

## **APPENDIX 7: P&A PROCEDURE FOR WELLS TO BE ABANDONED PRIOR TO INJECTION CTV VI**

Carbon TerraVault Holdings, LLC (CTV) will abandon two wells within the area of review (AoR) prior to injection of carbon dioxide (CO<sub>2</sub>) to isolate the Injection Zone from other permeable reservoirs and to ensure confinement through the Confining Zone. **Appendix 6** provides the list of all wells within the AoR and indicates which wells will be abandoned prior to injection. This appendix provides the plugging and abandonment procedures to demonstrate that plugging will ensure isolation of the Injection Zone.

Abandonment operations will be conducted using methods designed to prevent the movement of fluid into underground sources of drinking water (USDWs) and will include the use of materials compatible with the carbon dioxide stream. As these are oil and gas wells regulated through CalGEM primacy, procedures and cement plug placement will also adhere to regulations established within the California Code of Regulations, Chapter 4, Article 3, §1723.

### **1. Plugging Procedures**

The following procedures describe the proposed plugging operations:

1. Blowout prevention equipment (BOPE) is installed on the wellhead.
2. Downhole production or injection equipment is removed from the casing, and the well is cleaned out to plugback measured depth (PBMD). The cleanout depth will be witnessed by CalGEM and approved.
3. Plug 1 will be placed from the approved cleanout depth across the production interval and >100 feet into the confining layer. The plug will be tagged and witnessed by CalGEM to ensure that the plug depth and length satisfy permit requirements.
4. Plug 2 will be placed across the top of the Dissipation Zone and >100 feet into the overlying formation. The plug may or may not be required by CalGEM, and the plug may be tagged and witnessed accordingly by CalGEM to ensure that the plug depth and length satisfy permit requirements.
5. Plug 3 will be placed as a balanced plug at the base of the USDW in the Santa Margarita Sandstone. The plug will be extended to cover >100 feet above the base of the USDW. The plug will be tagged and witnessed by CalGEM to ensure that the plug depth and length satisfy permit requirements.
6. Plug 4 will be placed such that the surface plug is >25 feet in length, and well casing can be cut off between 5 and 10 feet from surface. The surface plug will be witnessed and approved by CalGEM.
7. BOPE will be removed, and well casing will be cut between 5 and 10 feet below surface.
8. A steel plate will be stamped with the last five digits of the American Petroleum Institute (API) well number for identification. The steel plate will be at least as thick as the outer well casing, and it will be welded around the circumference.

All portions of the well not plugged with cement are filled with inert mud meeting specifications according to California Code of Regulations, Chapter 4, Article 3, §1723(b) to prevent migration of fluids within the wellbore.

## 2. Plugging Details for Wells to be Abandoned

Well-specific plugging plans are provided in the following tables for each well to be abandoned prior to CO<sub>2</sub> injection. Cement type, volume, density, and placement method for each plug described above are indicated. The indicated top and bottom plug depths necessary to ensure isolation of the injection zone and meet CalGEM abandonment requirements are determined based on the well-specific measured depths of the relevant geologic formations described above.

**Table 1. Plugging Details for Britton 1**

	Plug 1a	Plug 1b	Plug 2	Plug 3	Plug 4
Hole Size (inches)	7.875	7.875	7.875	7.875	7.921
Bottom of tubing (feet)	7,781	5,734	3,280	2,814	42
Cement Volume (sacks)	69	419	37	67	8
Slurry Volume (bbl)	14.04	85.67	7.53	13.55	1.52
Slurry Weight (lb/gal)	15.8	15.8	15.8	15.8	15.8
Top of plug (feet)	7,674	4,312	3,155	2,589	17
Bottom of Plug (feet)	7,907	5,734	3,280	2,814	42
Type of Cement	Class G	Class G	Class G	Class G	Class G
Method of placement	Balanced Plug, Retainer, or CT Plug				

**Table 2. Plugging Details for Hotchkiss 15-2**

	Plug 1	Plug 2	Plug 3	Plug 4
Hole Size (inches)	11.75	11.75	11.75	12.625
Bottom of tubing (feet)	5,716	3,461	2,895	41
Cement Volume (sacks)	801	82	148	19
Slurry Volume (bbl)	163.89	16.76	30.18	3.87
Slurry Weight (lb/gal)	15.8	15.8	15.8	15.8
Top of plug (feet)	4,494	3,336	2,670	16
Bottom of Plug (feet)	5,716	3,461	2,895	41
Type of Cement	Class G	Class G	Class G	Class G
Method of placement	Balanced Plug, Retainer, or CT Plug			