INFORMATION SHEET

ORDER NO. R5-2015-
SHASTA COUNTY AND CITY OF REDDING
WEST CENTRAL CLASS III MUNICIPAL SOLID WASTE LANDFILL
SHASTA COUNTY

Shasta County owns the West Central Class III Municipal Solid Waste Landfill (West Central Landfill). The City of Redding conducts day-to-day operations of the landfill under an Agreement executed between the City and the County. Shasta County and the City of Redding are collectively referred to as Discharger. West Central Landfill is located approximately 12 miles southwest of Redding near the community of Igo at 14095 Clear Creek Road. Landfill operations began in 1982.

West Central Landfill is located near the western edge of the northern Sacramento Valley in a location where the land changes from relatively flat east of the landfill to hilly ground west of the landfill. Topography at the site ranges from 850 to 1,100 feet above mean sea level (MSL). Geologic units mapped at the surface of the site and surrounding area include, from youngest to oldest, recent alluvium and dredge tailings, the Pleistocene-aged Red Bluff Formation, and the Pliocene-aged Tehama Formation. The Cretaceous-aged Chico Formation occurs at depth beneath the site, and outcrops within a mile west of the landfill. Older granitics, meta-volcanics (Copley greenstone), and meta-sediments outcrop in the Klamath Mountain Geologic Province northwest of the landfill.

West Central Landfill is situated in the southwestern part of the Redding Groundwater Basin, a sub-basin of the Sacramento Valley Groundwater Basin. The geologic units found in the Redding Groundwater Basin include recent alluvium and dredge tailings at the surface, the Red Bluff Formation, the Tehama Formation, and at depth, the Chico Formation. The Chico Formation produces saline water in most areas of the Redding Groundwater Basin. The saline water is a relic of the marine environment in which the unit was deposited. The Red Bluff Formation and the Tehama Formation have similar water-bearing characteristics, and for these WDRs, are treated as a single hydrogeologic unit, referred to as the Red Bluff-Tehama Group.

The facility receives an average of 39 inches of precipitation per year (measured at Redding Fire Station No. 2) as provided by the California Department of Water Resources *Rainfall Analysis for Drainage Design, Volume II, Long Duration Precipitation Frequency Data, Bulletin* 195, October 1976. Nearly all precipitation occurs as rainfall during the wet weather season (November through March). The average unadjusted evaporation rate at the site is approximately 79 inches per year as provided by the California Department of Water Resources *Evaporation from Water Surfaces in California, Bulletin 73*-70, November 1979. Applying a 0.7 pan evaporation coefficient yields an applied evaporation rate of 55 inches per year.

The 100-year, 24-hour precipitation event for the facility is estimated to be 7.91 inches, based on National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates, as interpolated for the site. The 1,000-year, 24-hour precipitation event for the facility is estimated to be 10.2 inches, based on National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Point Precipitation Frequency Estimates, as interpolated for the site. The waste management facility is not within a 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 0600570350B.

The West Central Landfill property covers 1,250 acres of land. Three classified waste management units (Units) exist at the site; the 22-acre Phase 1 Unit which closed in 1992, the currently operating Phase 2 Unit which began operations in 1991, and a covered 450,000 gallon (total capacity without freeboard) Class II surface impoundment for storage and evaporation of leachate (Unit 3). The Phase 2 Unit is being constructed in sub-Units and will cover 100 acres at full build-out. Presently, approximately 72 acres of the Phase 2 Unit has been constructed and contains waste. The estimated remaining site life for the Phase 2 Unit is 20 years, with an estimated final closure date on 2034. However, the estimated life expectancy of the Phase 2 Unit may increase as recycling and other diversion programs reduce incoming wastes. The Discharger is required to construct additional leachate storage facilities, such as a new Class II surface impoundment, by November 2015.

The Phase 1 and the Phase 2 Units both have underdrain systems installed beneath the Units to intercept high groundwater and maintain five feet of separation between the groundwater and overlying wastes. The Phase 1 Unit has a six inch perforated PVC pipe surrounded by drain rock and non-woven filter fabric buried five feet below the base liner system running the length of the Unit. In 2013, volatile organic compounds (VOCs) and other elevated water quality parameters were detected in the discharge from the underdrain system. In 2014, the Phase 1 Underdrain System was connected to the Phase 1 Underdrain Wet Well, which pumps collected liquids to the Leachate Wet Well and ultimately the Class II surface impoundment. The Phase 2 Unit has two separate underdrain systems constructed similarly to the Phase 1 Underdrain; the Unit 1-2 Underdrain running east to west five feet beneath sub-Units 1A and 2, and the Unit 3-4 Underdrain also running east to west five feet beneath sub-Units 2-3 and 2-4A. In 2002, VOCs and other elevated water quality parameters were detected in the discharge from the Unit 1-2 Underdrain, and it was permanently connected to the Leachate Main Line. Flow from the Unit 1-2 Underdrain is limited and sporadic. The Unit 3-4 Underdrain has had no recorded discharge since its installation.

Associated facilities at the site include an in-fill gas collection and control system with flare, an unclassified unlined waste tire Unit that's no longer active and has a soil final cover in place, a clean wood diversion area, an inert material diversion area, two scales, a scale house, a public drop-off and recycling area, a shop building, four contact water impoundments, six storm water detention ponds, and two storm water retention ponds. A paved road exists from the front entrance, past the scale house and public drop-off area, leading to the shop building and around the north, west, and south perimeter of the Phase 2 Unit.

The first encountered groundwater ranges from about 80 feet below ridge tops to three feet below the native ground surface in the canyon bottoms. Artesian groundwater conditions have been observed in the canyon hydraulically downgradient of the landfill Units. Groundwater elevations range from about 990 feet MSL hydraulically upgradient of the Units to about 917 feet MSL hydraulically downgradient of the Units. The direction of groundwater flow is generally toward the east and southeast of the landfill. The estimated average groundwater velocity is 30 feet per year.

The current groundwater monitoring network for the landfill consists of 10 monitoring wells installed in various locations around the Phase 1 and Phase 2 Units. Wells MW-12 and MW-19 are background monitoring wells located on the west side of the Phase 2 Unit, wells MW-2, MW-6A, MW-6B, MW-9, MW-10, and MW-20 are compliance wells located hydraulically downgradient of the Units, and wells MW-17 and MW-18 are crossgradient of the Phase 2 Unit on the south and north sides. There are no unsaturated zone monitoring devices at the landfill. Unsaturated zone monitoring beneath the Phase 1 and Phase 2 Units was deemed impractical due to the presence of high groundwater elevations beneath the Units. Future Class II surface impoundments will be required to install pan lysimeters or other type of unsaturated zone monitoring devices beneath the lowest part of the Unit to provide for the earliest possible detection of a release from the Unit.

Groundwater impacts have been observed in site monitoring wells hydraulically upgradient and hydraulically downgradient of the Units. VOC impacts observed upgradient of the Unit are related to landfill gas migration. VOC and other elevated water quality parameters observed downgradient of the Units are thought to be caused by landfill gas migration and leachate releases.

Corrective actions proposed by the Discharger include gas extraction and partial final closure of the Phase 2 Unit. Vertical in-fill gas extraction wells have already been installed in the Phase 1 Unit and the western portion of the Phase 2 Unit. In 2014, 18 additional vertical extraction wells were installed in the Phase 2 Unit to increase well density within the existing well field near impacted upgradient groundwater monitoring wells and to expand the gas extraction area further east into uncontrolled portions of the Unit and more recently placed wastes. Partial final closure of the western portion of the Phase 2 Unit is scheduled for 2018. The Discharger anticipates completing additional partial final closure projects approximately every five years thereafter, until the Phase 2 Unit is fully capped and closed in 2032. Partial final closure dates after the first phase of closure in 2018 are only estimates that will be affected by additional diversion and recycling efforts and volumes of waste received for disposal.

The Waste Discharge Requirements for West Central Landfill are being revised to require corrective action measures proposed by the Discharger. This Order requires the Discharger to complete partial final closure of the western portion of the Phase 2 Unit by 1 November 2018. If the infill gas extraction system does not adequately reduce VOC impacts in groundwater monitoring wells or limit gas migration beyond the Unit, then perimeter gas extraction may be

necessary. This Order also requires the Discharger to perform a one-time analysis of landfill gas for VOCs from perimeter gas monitoring wells, provide an updated Water Quality Protection Standard Report, provide a Sample Collection and Analysis Plan, perform an iso-settlement survey of the closed Phase 1 Unit, and to construct additional leachate storage facilities by 1 November 2015.