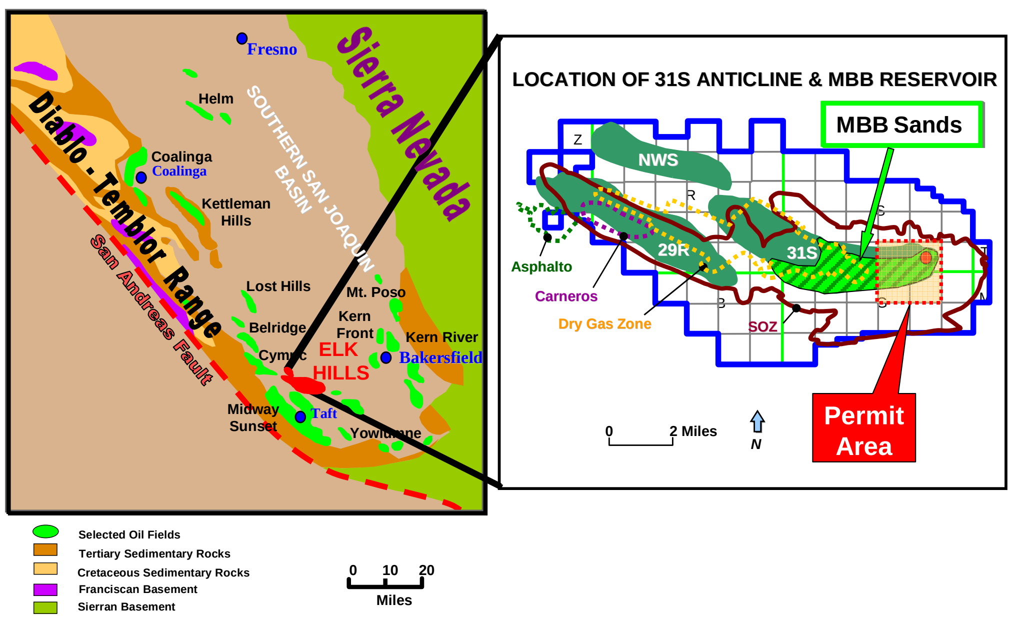


As part of the continuous EOR process, the CO_2 is separated from the produced hydrocarbons on the surface and recycled back to the reservoir within an enclosed system and not released to the atmosphere. The injected CO_2 is monitored closely through each stage of the process. The closed-loop system consists of surface and subsurface facilities for injection, production, processing, separation, compression and reinjection of CO_2 to improve oil recovery. During and following this process, the injected CO_2 becomes sequestered in the Stevens reservoir intervals. This process is referred to as “CO_2 EOR and sequestration.”

A.1.2 CO_2 Program Location:

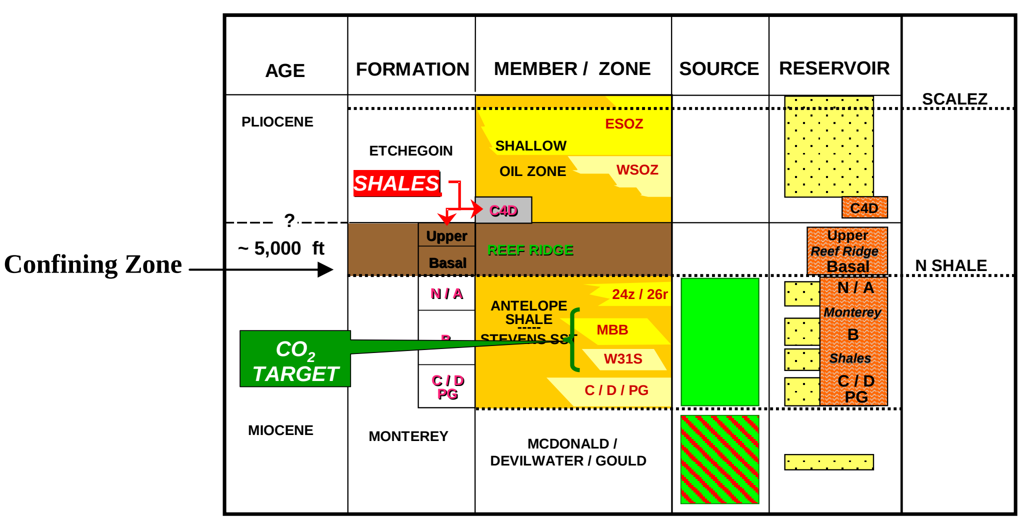
The initial location of the OXY CO_2 Project will be located in Section 34 and 35 of Township 30S Range 24E and Sections 2 and 3 of Township 31S Range 24E. All four sections are located within Elk Hills Unit boundaries as shown in Figure 3.

Figure 3. ***Elk Hills Location Maps***



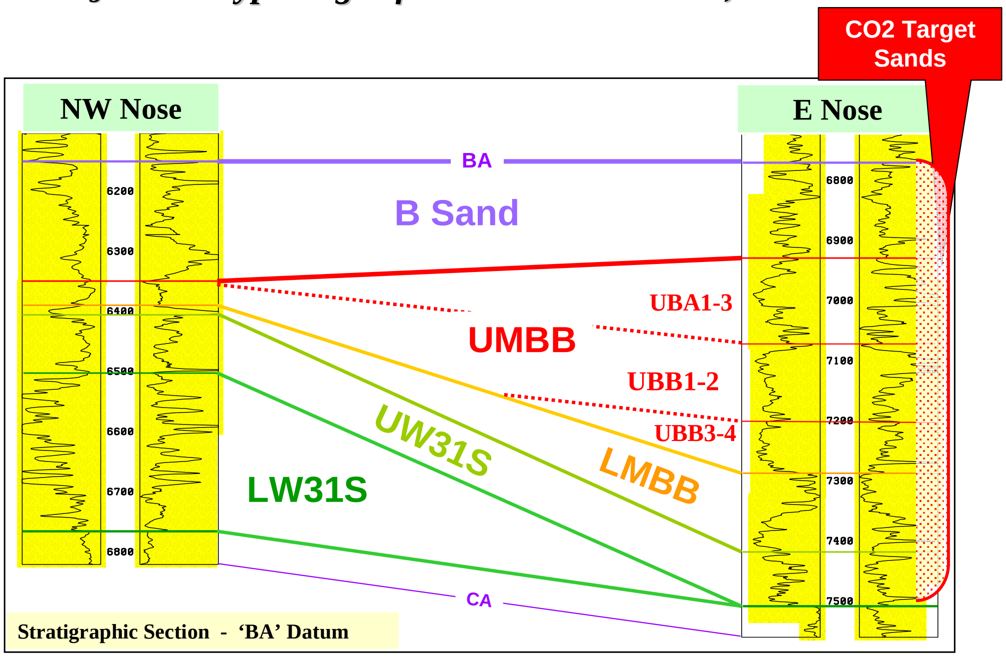
The OXY CO_2 Project will be conducted in the Stevens reservoir interval as shown in the stratigraphic section in Figure 4.

Figure 4. ***Elk Hills Stratigraphic Section***



The OXY CO_2 Project will be initiated in the B-Sand, MBB, and W31S sub intervals of the Stevens 31S reservoir as displayed in Figure 5.

Figure 5. ***Type Logs of 31S Sand Reservoirs, B Interval***



A.2. Average Reservoir Properties

The average reservoir properties of the above shown Stevens intervals are shown below:

Table 1

	Avg Gross Interval (Ft)	Avg. Porosity (%)	Avg. Perm (Ka md)	Original Avg. Temp (F)	Original Avg. Press (PSIG)	Current Avg. Temp (F)	Current Avg. Press (PSIG)
B-Sand	175	18	13	215	3200	215	2600
UBA1-3	140	16	46	215	3210	215	3200
UBB1	75	18	85	215	3210	215	3600
UBB2	46	17	50	215	3230	215	3600
UBB3	100	16	38	215	3240	215	3800
UBB4	38	16	41	215	3250	215	3900
LMBB	115	15	30	215	3280	215	3800
W31S	500	13	27	215	3400	215	3700

A.3. Reservoir Fluid Properties:

The average fluid properties contained in the above shown reservoir intervals are displayed in the following table:

Table 2

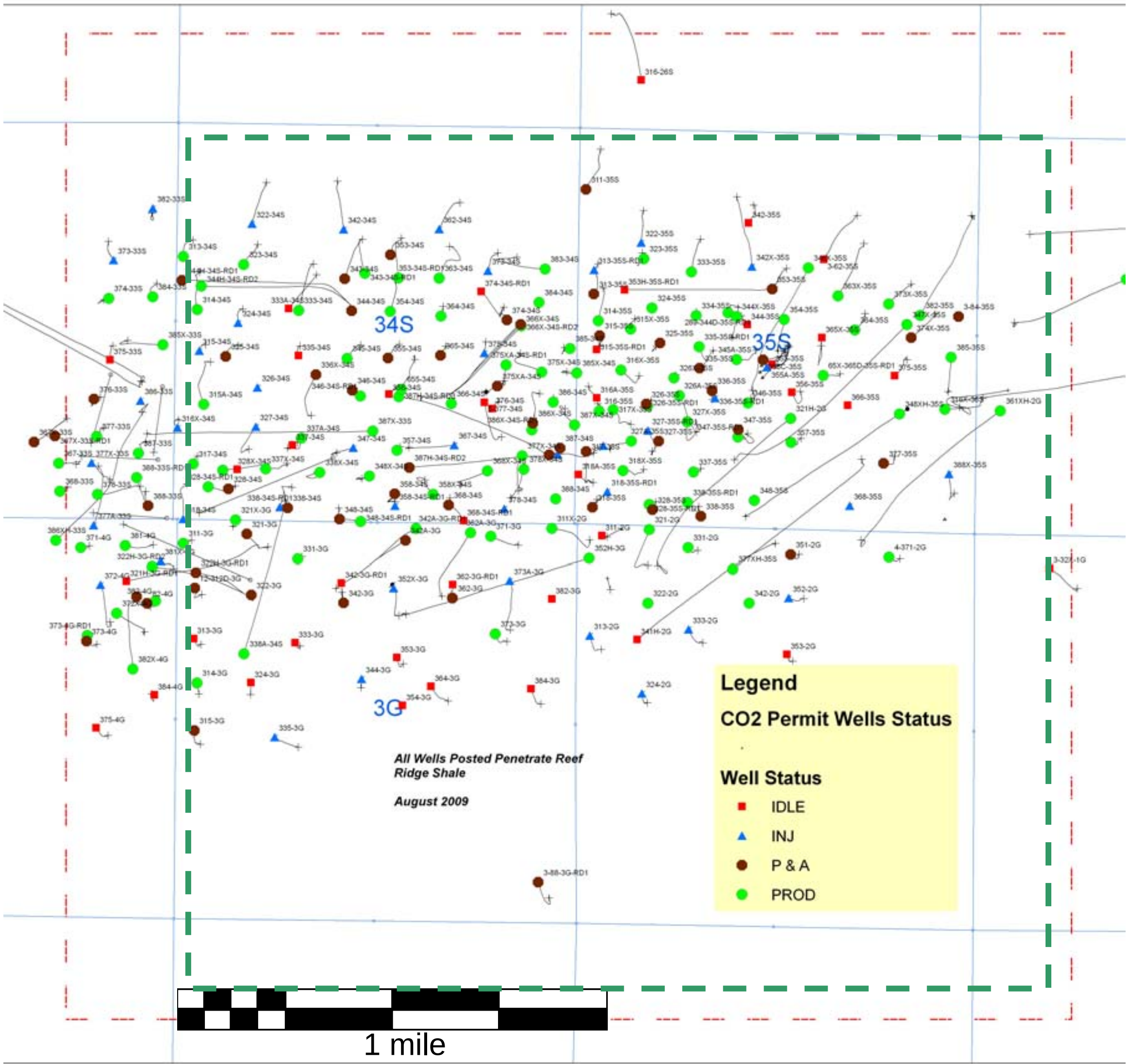
Oil Gravity (API)	Viscosity (cp)	Original Water Salinity (ppm TDS)	Current Water Salinity (ppm TDS)	Gas Gravity
36	0.4	30,000	23,000	0.82

Note: The original Stevens water salinity has been reduced by the injection of Tulare water (5,700 ppm Total Dissolved Solids) for waterflooding purposes.

A.4 Drilling and Abandonment

Figure 6 *(and Appendix C)* illustrates and outlines the proposed permit area and the status of all wells that penetrate the confining Reef Ridge shale interval.

Figure 6



All producing wells and injection wells are monitored for pressure, produced fluid rates, and produced fluid composition.

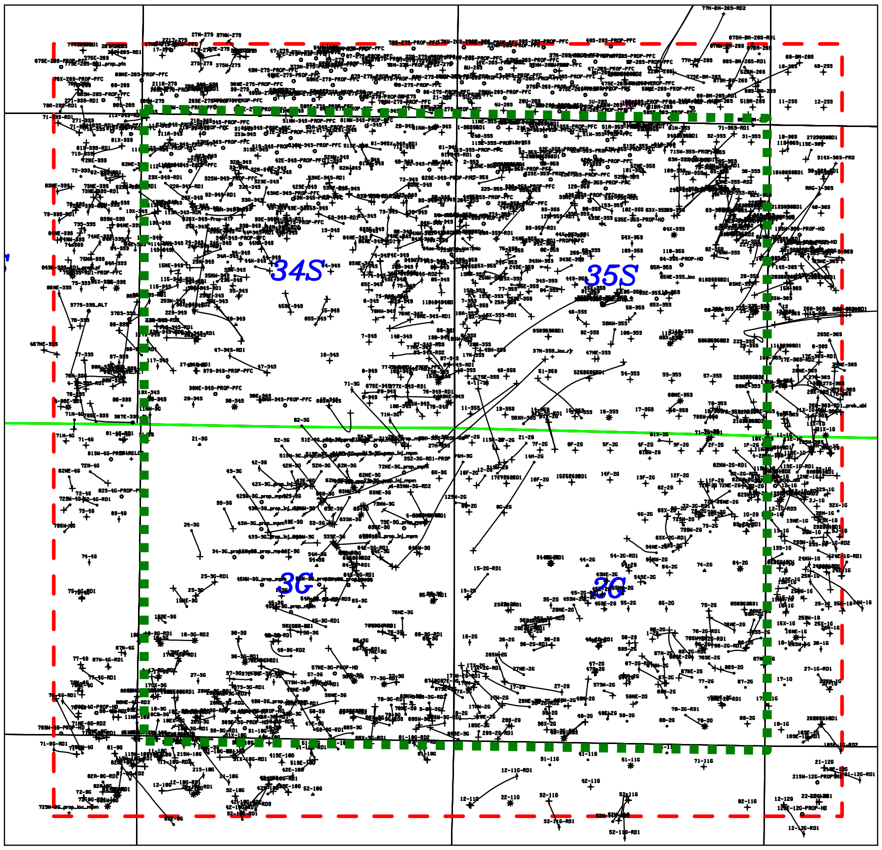
A.5 Casing Diagrams:

Casing Diagrams for all producing, idle, and abandoned wells that penetrate the proposed injection zone are provided within Appendix D. These diagrams address items 5.a through 5.h as requested in the California Code Regulations 1724.7.

A.6 List of All Wells Not Penetrating the Injection Zone

Figure 7 is an illustration of wells within a ¼ mile radius of the proposed permit area that do not penetrate the Reef Ridge Shale. Appendix E includes a list of these wells with TD (TVDss) and well status.

Figure 7



B. Geologic Study

B.1 Structural Contour Map

Figure 8 displays a TVDss structural contour map on the top of the Reef Ridge Shale, which is the Stevens cap rock (confining zone). Figure 9 displays a TVDss structural contour map of the B-Sand. Both maps display all wells which penetrate the Reef Ridge Shale. For each unit and sub-unit within the injection zone, a structural contour map is located in Appendix F.

Figure 8

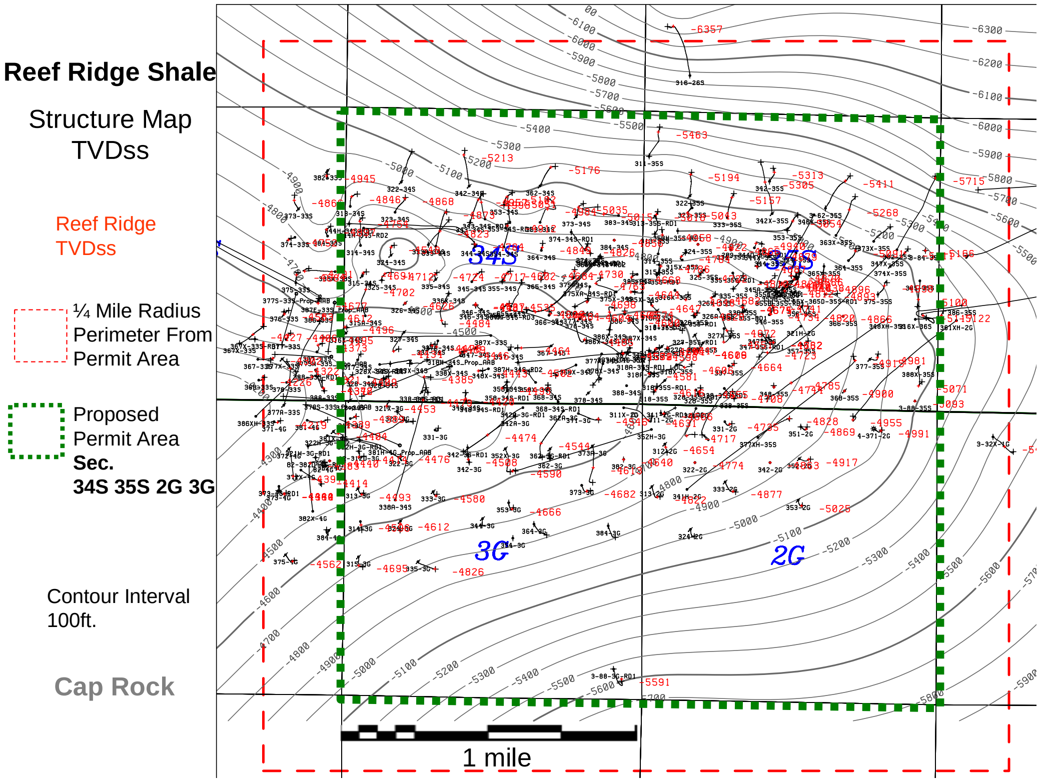
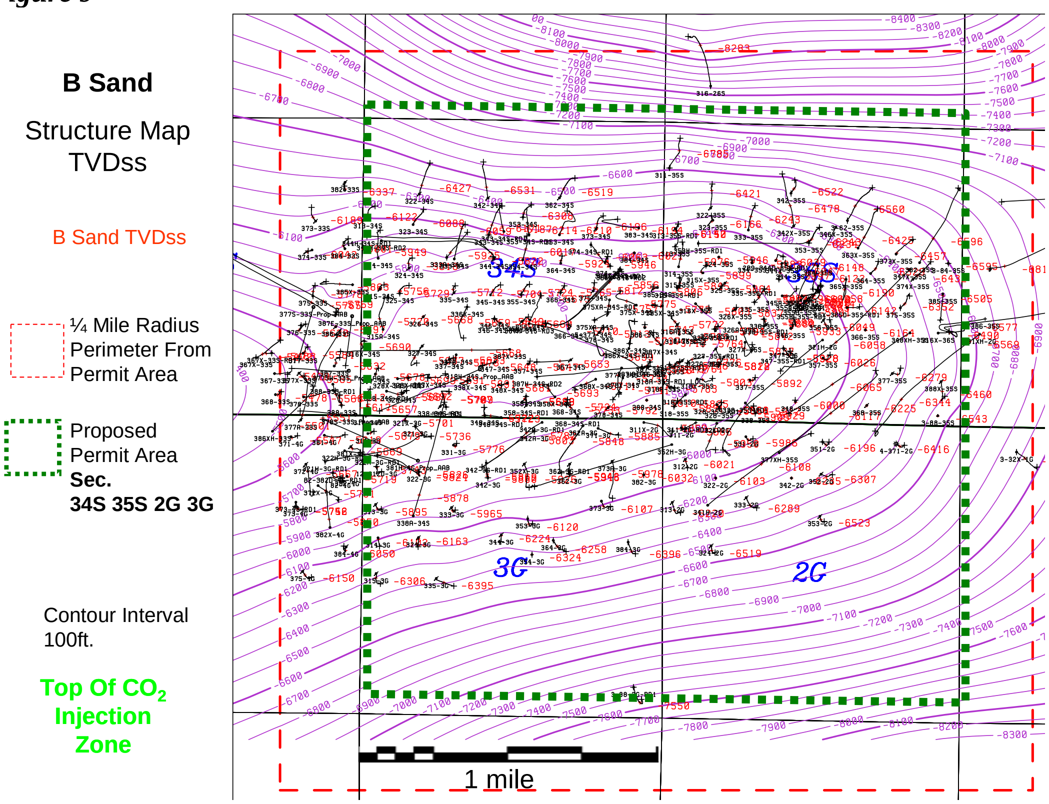


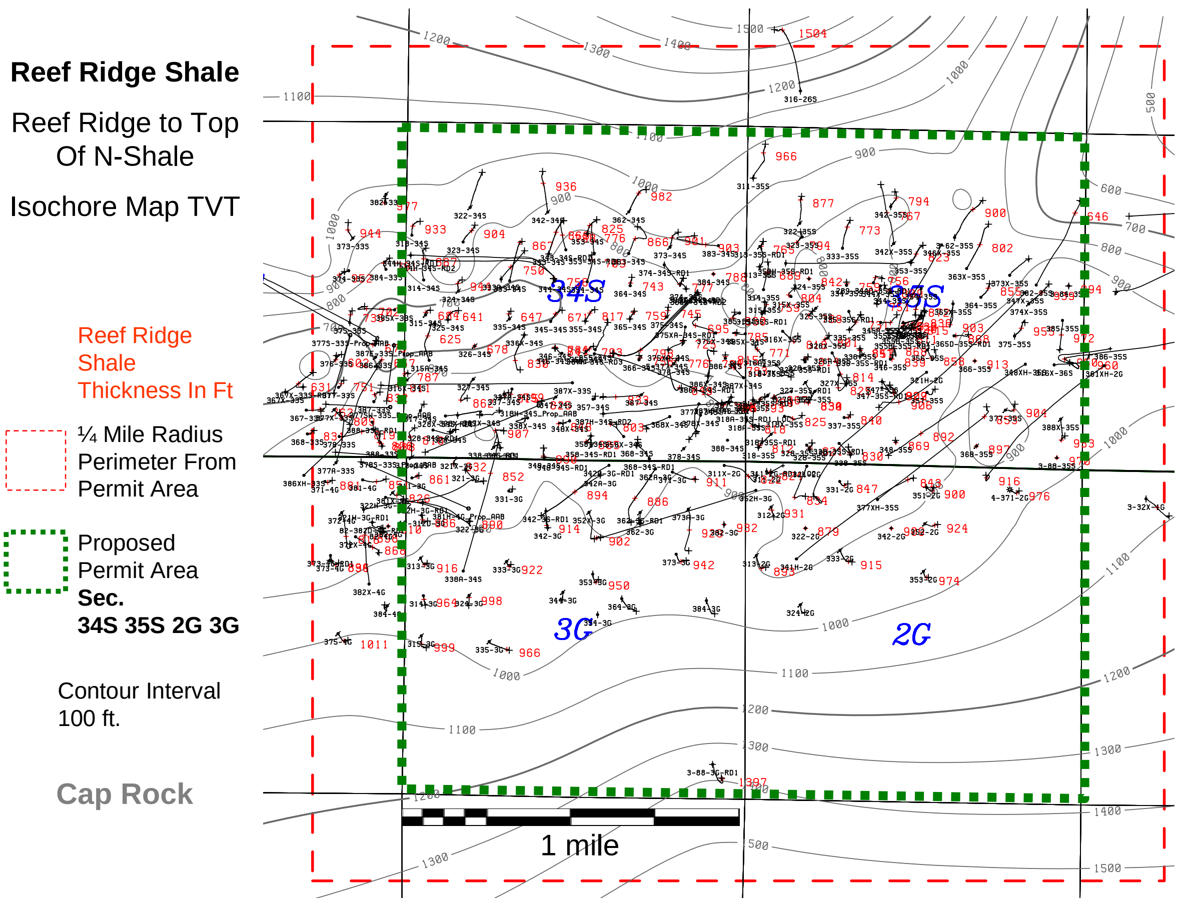
Figure 9



B.2. Isopachous Map

Figure 10 shows an isochore map illustrating the thickness of the cap rock above the injection zone. The contoured interval includes from the top of the Reef Ridge Shale to the top of the N Shale.

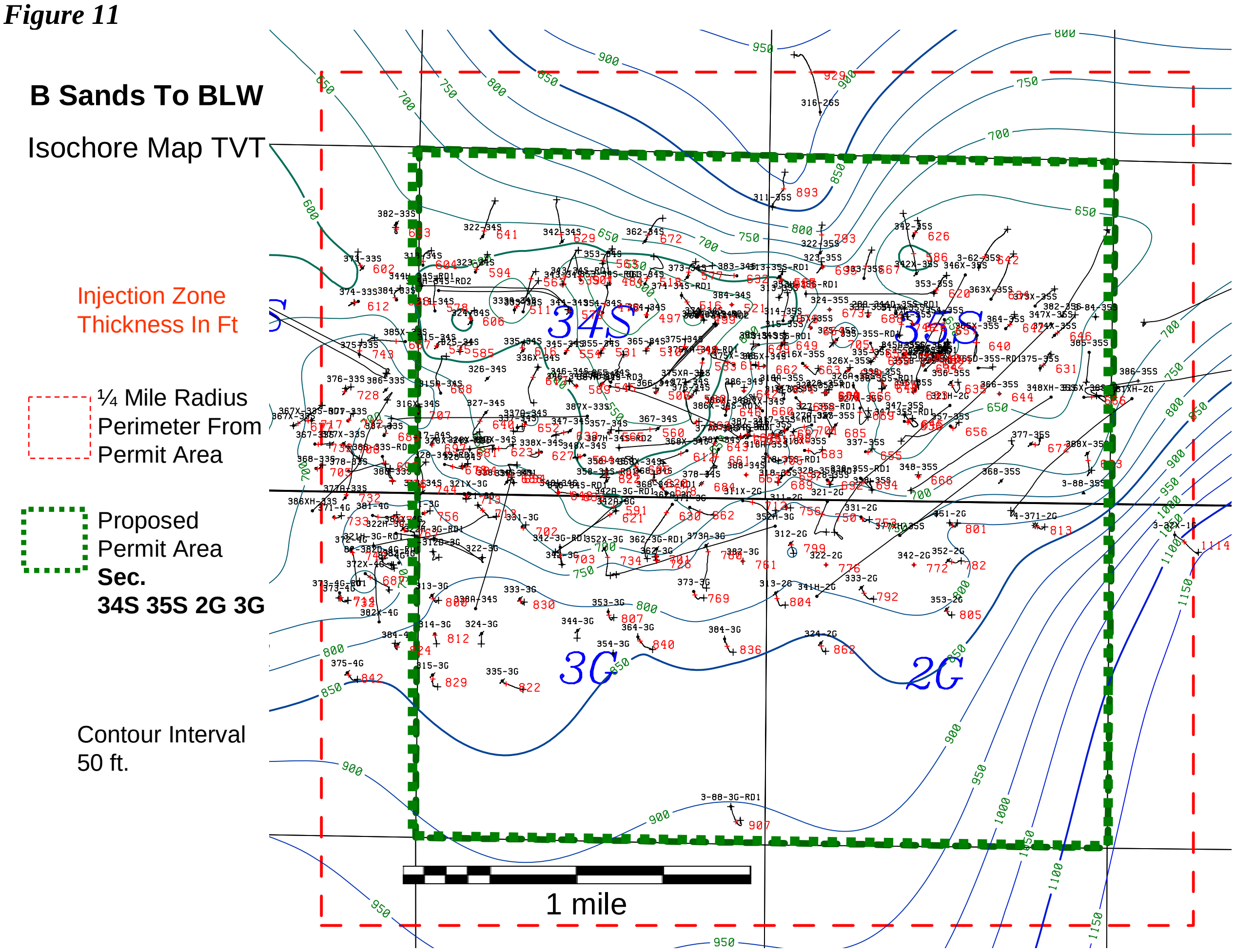
Figure 10



From the above figure, it can be observed that over the proposed permit area the cap rock ranges from 600 to 1,400 feet in thickness.

Figure 11 displays an isochore map of the target injection zone from the top of the B Sand to the base of the Lower Western sand (BLW).

Figure 11



Additional isochore maps of all horizons within the zone of proposed injection are located in Appendix G on a larger scale.

B.3. Geologic Cross Section from Surface to Deepest Zone Penetrated

Figure 12 shows two lines of geologic cross section, which are subsequently shown in Figures 13 and 14. Figure 13 displays a section from the surface to deepest zone penetrated. Figure 14 expands the proposed CO_2 injection zone to highlight the correlation of type log well 355A-35S.

Large scale Northwest–Southeast and Southwest–Northeast cross sections through the proposed permit area are provided in Appendix H.

Figure 12

Structure at top of CO2 Pilot Interval (UBB1 surface)

Reference for Lines of Structure and Stratigraphic Sections

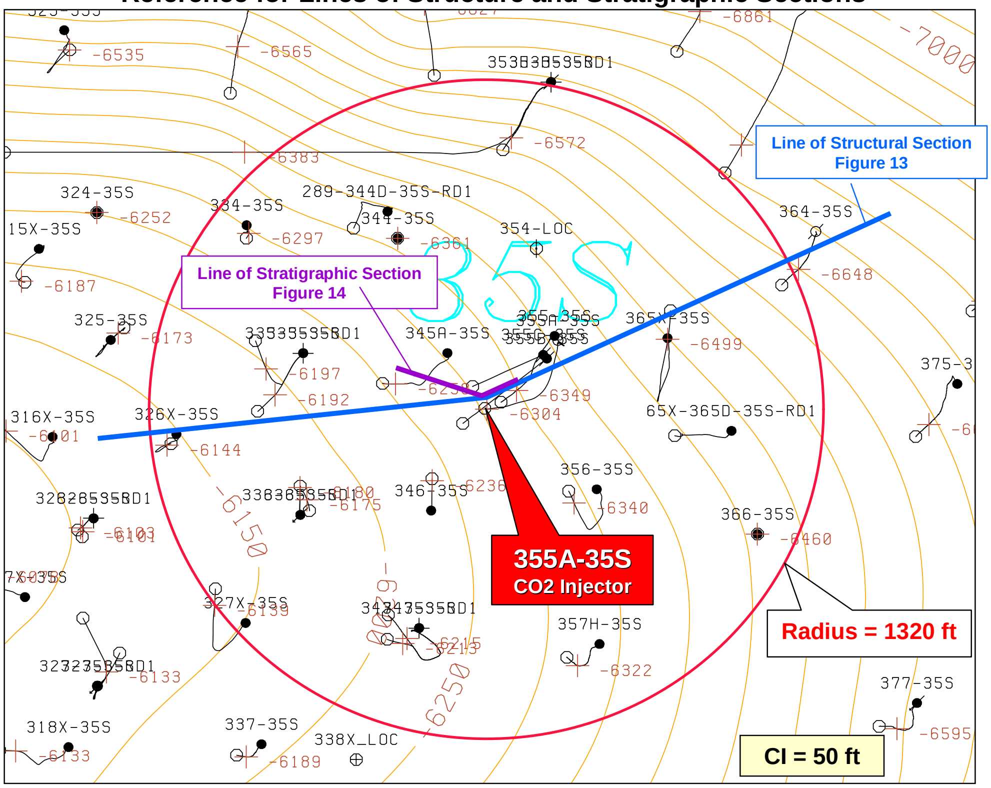


Figure 13. ***Structural Dip Section with CO2 Injector; Surface to TD***

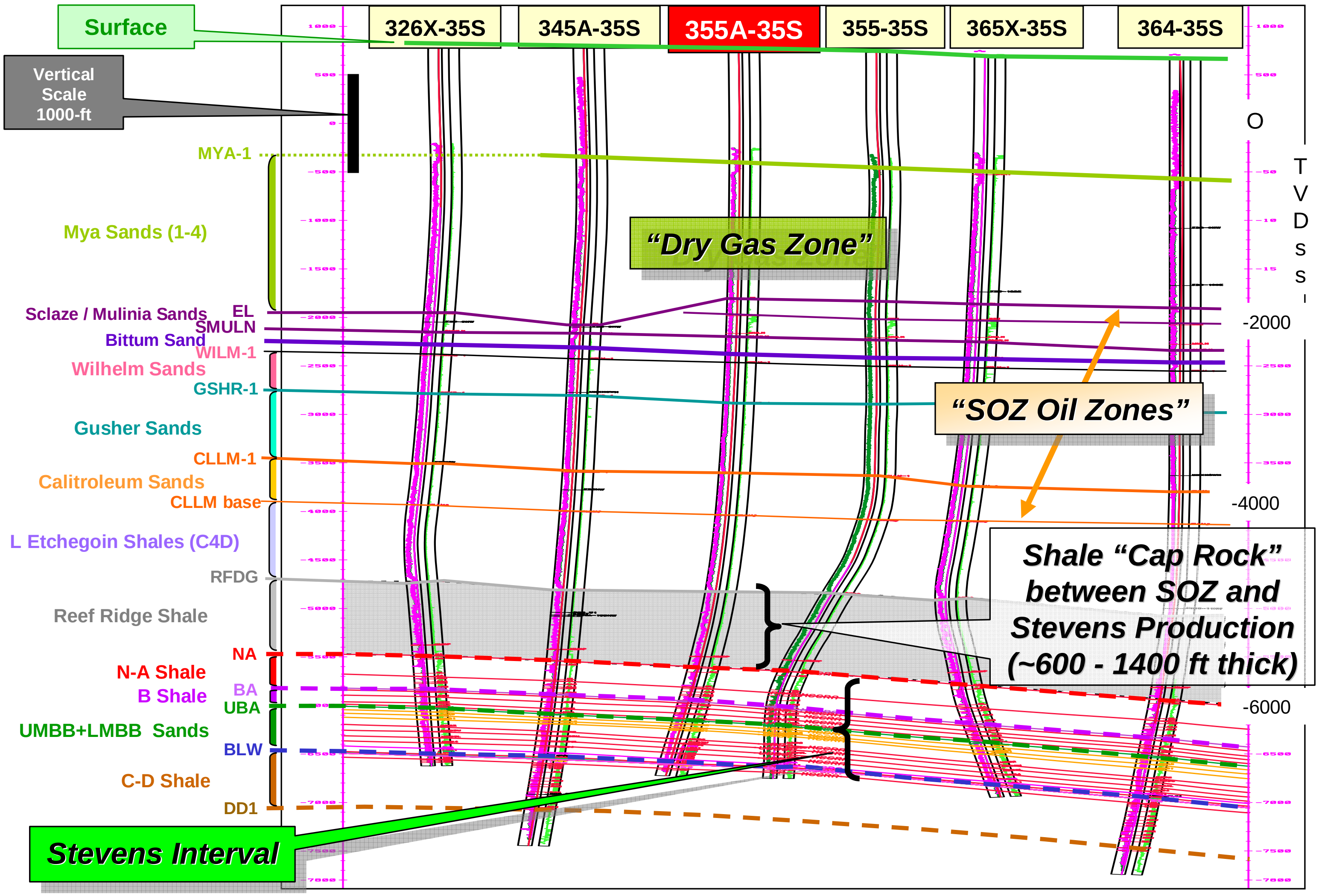
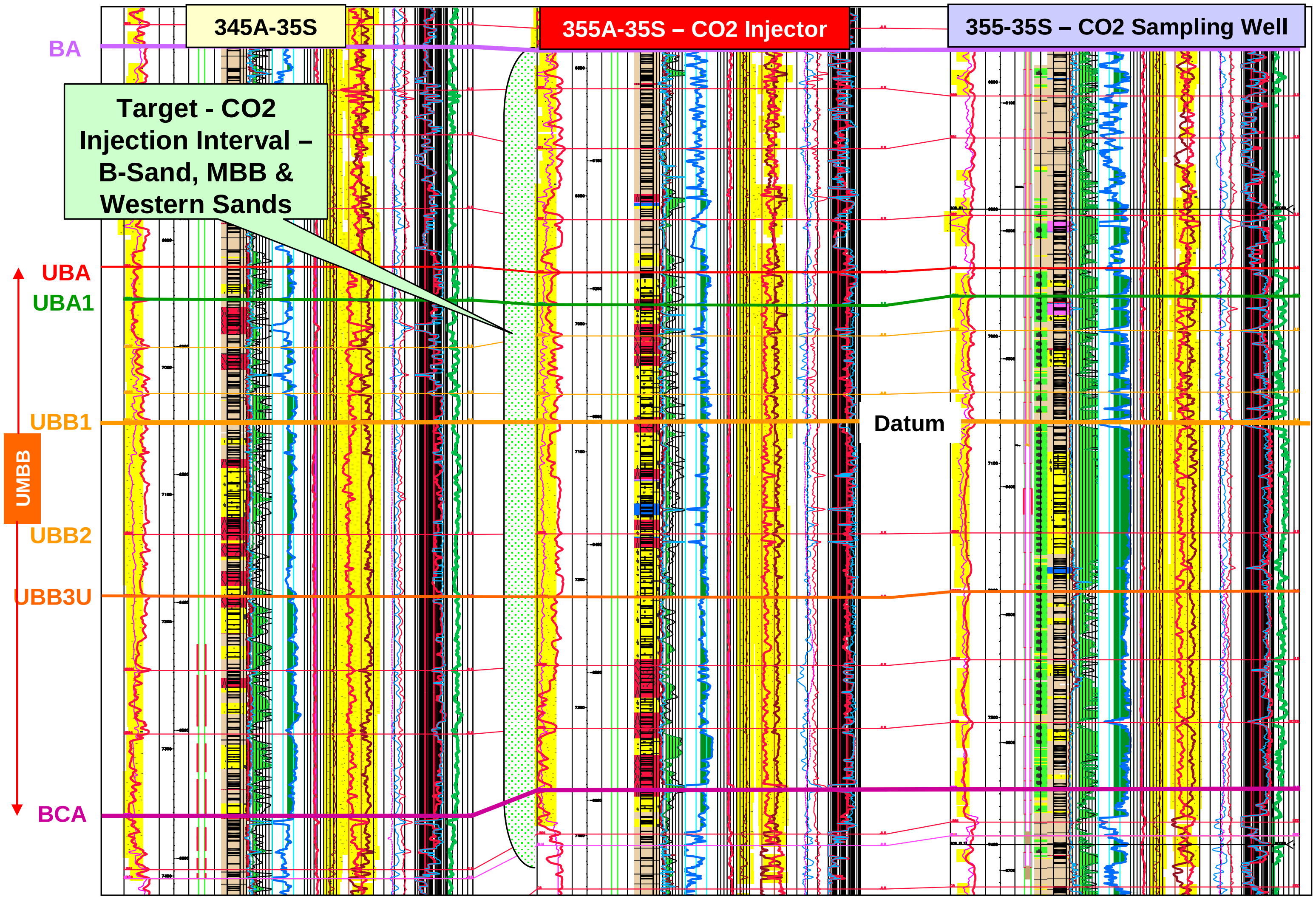


Figure 14. Stratigraphic Section through CO2 Injector, 355A-35S



B.4. Injection Well Electric Log

An electric log from pilot CO_2 injector 355A-35S with tops for all geologic units has been provided as a representative type log and is included in Appendix I.

B.5. Cap Rock Characteristics

Figure 13, previously shown, establishes the Reef Ridge shale as the cap rock for the Stevens reservoirs. The Reef Ridge is continuous across the 31S, 29R, and Northwest Stevens structures as illustrated by the isopach map shown in Figure 15. Continuity of the cap rock can be further observed by the cross section shown in Figure 16.

Figure 15

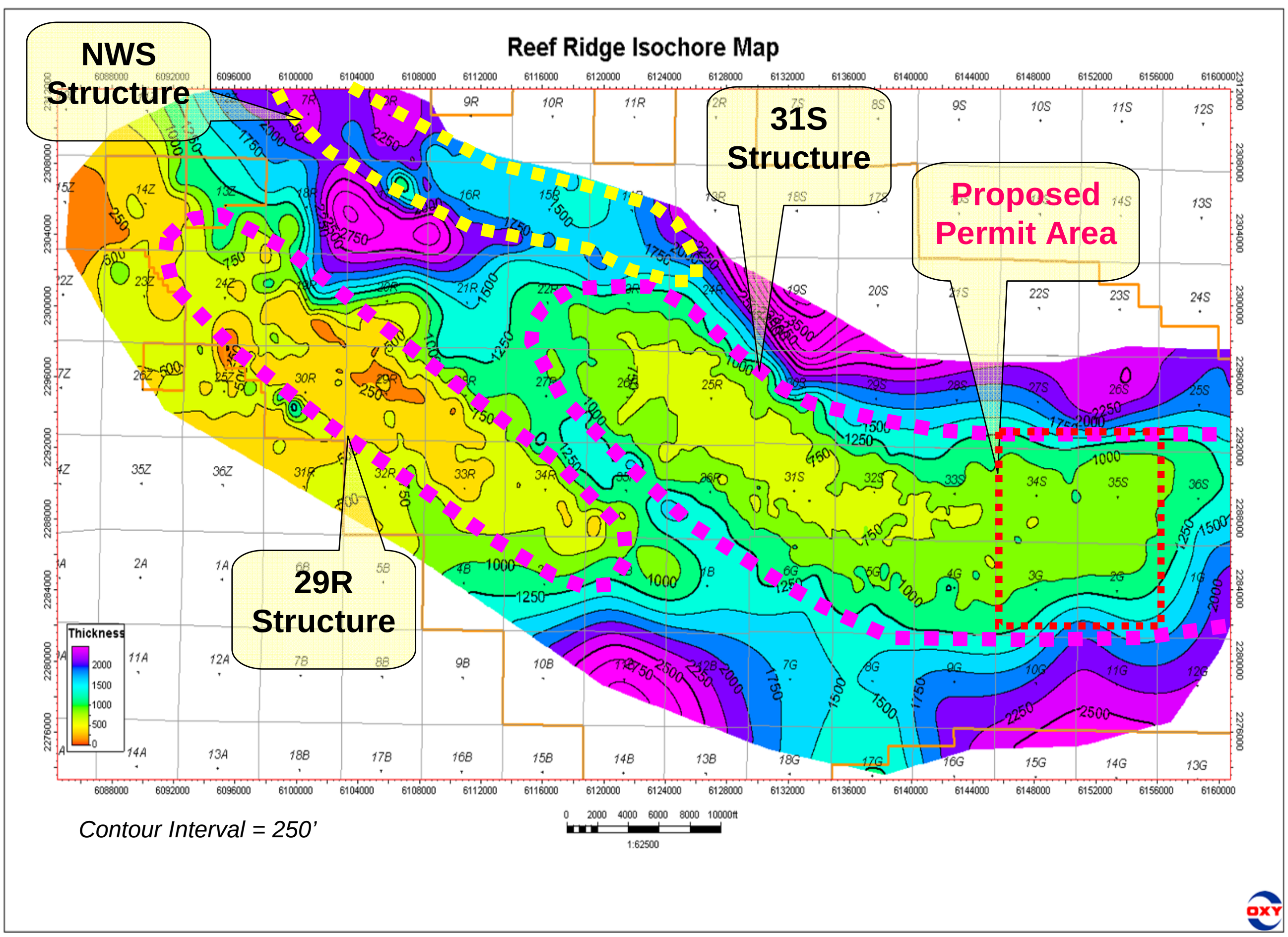
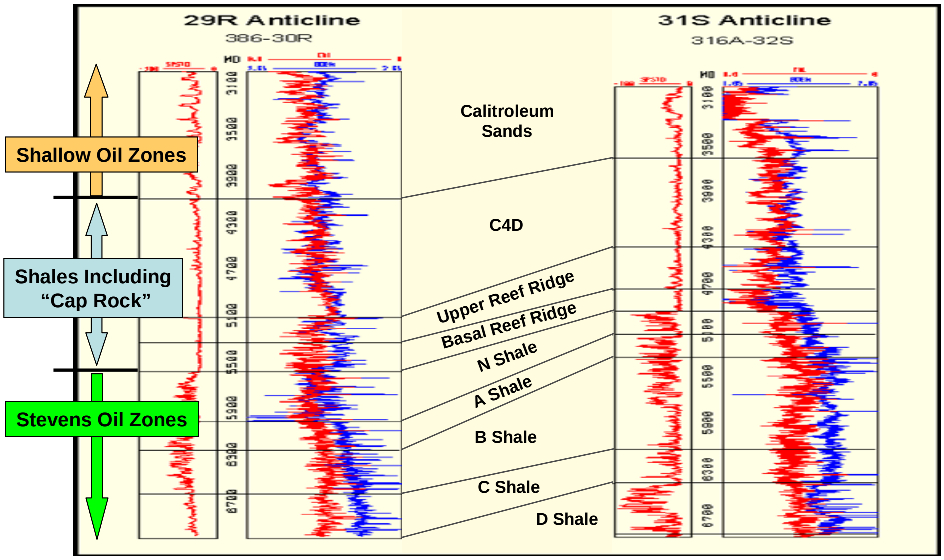


Figure 16. ***Shale Correlation Section***

Continuity from 29R to 31S Anticlinal Structures



Substantial and significant evidence exists that demonstrates the sealing characteristics of the Reef Ridge shale interval, including:

- Successful execution of CO_2 injection pilot program
- Physical rock characteristics of the Reef Ridge shale interval
- Fluid contacts and reservoir pressure differences
- Core analysis of the Reef Ridge shale interval
- Seismic control
- Geochemical analysis

CO_2 Injection Pilot

During 2005, OEHI conducted a 4-month CO_2 injection pilot in the Stevens reservoirs within the proposed permit area. Critical information was gained during this pilot program, including confirmation of CO_2 containment within the Stevens reservoir rock beneath the Reef Ridge shale interval.

Physical Characteristics

The following table displays the average Reef Ridge shale properties.

Table 3

Reef Ridge Shale Properties	
Deposition Environment	Deep Marine
Geologic Period	Miocene
Average Depth	4800 ft MD
Formation Temp (degrees F)	185
Rock Properties	
Average porosity %	30
Average permeabilty (MD)	<.01
KV/KH	0.001 est.

Fluid Contacts and Reservoir Pressure (Depletion)

Fluid contacts provide evidence of vertical compartmentalization between the Stevens reservoirs and over laying Eastern Shallow Oil Zone (ESOZ) reservoirs. The original oil water contacts for the two reservoirs varied by over 3000 ft subsea true vertical depth. In addition, development histories of each reservoir, including but not limited to gas blowdown and water injection schemes have been implemented without influencing pressure or production performance across the Reef Ridge cap rock. The following table shows average reservoir pressures for ESOZ reservoir intervals, which overlie the proposed permit area above the Reef Ridge shale.

Table 4

2006 Reservoir Pressure Data

SOZ Reservoir

35N-34S	TVD	Pres (psia)	*pressure gradient* psi / TVD
MYA4	2710	711	0.26
SS1	2985	83	0.03
SS2	3075	148	0.05
Mulina	3155	113	0.04

Wells Separated Vertically By Reef Ridge Shale

Stevens Reservoir

337A-34S	TVD	Pres (psia)	*pressure gradient* psi / TVD
N-Shale	6360	2,905	0.46
A-Shale	6690	2,882	0.43
B-Shale	6715	3,654	0.54
UBA	6855	3,760	0.55
UBB1	7045	3,842	0.55
UBB3U	7125	3,877	0.54

Distance Between 35N-34S & 337A-34S ~ 1,400 ft laterally

Core Analysis

As demonstrated above, the Reef Ridge shale is a laterally continuous member across the Elk Hills Unit. Core data from 348AH-31S was collected in two 30 foot intervals through the 870 feet thick Reef Ridge shale. The core analysis is presented in Figures 17 – 19. Figure 17 displays results from a mineralogy analysis within this zone. As shown in Figure 17, in both the upper and lower portion of the core analysis, the most predominant secondary mineral is clay, which inhibits fracturing of the porcelaneous materials. The data in these figures support the sealing capacity of the Reef Ridge shale.

Figure 17

Oxy of Elk Hills
348AH-31S

File N

PETROLE

FTIR Mineralogy
(Weight Percent)

Core	Top Depth - Btm Depth	Density (g/cc)	Quartz	Albite	Oligoclase	Andesine	K-Feldspar	Calcite	Dolomite	Pyrite	Opal-A	Opal-CT	Chert	Cristobalite	Total Clay	Kaolinite	Chlorite
Core #1	4503.0 - 4504.1	2.47	0	7	0	5	11	0	1	1	0	43	10	0	22	8	0
	4504.1 - 4505.1	2.38	0	8	0	3	9	0	0	0	0	68	0	0	12	5	0
	4505.1 - 4506.0	2.78	0	0	0	0	0	10	69	0	0	0	14	0	7	0	0
	4506.0 - 4508.0	2.42	0	7	0	3	13	0	0	2	0	43	0	18	14	7	0
	4508.0 - 4509.3	2.46	0	8	0	6	12	2	0	2	0	44	8	0	18	6	0
	4509.3 - 4510.0	2.49	0	7	0	3	9	0	11	2	0	46	8	0	14	6	0
	4510.0 - 4511.0	2.43	0	8	0	3	11	0	1	2	0	44	0	15	16	6	0
	4511.0 - 4512.2	2.42	0	6	0	3	13	0	0	2	0	43	0	15	18	6	0
	4512.2 - 4513.3	2.39	0	8	0	4	10	0	0	0	0	63	0	0	15	3	0
	4513.3 - 4514.0	2.41	4	0	0	0	17	0	0	0	0	51	0	0	28	0	0
	4514.0 - 5414.5	2.44	0	6	0	4	11	0	0	2	0	43	0	13	21	6	0
	5414.5 - 4516.5	2.40	0	0	0	6	12	0	0	0	0	48	0	15	19	4	0
	4516.5 - 4518.0	2.44	0	6	0	2	12	0	0	2	0	39	0	16	23	8	3
	4518.0 - 4519.5	2.45	0	0	0	8	14	0	0	0	0	42	9	0	27	5	0
	4519.5 - 4520.0	2.45	0	7	0	11	12	2	0	1	0	50	0	0	17	5	0
	4520.0 - 4521.0	2.44	0	8	0	0	13	1	0	2	0	43	0	17	16	7	4
	4521.0 - 4522.0	2.47	0	10	0	7	12	0	0	2	0	46	10	0	13	5	0
	4522.0 - 4522.7	2.49	0	8	0	7	10	2	0	2	0	39	10	0	22	7	0
	4522.7 - 4523.5	2.43	0	6	0	9	10	0	0	1	0	55	0	0	19	6	0
Core #2	5017.0 - 5018.0	2.55	4	0	0	6	10	0	0	2	0	17	37	0	24	7	0
	5018.0 - 5018.5	2.55	0	0	0	4	10	0	0	2	0	0	42	22	20	6	0
	5018.5 - 5019.0	2.52	0	0	0	3	10	2	0	1	0	12	38	14	20	5	0
	5019.0 - 5019.5	2.52	0	0	0	3	9	2	0	1	0	13	38	13	21	5	0
	5019.5 - 5019.7	2.61	0	0	0	6	9	3	0	2	0	0	48	0	32	7	0
	5019.7 - 5020.2	2.56	5	0	0	2	10	0	2	1	0	19	40	0	21	5	0
	5020.2 - 5020.8	2.62	7	0	0	4	10	2	0	2	0	0	49	0	26	6	0
	5020.8 - 5021.9	2.62	3	0	0	3	9	0	2	2	0	0	55	0	26	5	0

Figure 18 displays a core analysis of this same zone. Although porosity values, shaded green, are relatively high, this is non-effective porosity and has little impact on the permeability of porcelaneous shale or chert. Low permeability is verified by the absence of oil saturation, shaded yellow. This data indicates that as zones below the Reef Ridge were being "charged" with hydrocarbons, the permeability of the Reef Ridge was sufficiently low to prevent hydrocarbon migration.

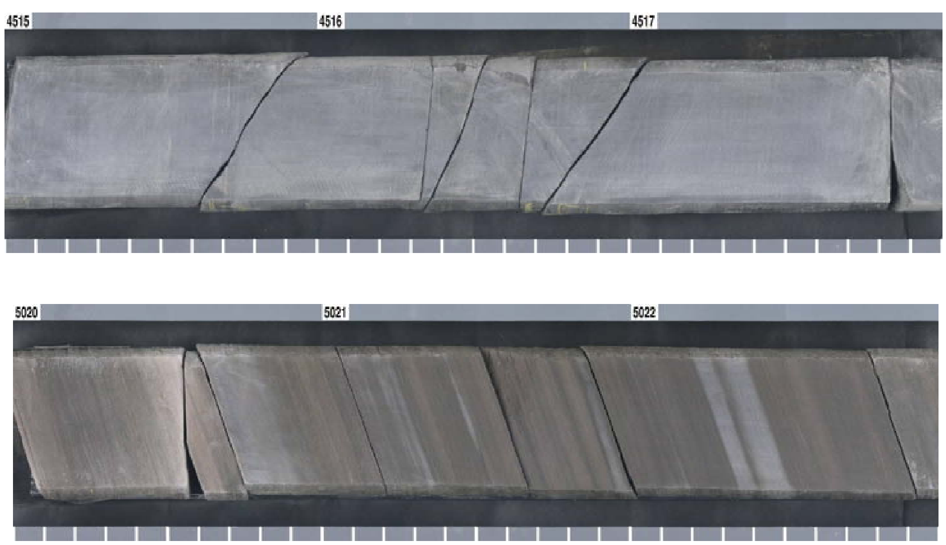
Figure 18

OXY of Elk Hills, Inc.
348AH-31S
Elk Hills Field

CL File No. : 571

Core	Sample No.	Depth ft	Porosity (BV-GV) %	Saturation Oil %	Saturation Water %	O/W Ratio	Total Liquid %	Grain Den g/cc	Description
Core #1	111	4516.5	27.4	0.0	96.8	0.0	96.8	2.46	Shale dk gry slty no stn no flu
	112	4518.0	25.3	0.0	99.0	0.0	99.0	2.54	Shale dk gry slty no stn no flu
	113	4519.5	23.1	0.0	94.2	0.0	94.2	2.56	Shale dk gry slty no stn no flu
	114	4520.0	27.7	0.0	96.2	0.0	96.2	2.46	Shale dk gry slty no stn no flu
	115	4521.0	29.1	0.0	97.0	0.0	97.0	2.42	Shale dk gry slty no stn no flu
	116	4522.0	28.8	0.0	95.2	0.0	95.2	2.52	Shale dk gry slty no stn no flu
	117	4522.7	28.1	0.0	87.1	0.0	87.1	2.50	Shale dk gry slty no stn no flu
Core #2	118	5017.0	27.8	1.2	93.7	0.0	95.0	2.60	Shale lt brn slty m stn vdull or flu-no vis
	119	5018.0	39.4	0.0	96.0	0.0	96.0	2.60	Shale dk gry slty no stn no vis flu
	120	5018.5	40.7	0.0	97.9	0.0	97.9	2.59	Shale dk gry slty no stn no vis flu
	121	5019.0	38.8	0.0	96.7	0.0	96.7	2.60	Shale dk gry slty no stn no vis flu
	122	5019.5	32.9	0.0	96.0	0.0	96.0	2.63	Shale dk gry slty no stn no vis flu
	123	5019.7	31.2	0.0	96.2	0.0	96.2	2.59	Shale dk gry slty no stn no vis flu
	124	5020.2	32.2	0.0	99.1	0.0	99.1	2.59	Shale dk gry slty no stn no vis flu
	125	5020.8	38.9	0.0	95.4	0.0	95.4	2.58	Shale dk gry slty no stn no vis flu
	126	5021.9	24.1	0.0	97.5	0.0	97.5	2.59	Shale dk gry slty no stn no vis flu
	127	5022.5	34.6	0.0	97.2	0.0	97.2	2.56	Shale dk gry slty no stn no vis flu
	128	5023.0	41.1	0.0	96.6	0.0	96.6	2.57	Shale dk gry slty no stn no vis flu
	129	5023.8	25.0	0.0	95.1	0.0	95.1	2.61	Shale dk gry slty no stn no vis flu
	130	5024.2	31.9	0.0	94.6	0.0	94.6	2.61	Shale dk gry slty no stn no vis flu
	131	5024.7	24.5	0.0	94.5	0.0	94.5	2.59	Shale dk gry slty no stn no vis flu
	132	5025.0	36.5	0.0	95.1	0.0	95.1	2.61	Shale dk gry slty no stn no vis flu
	133	5025.6	31.4	0.0	94.3	0.0	94.3	2.62	Shale dk gry slty no stn no vis flu
	134	5026.8	36.7	0.0	97.5	0.0	97.5	2.59	Shale dk gry slty no stn no vis flu
	135	5027.6	25.1	0.0	87.0	0.0	87.0	2.62	Shale dk gry slty no stn no vis flu
	136	5028.0	28.5	0.0	97.0	0.0	97.0	2.62	Shale dk gry slty no stn no vis flu
	137	5029.5	31.0	0.0	77.3	0.0	77.3	2.62	Shale dk gry slty no stn no vis flu
	138	5029.7	30.4	0.0	97.1	0.0	97.1	2.61	Shale dk gry slty no stn no vis flu

Figure 19



Reef Ridge Shale Core – 348AH-31S

** Fractures Seen In Core Photos Are Drilling Induced*

<u>Seismic Control</u>

Further evidence of the sealing characteristics of the Reef Ridge shale can be observed in the following seismic section. The diagram illustrates that faults above and below the Reef Ridge shale terminate before penetrating the Stevens cap rock interval.

Figure 20

31S Seismic Section

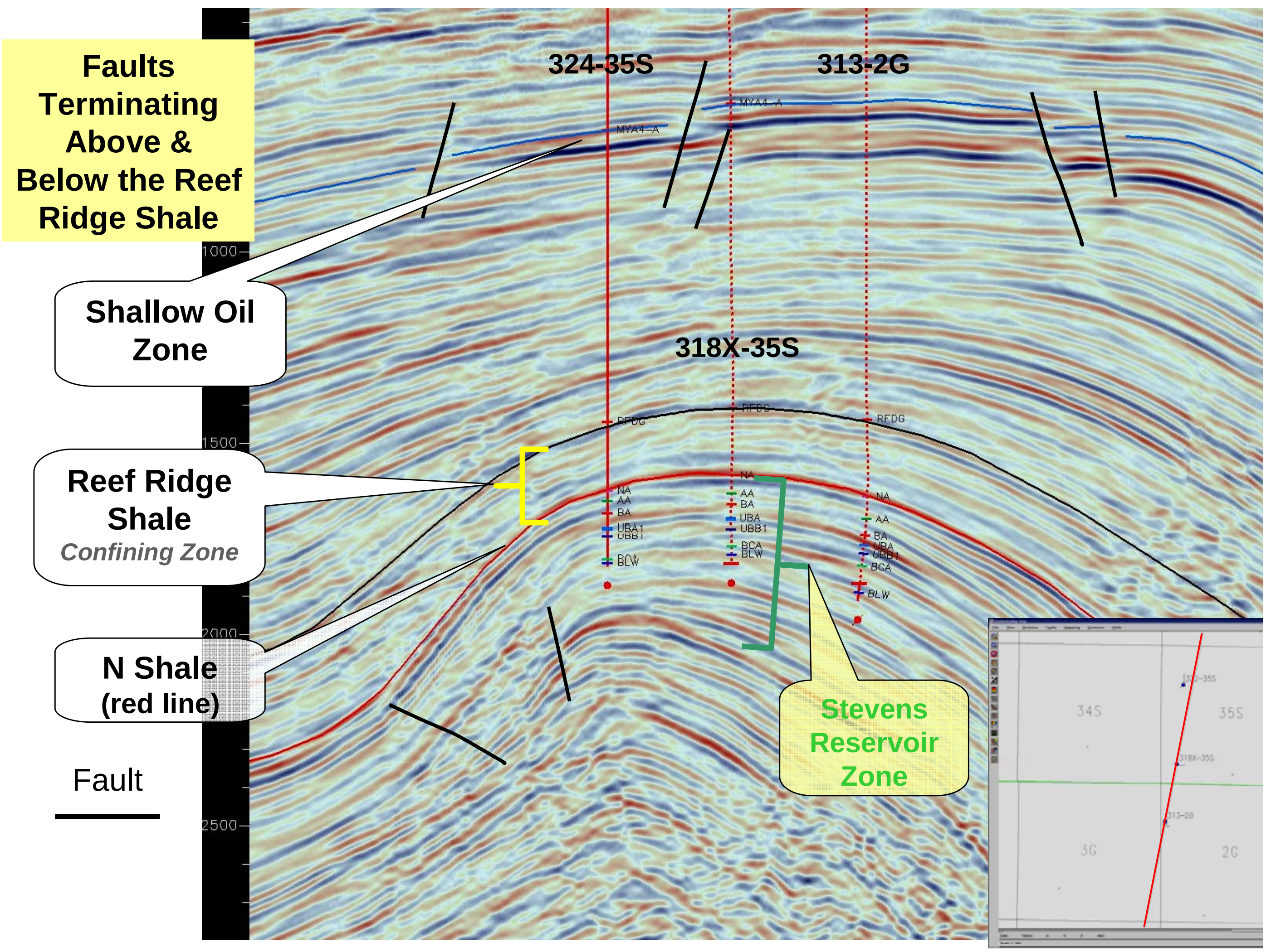
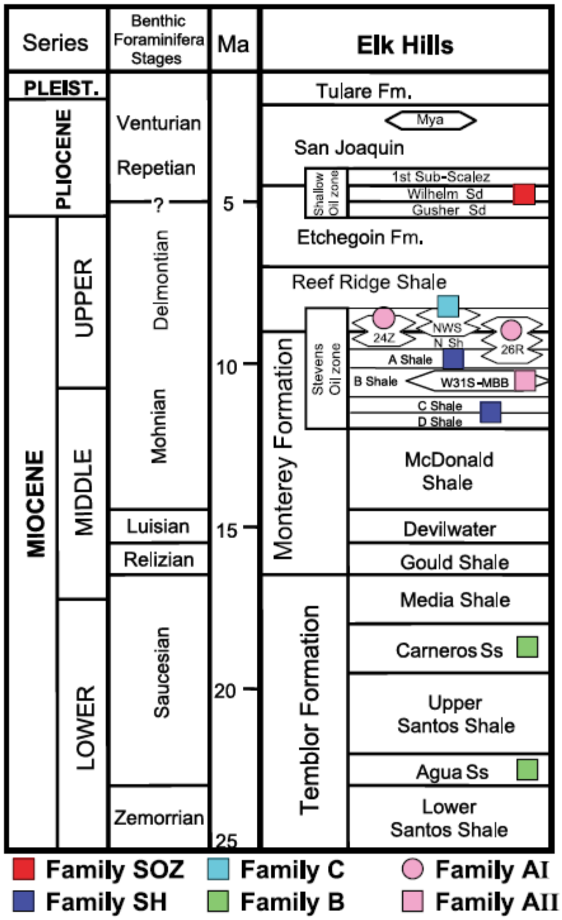


Figure 21



Geochemical Analysis Control

Geochemical analysis further supports vertical isolation between the Stevens and SOZ reservoirs. Zumberge, Russell and Reid documented (Appendix J) geochemical data along with their analysis of 66 oil samples from the Elk Hills field. Cluster analysis revealed five distinct oil families sourced from the Miocene Monterey Formation and tied to stratigraphic intervals (see Figure 21, from Zumberge et al). The distinct geochemical compositions of the Stevens and SOZ oils among the other oil "families" identified suggests "minimal upsection, cross stratigraphic migration" (Appendix J, pg. 1370). The authors conclude by stating that hydrocarbon migration into the SOZ reservoirs is not the result of leakage from the older, Miocene reservoirs.

C. Injection Plan

C.1 Maximum Anticipated Number of Injection Wells for the Project:

Initial project plans call for an anticipated maximum of 80 injection wells in the requested permit area. Each injection well will function as a central injection point surrounded by or between three to five offsetting production wells thereby limiting the migration of injected fluids outside of each injection pattern.

C.2 Maximum Anticipated Daily Injection Volume for the Project:

The maximum anticipated injection rate into the requested permit area (including CO_2 recycle) is 400 MMSCF of CO2 per day and 250,000 barrels of water per day.

C.3 Maximum Anticipated Surface Injection Pressure and Rate by Well:

It is anticipated that maximum surface injection pressure will be 3,500 psi and will not exceed the existing waterflood permit gradient of 0.8 psi per foot of depth. The maximum injection rate at any injection well is anticipated to be 20 MMSCF of CO_2 per day and 10,000 barrels of water per day.

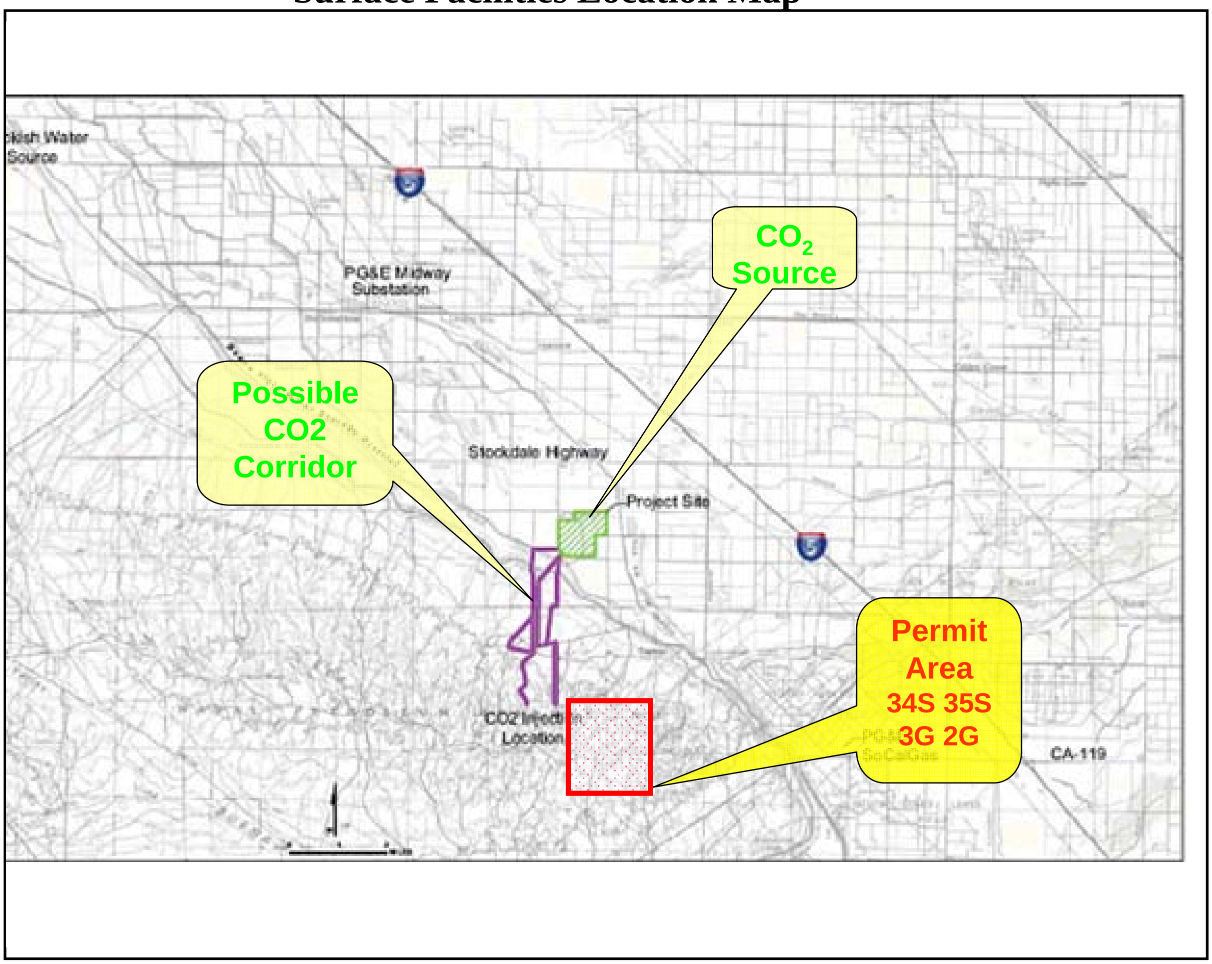
C.4 CO_2 Injection Facilities

Injection Facilities Locator Map

The finalized placement of the CO2 pipeline route from the generation facility (HECA plant) has not yet been confirmed, however Figure 23 illustrates likely potential pipeline routes from the approximate location of the CO_2 generation facility to the proposed permit area.

Figure 23

Surface Facilities Location Map



C.5, 7, 8, 9 Monitoring Systems to Ensure Safety:

Please see Appendix A for a description of the various components that comprise OEHI's strategy to ensure safe and secure implementation and operation of the Oxy CO2 Project at Elk Hills Field.

C.6 Proposed Method of Injection:

Delivery into each injector will be through tubing using multiple packers, injection control valves, and other means of injection profile modifications as deemed necessary. Significant upgrades will be made to existing surface facilities to ensure adequate capacity for the collection, processing, and distribution of produced injectants (water and/or CO_2).

D. Notice to Offset Operators

There are no Offset Operators; consequently, there has been no correspondence.

E. Other Data Requested

Appendix A: Elk Hills Stevens CO_2 Class II UIC Permit Supplement

Appendix B: DOGGR Dual Steamflood / Waterflood Project Stevens Zone Permit #22800006 and DOGGR Dual Waterflood / CO_2 Project Permit # 22800021

Appendix C: Completion and status map of all wells that have penetrated the Reef Ridge Shale indicating active or inactive producers and injectors, and abandoned wellbores.

Appendix D: Wellbore and casing diagrams within a ¼ mile radius of proposed project boundaries of all wells penetrating the Reef Ridge Shale (Cap Rock).

Appendix E: List of wells within a ¼ mile radius of the proposed permit area that do not penetrate the Reef Ridge Shale. Included are API#, year of completion, status, and TD (TVDss).

Appendix F: Structural contour maps for each unit and sub-unit from the Reef Ridge Shale (cap rock) to the BLW (base of the injection zone).

Appendix G: Isochore maps for the reef ridge (cap rock) and all major zones of injection through the BLW (base of the injection zone).

Appendix H: Northwest – Southeast cross section and a Northeast – Southwest cross section through the proposed permit area

Appendix I: A 2-inch type log of 355A-35S with interpreted geologic markers listed.

Appendix J: AAPG Bulletin: *Charging of Elk Hills reservoirs as determined by oil geochemisty*