

# **Vertical Shaft Excavation to Remove Contaminated Soil with Passive Vent Tube Backfill Completion**

### INTRODUCTION

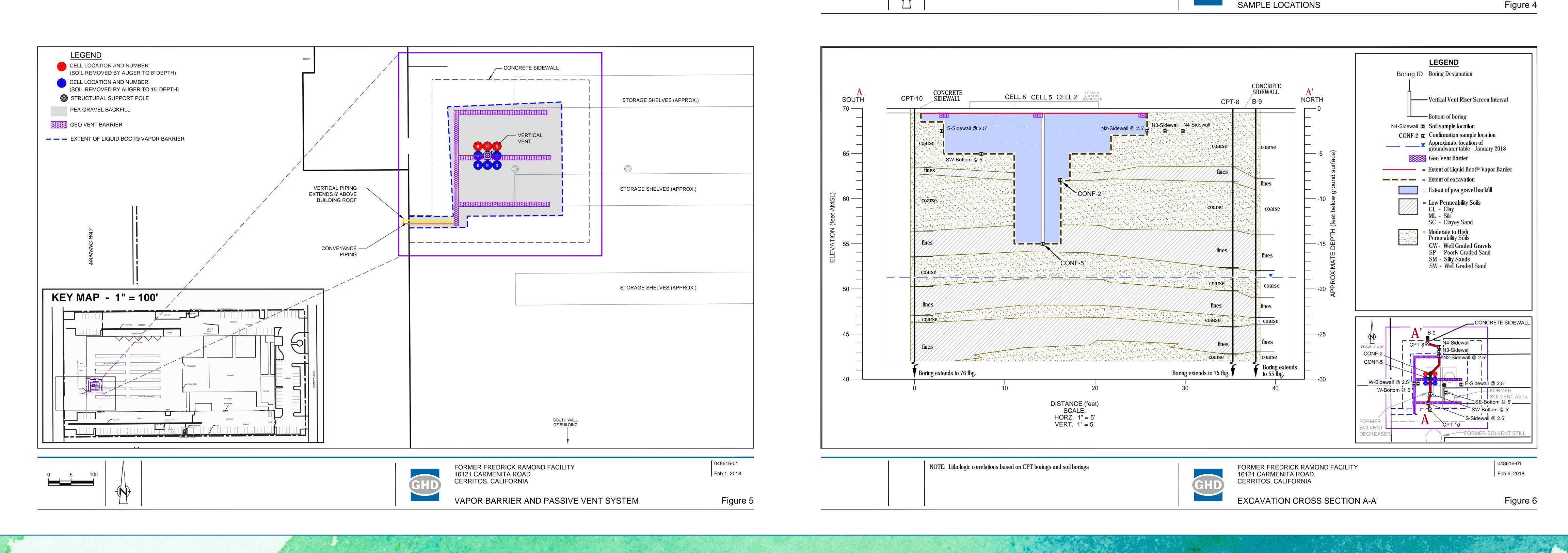
A southern California site contaminated with chlorinated volatile organic compounds (CVOCs) includes soil excavation with off-site disposal as part of the overall remedy for soil and groundwater. Contamination originated from a former solvent vapor degreasing unit used by a light manufacturing company which shut down operations in 2008, although the degreaser was taken out of service in 1999. Currently (SOIL REMOVED BY AUGER TO 8' DEPTH 
 CONF-2

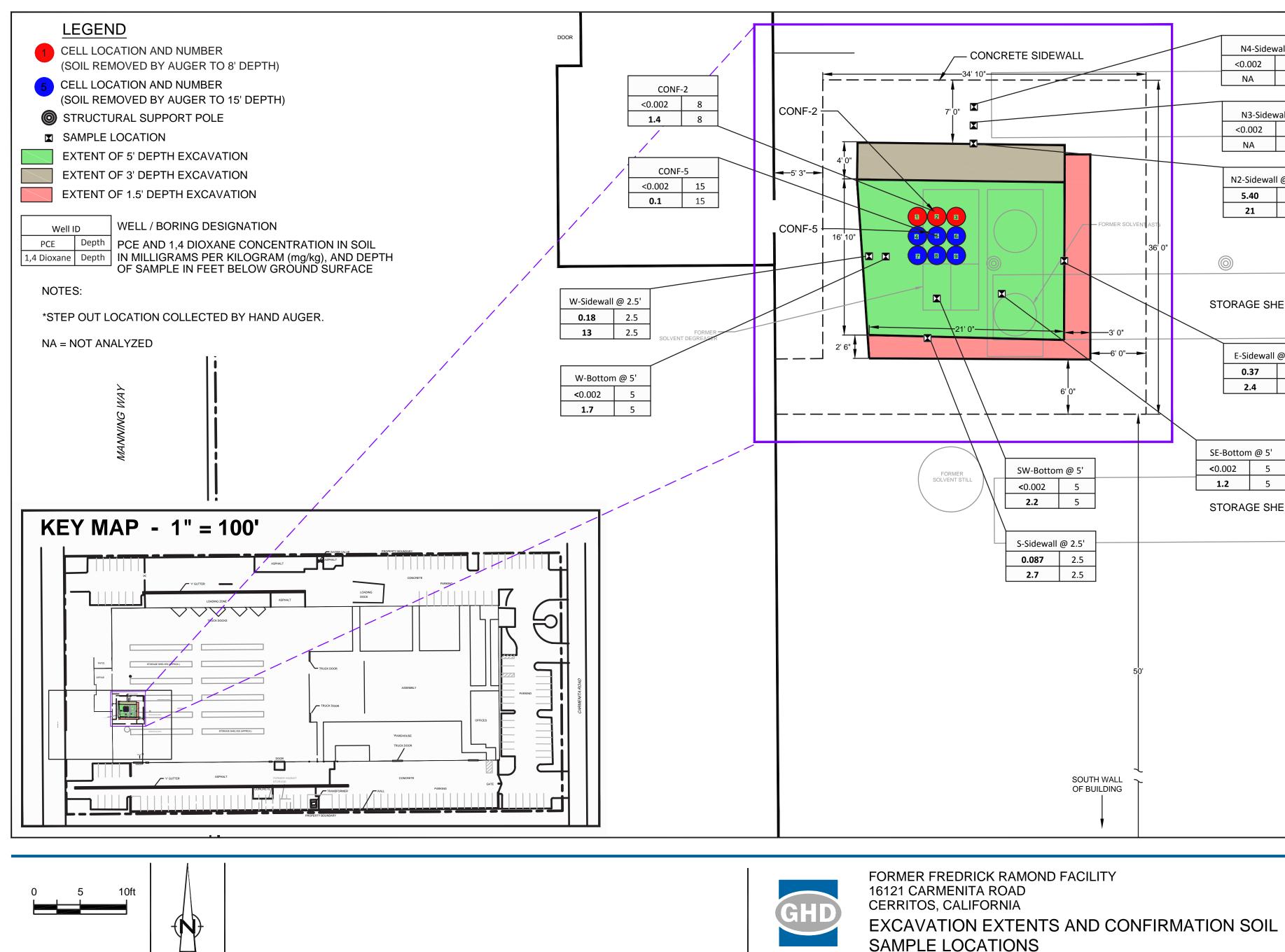
 <0.002</td>
 8

 1.4
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(SOIL REMOVED BY AUGER TO 15' DEPTH the site is used as a warehouse for storage and shipment of safety STRUCTURAL SUPPORT POL SAMPLE LOCATION EXTENT OF 5' DEPTH EXCAVATION equipment. Soil contamination extends to the top of the water EXTENT OF 3' DEPTH EXCAVATIO ENT OF 1.5' DEPTH EXCAVAT table, which occurs at approximately 15 feet below ground surface (bgs). Although the soil contamination is fairly tightly contained in a 0.182.5132.5 NA = NOT ANALYZED 9 ft by 9 ft area, Class C soil at the site would require a much larger 
 W-Bottom @ 5'

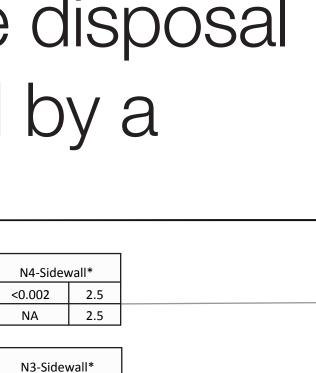
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excavation to provide stability down to 15 ft bgs. Accordingly, an approach was developed to remove soils through excavation in an **KEY MAP** - 1" = 100' area that's approximately 19 by 20 ft to 5 ft bgs, and then extend the 0.0872.52.72.5 excavation down to 15 ft bgs with auger tubes, to remove soil in a 9 ft by 9 ft area. Upon completion, passive soil venting was required due to the presence of CVOCs in groundwater and daily occupancy of the building. Accordingly, an innovative approach was designed to provide vertical venting tubes for site soils. ORMER FREDRICK RAMOND FACILI 16121 CARMENITA ROAD 0 5 10ft CERRITOS, CALIFORNIA 





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N2-Si	dewall	@ 2.5'				
5.4		2.5				
2:	1	2.5				
2						
9						
ORAG	SE SHE	LVES	(APPRC	X.)		
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0.3 2.		2.5				
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Bottom	@ 5'					
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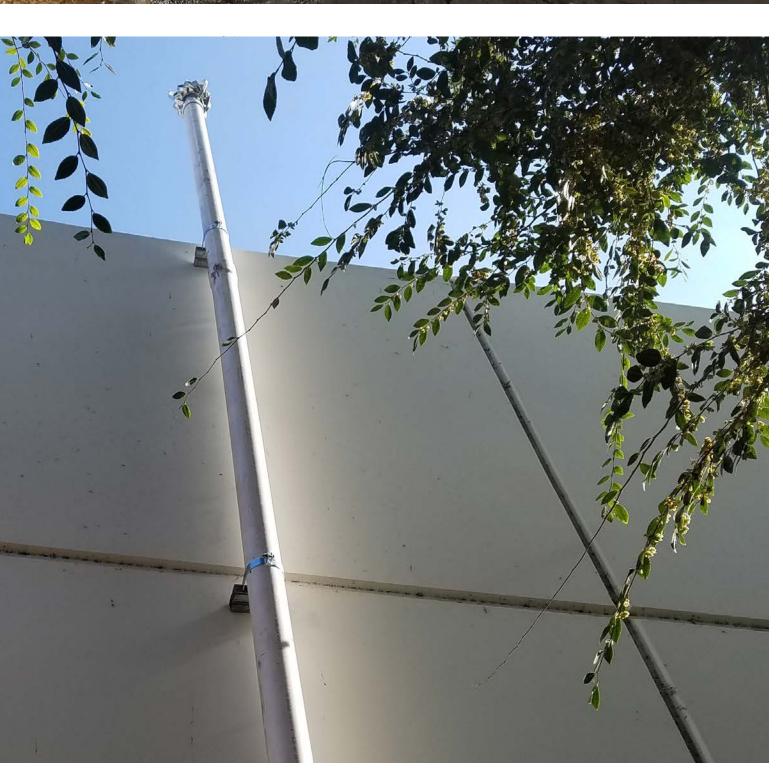
## SITE PHOTOS

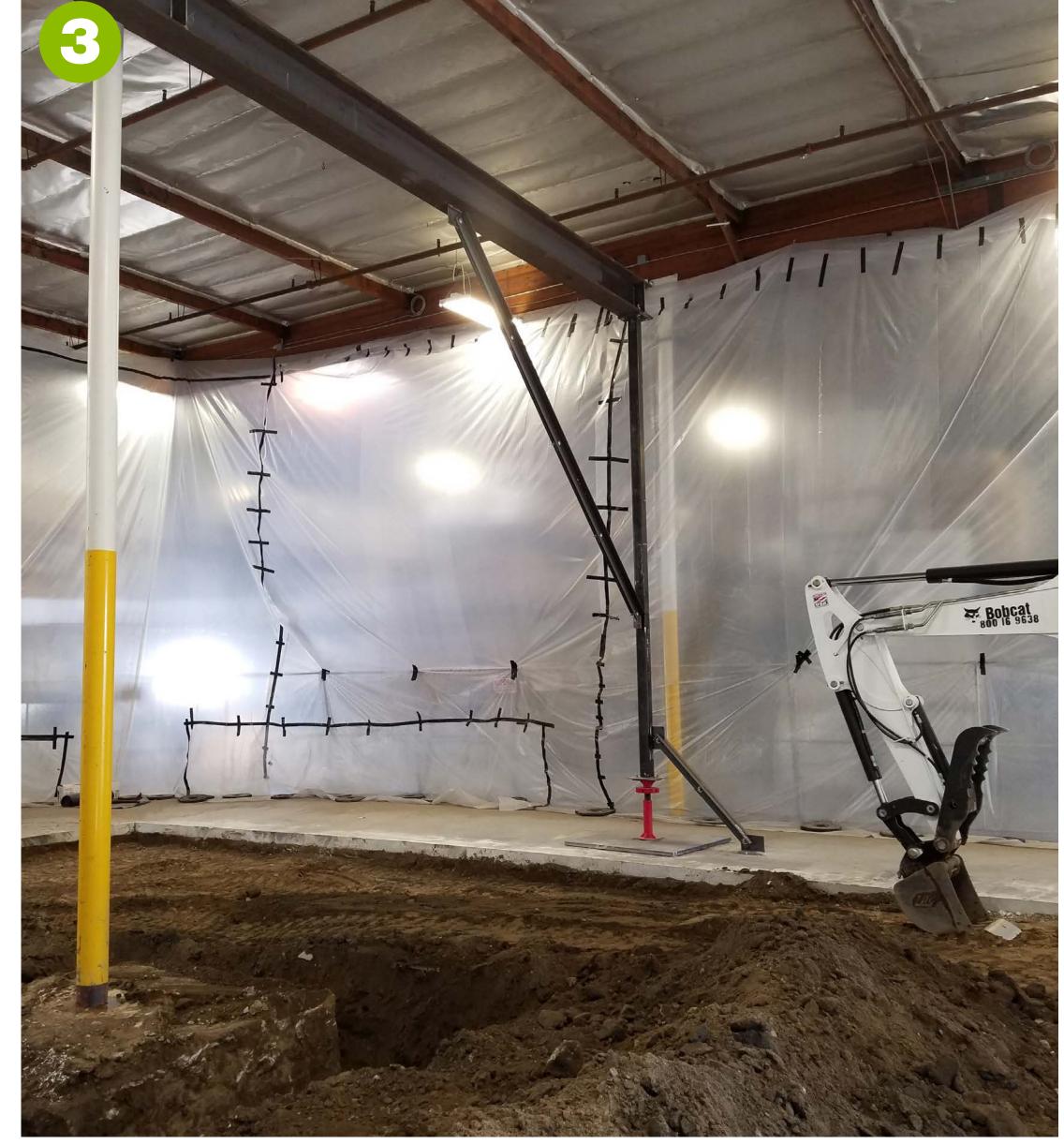
Construction successfully completed in November 2017. Backfill with pea gravel and emplacement of venting tubes provide preferential pathway for vapor collection and venting outside building, which provides a very protective, reliable and maintenance free system for soil vapors.















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