BEFORE THE HEARING BOARD OF THE

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

In The Matter Of SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, Petitioner, vs. CHIQUITA CANYON, LLC a Delaware Corporation, [Facility ID No. 119219] Respondent.	**Case No. 6177-4** **DECLARATION OF ROBERT E. DICK, P.E., B.C.E.E.** District Rule 402 and Health and Safety Code § 41700_____ Hearing Date: December 12, 2023 Time: 9:30 am Place: Hearing Board South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 91765

I, Robert E. Dick, declare as follows:

1. I am of sufficient age and am competent to testify in this proceeding. I make this declaration based upon personal knowledge and am competent to testify to the facts set forth herein.

Background and Credentials

2. I am a licensed professional engineer with over 30 years' experience on civil and environmental engineering projects related to solid waste management. I have performed landfill, landfill gas, and leachate engineering projects (design, permitting, construction, and operations) in more than 15 states and several foreign countries. I have performed over 150 landfill gas projects involving landfill gas migration control, odor control, emissions control, Clean Air Act compliance, and energy recovery/utilization. I have performed over 100 landfill projects involving new cell bottom liner systems, final capping and closure, leachate management and treatment, stormwater management, fill sequence and operational planning, airspace analyses, groundwater monitoring,

remedial measures and corrective actions. My work focuses largely on municipal solid waste ("MSW") landfills like the Chiquita Canyon Landfill (the "Landfill").

3. I have worked with SCS Engineers, Inc. ("SCS") for approximately 33 years. I am currently the Senior Vice President and Business Unit Director of SCS' Mid-Atlantic operations. I am a licensed professional engineer in Virginia (License No. 024815) and North Carolina (License No. 022790).

4. In the last 8 years, I have researched and advised landfills regarding conditions that engineers and the industry have termed Elevated Temperature Landfills ("ETLFs"). These are landfills experiencing elevated temperature and other conditions that are rare but increasing in frequency across the industry. Of the hundreds of municipal solid waste landfills in North America, there are approximately 10 to 15 landfills with the majority of their waste mass that can be characterized as an ETLF. There are also approximately 40 or so other landfills that have a relatively limited portion of their waste mass exhibiting ETLF conditions. Collectively, I have advised seven landfills that exhibited a multitude of various ETLF conditions, including discharges of pressurized leachate from boreholes and well piping due to substantial subsurface pressures, on the implementation of best management practices to manage the reaction conditions as well as mitigate community impacts, such as odors. Two of these landfills had the majority of their waste mass characterized as an ETLF and implemented extensive corrective actions and remedial measures. The corrective measures that I have helped to design and implement were effective in both addressing the underlying reaction and resultant odors.

5. I have authored several publications and made numerous presentations on air quality, solid waste management, landfill engineering and landfill gas management/control, leachate management and treatment, landfill gas wellfield dewatering design/operations, elevated temperature landfills, landfill management strategies, greenhouse gas emissions, composting, and regulatory compliance. I serve as a Virginia Department of Professional and Occupational Regulation Waste Management Facility Operators Board-approved training course instructor for solid waste management facility operators' license examinations, which addresses topics related to landfills, leachate, landfill gas, and other aspects of solid waste management.

6. My experience working with landfills and ETLFs has provided me with the skills, knowledge, and judgment to identify conditions related to an ETLF, and advise on the best management practices suited to mitigate these conditions.

7. I have been involved in providing technical support and engineering expertise in regulatory agency consent order negotiations for multiple landfills and have been hired as an expert witness or provided testimony as a subject matter expert before legislative bodies and regulatory agencies as well as in civil cases, over fifteen times.

Experience Working with Chiquita Canyon Landfill

8. SCS works on the permitting, engineering design, construction, as well as operations and maintenance ("O&M") and other improvements related to the Landfill's landfill gas collection and control system, the landfill gas wellfield dewatering system, as well as the Landfill's leachate and condensate management and storage system, and has done so for many years. In early 2023, my colleagues at SCS sought my expertise on ETLFs because the Landfill was showing signs consistent with ETLF conditions.

9. I assisted with a root cause analysis to identify the source of excess emissions of total reduced sulfur and sulfur oxides under the Landfill's Title V permit. I reviewed data related to the landfill gas system, including well-field monitoring data, laboratory analytical data, landfill gas system drawings, and site photos and videos. My assessment of the data was that a portion of the Landfill was exhibiting the typical symptoms of an ETLF and that an ETLF event was occurring. This root cause analysis – consisting of a 4-page report with 170 pages of data – was submitted to the South Coast Air Quality Management District on February 22, 2023.

10. I was retained by Chiquita Canyon, LLC ("Chiquita") to provide expert consulting services related to managing the ETLF conditions and its resulting impacts, including odors and liquids.

11. I serve on the DMS Committee as the subject matter expert for chemical reaction(s) within landfills, which can result in atypical landfill conditions, such as heat accumulation, certain changes in landfill gas and leachate composition, distinct odors, accelerated settlement, formation of significant subsurface pressures, and elevated levels of dimethyl sulfide and non-methane

organic compounds. I, along with colleagues at SCS, also serve on the DMS Committee as the subject matter experts for landfill gas collection/extraction systems, landfill gas condensate/leachate management systems, and landfill gas control.

12. This declaration is made for the December 12, 2023 hearing on the Stipulated Order for Abatement adopted on September 6, 2023.

Leachate Issues and Discharges of Pressurized Leachate

13. Based on my knowledge of ETLF conditions and ETLF landfills, the significant increase in the production of liquids within the Landfill waste mass, along with the increase in subsurface pressures, that in tandem are the cause of the recent leachate seeps and discharges of pressurized leachate, is due to the ETLF conditions the Landfill is experiencing in the Reaction Area. The manifestation of increased liquid quantities is likely attributed to multiple circumstances, including: 1) a reduction in field capacity of the waste materials (which diminishes the moisture attenuation abilities), 2) certain synthesis reactions may be occurring to produce water, especially considering the availability of hydrogen, and 3) the heat present may facilitate pyrolytic reactions that produce condensable liquids. The increased pressure that develops because of the increased temperatures within the waste mass causes the movement of liquids within the void spaces such that leachate seeps and discharges of pressurized leachate may occur.

14. Leachate seeps occur when liquid within the landfill waste mass encounters a layer of low permeability material, flows along the top of that layer, or is encouraged to move toward the landfill surface by subsurface pressures and/or gas migration within the void spaces, and emerges from the landfill surface, most often on sideslope areas.

15. There are many circumstances under which a discharge of pressurized leachate may occur. However, they primarily occur in two contexts: (1) while drilling the borehole for a new or replacement vertical landfill gas extraction well and (2) while installing a dewatering pump in a landfill gas well.

16. When drilling a landfill gas well, a discharge of pressurized leachate may occur if the drilling activities encounter a high-pressure zone within the landfill waste mass. Liquids present within the landfill will move along the path of least resistance, so when drilling activities penetrate

into a high-pressure zone, the pressurized liquids will discharge upward through the borehole. In certain instances, the subsurface pressures may be sufficient to force the liquids above the landfill surface elevation and into the atmosphere.

17. Similarly, if a constructed landfill gas well is experiencing high positive pressure conditions, leachate may discharge upward within the well riser pipe, again following the path of least resistance. When the wellhead is secured, this leachate discharges through the wellhead and into the landfill gas collection piping, keeping the leachate contained within the landfill gas system's condensate management system. When the wellhead is not secured to the top of the well riser pipe, for example, while installing a pump in the well, this pressurized leachate may discharge upwards into the air. This condition (when the piezometric head exceeds the top of well pipe elevation) is referred to as artesian conditions, and is evident because liquid is discharged above the surface of the landfill.

18. Based on my experience with ETLF landfills, discharges of pressurized leachate are common in landfills experiencing ETLF events, but they are uncommon in landfills not experiencing ETLF events. Prior to the start of the ETLF conditions at the Chiquita Canyon Landfill, the Landfill had not experienced any such discharges of pressurized leachate.

19. Since the ETLF event at the Landfill began, on August 4, September 18, September 26, and October 4, 2023, the Landfill observed discharges of pressurized leachate while drilling four new or replacement wells (one on each day) in the area affected by the ETLF conditions. Each of the discharge events were around an hour in duration and of fairly similar intensity, with one anomaly.

20. Since the ETLF event at the Landfill began, the Landfill observed discharges of pressurized leachate at nine wells in the area affected by the ETLF conditions when conducting pump installation or replacement, or well maintenance activities that involved removing a wellhead. Assuming that the static liquid level within the well coincided with the uppermost section of perforated pipe (i.e., well fully blocked by liquid), each of these discharge events would have required the well to be experiencing at least 15 pounds per square inch of positive pressure in order to discharge the liquid from the top of well riser pipe.

21. Exhibit A is a true and correct copy of a map showing the location of each well that has experienced a discharge of pressurized leachate, whether while drilling a borehole for the well or conducting pump installation or replacement, or well maintenance activities.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to my personal knowledge.

Executed on this 1st day of December, 2023, in Powhatan, Virginia.

Robert E. Dick
Senior Vice President
SCS Engineers

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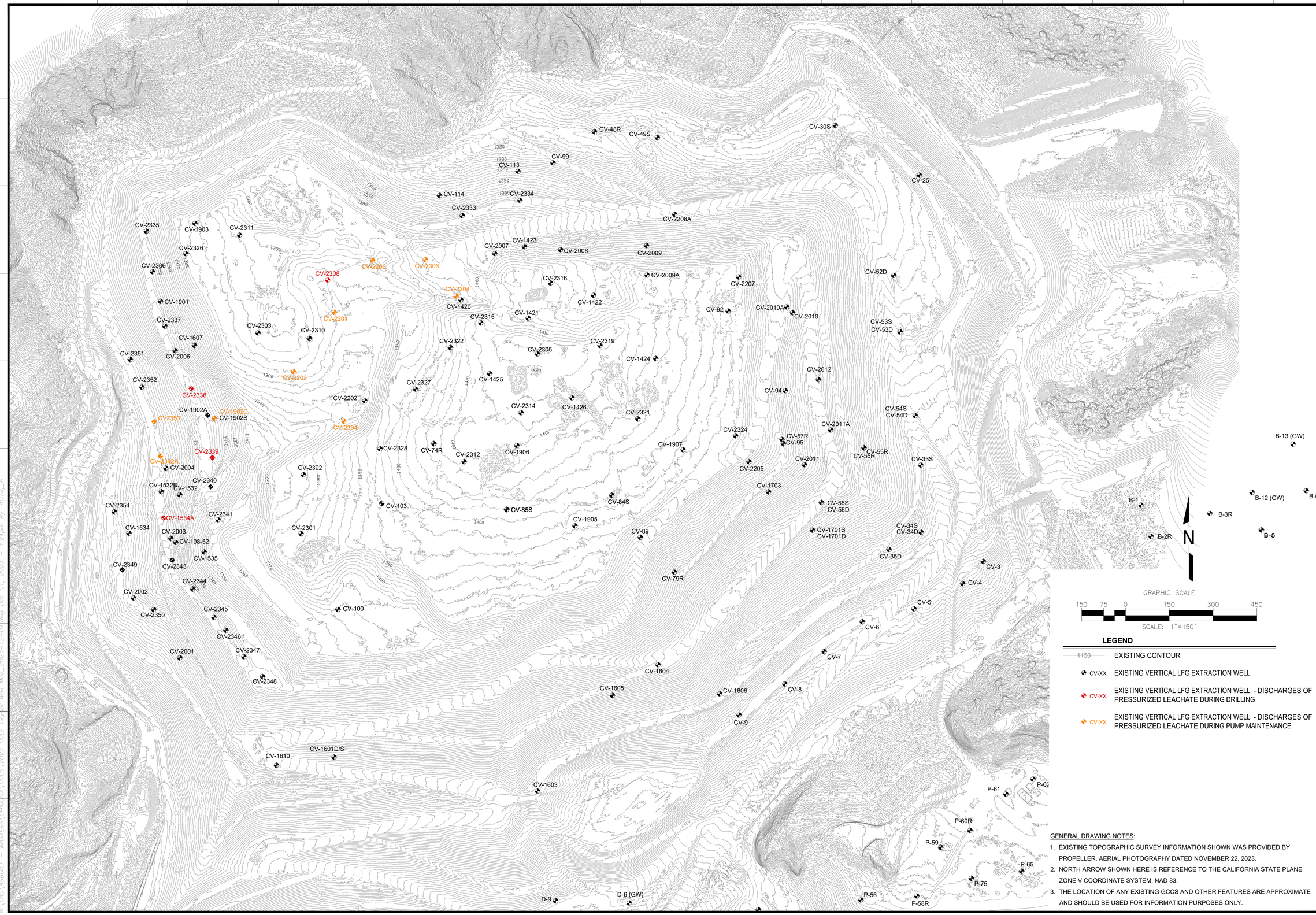
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

In The Matter Of SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, Petitioner, vs. CHIQUITA CANYON, LLC a Delaware Corporation, [Facility ID No. 119219] Respondent.	**Case No. 6177-4** **EXHIBIT A TO DECLARATION OF ROBERT E. DICK, P.E., B.C.E.E.: MAP OF WELL DISCHARGE LOCATIONS** District Rule 402 and Health and Safety Code § 41700_____ Hearing Date: December 12, 2023 Time: 9:30 am Place: Hearing Board South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 91765



LEGEND

1150	EXISTING CONTOUR
CV-XX	EXISTING VERTICAL LFG EXTRACTION WELL
CV-XX	EXISTING VERTICAL LFG EXTRACTION WELL - DISCHARGES OF PRESSURIZED LEACHATE DURING DRILLING
CV-XX	EXISTING VERTICAL LFG EXTRACTION WELL - DISCHARGES OF PRESSURIZED LEACHATE DURING PUMP MAINTENANCE

GENERAL DRAWING NOTES:

1. EXISTING TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS PROVIDED BY PROPELLER. AERIAL PHOTOGRAPHY DATED NOVEMBER 22, 2023.
2. NORTH ARROW SHOWN HERE IS REFERENCE TO THE CALIFORNIA STATE PLANE ZONE V COORDINATE SYSTEM, NAD 83.
3. THE LOCATION OF ANY EXISTING GCCS AND OTHER FEATURES ARE APPROXIMATE AND SHOULD BE USED FOR INFORMATION PURPOSES ONLY.

NO. | REVISION | DATE

SHEET TITLE: EXISTING VERTICAL LFG EXTRACTION WELL MAP

PROJECT TITLE: CHIQUITA LANDFILL CASTAIC, CALIFORNIA

CLIENT: CHIQUITA CANYON LANDFILL CASTAIC, CALIFORNIA

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PROJ. NO: 07214017.93 | DSN. BY: - | DWN. BY: SRM | CHK. BY: - | APP. BY: - | ACAD FILE: ENGINEERS

DATE: 12/01/2023

SCALE: AS SHOWN

SHEET: 1