



**COLORADO**  
Department of Public  
Health & Environment

Mr. Jay Brown  
Thornton, LLC  
2503 Crawford Avenue, #102  
Evanston, Illinois 60201

Sent via email to [jaylon7@gmail.com](mailto:jaylon7@gmail.com)

April 8, 2021

**RE: Thornton, LLC BOS-100 injections - predrill method accepted  
File - EPA ID # COR000212639**

Dear Mr. Brown:

This letter approves of your and Thornton, LLC (collectively, “Thornton, LLC”)’s request to use a “pre-drilling” method endorsed by RPI in order to overcome geologic refusal of the direct push rig in Thornton Shopping Center offsite remediation. The Colorado Department of Public Health and Environment (CDPHE) approves of the use of this method. This approval is only for planned injections in 2021 in offsite areas OFS-1, OFS-2, OFS-3, OFS-4, OFS-5, and OFS-6 and is intended to help ensure completion of injections of BOS-100 treatments. Thornton, LLC has until April 30, 2021 for the first phase of this work to be completed. On April 6, 2021, Thornton, LLC and its contractor R3 represented to CDPHE that this work will be completed on time and no extension is needed. Completion of all planned off-site BOS-100 injections is required by June 1, 2021. CDPHE does not expect further delays.

Based on the information presented to CDPHE by RPI Group President Scott Noland, information provided by Thornton, LLC and Mr. Harp, and RPI’s 2020 “pre-drill” webinar, CDPHE approves of this request. Specifically, **CDPHE approves of the use of the predrill method in the CAP as amended in 2020 for off-site areas (OFS-1, OFS-2, OFS-3, OFS-4, OFS-5, and OFS-6) where the direct push rig encounters refusal.** Accordingly, CDPHE provides approval of the use of the “pre-drill” method instead of packers to complete unfinished BOS-100 injections in OFS-1, OFS-2, and OFS-3; CDPHE also approves of the use of the “pre-drill” method in OFS-4, OFS-5, and OFS-6. Because of this mid-work change in technology, Thornton, LLC shall:

1. Attempt to use direct push initially. If direct push is unsuccessful, then the “pre-drill” method shall be used to reattempt injection and delivery of BOS-100. BOS-100 shall be delivered as a slurry.
2. Photograph, document, record any daylighting of product or heaving. Location and depth shall be recorded in field notes. The volume daylighted shall be estimated and recorded in field notes. If BOS-100 is not injected at each location and every depth, the locations and depths where “pre-drill” application of BOS-100 was unsuccessful shall be reported and discussed in the August 2021 report to CDPHE. These locations may later need to be offset and receive additional injections to ensure complete dosing. Doubling up on injection volumes in the next injection depth interval is not recommended; if volumes change too much, spacing will be affected.



3. Do not inject using the “pre-drill” technique at less than 10 feet below ground surface (bgs), without prior consultation with CDPHE.
4. Work from the top to down when injecting BOS-100 to optimize horizontal distribution in the subsurface. The type of pressure tip and other equipment used to inject the BOS-100 injections with the “pre-drill” method shall be recorded and reported in the August 2021 report to CDPHE. The type of injection tip used should be tailored to individual lithology. The rationale for injection tip selection shall be explained in this report. For example, how many holes and of what diameter were used for the injection tip?
5. Record and report flow rate and pressure in the August 2021 report.
6. Properly label, characterize, store, secure, transport, and dispose of investigation derived waste in accordance with applicable laws and regulations. This must be discussed in the August 2021 report to CDPHE. Waste manifests shall be provided to CDPHE in the August 2021 documenting the proper disposal of any soil and hazardous waste.
7. Collect two post-injection soil cores from each off-site area, OFS-1, OFS-2, OFS-3, OFS-4, OFS-5, and OFS-6 by July 20, 2021, log lithology, and analyze for BOS-100 injection impacts. Soil cores and lithologic logs shall be included and discussed in the August 2021 report to CDPHE.
8. Install and abandon boreholes in accordance with applicable Colorado laws and regulations. Please see 2 CCR 402-2, which outlines some of the Colorado Department of Water Resources’ requirements. Abandonment shall be documented and reported to CDPHE in the August 2021 report.

Based on Thornton, LLC’s experience with direct-push over the last two months, Thornton, LLC should anticipate potential direct push refusal in OFS-4, OFS-5, and OFS-6. CDPHE expects this next phase of work will begin earlier than initially anticipated to account for the possible need to “pre-drill” other off-site injection locations. Because refusal is now known to be a potential obstacle to timely completion of injections, Thornton, LLC should begin to schedule the next round of injections with subcontractors now, and allow for foreseeable weather and drilling delays to ensure work is completed in accordance with the court order’s June 1, 2021 deadline.

Per CDPHE’s June 23, 2020 approval with modifications letter, groundwater shall initially be sampled monthly. If and when monitoring wells are impacted by BOS-100, Thornton, LLC shall report it to CDPHE and request changes to monitoring. CDPHE may adjust or decrease groundwater monitoring requirements accordingly.

CDPHE reserves the right to require further corrective action and investigation. In addition, CDPHE reserves the right to determine compliance with CAP and Court Order requirements. Except for the limited approval provided here to use the “pre-drill” method in accordance with the CAP as modified by this letter, no other CAP Addendum or CAP conditions are changed or modified. Thornton, LLC must comply with all applicable laws, regulations, even if not specifically mentioned in this letter.

If Thornton, LLC has questions, please contact CDPHE. Thank you.

Sincerely,

Lindsay Masters  
Environmental Protection Specialist  
Hazardous Waste Corrective Action Unit  
Hazardous Materials and Waste Management Division



Colorado Department of Public Health and Environment

ecc: Tom Harp, R3  
Chad Howell, City of Thornton  
Tom Butts, Tri-County Health Department  
Robert Beierle, CDPHE  
Laura Dixon, CDPHE  
Emily Splitek, Colorado AGO  
HMWMD Records

