



THE CITY OF SAN DIEGO
REPORT TO THE CITY COUNCIL

DATE ISSUED: January 19, 2010 REPORT NO. 10-005
ATTENTION: Natural Resources and Culture Committee
Agenda of January 27, 2010
SUBJECT: Maintenance and Monitoring of City Landfills

SUMMARY:

THIS IS AN INFORMATION ITEM ONLY. NO ACTION IS REQUIRED ON THE PART OF THE NR&C COMMITTEE.

BACKGROUND:

While the City has been hauling trash since 1919, it has only been disposing of waste in City run landfills since 1951. As a result of the City's operation of waste disposal sites, the City now has the responsibility to maintain not only its active landfill, but eight closed landfills and eight burn ash dumps throughout the City (see Appendix 1 for a map of sites). Regulations regarding both active and closed landfills have become increasingly stricter as possible threats to public health and the environment from such facilities have been recognized. Landfill liners were not required by regulations until 1991, so the City's closed landfills and burn dumps are all unlined facilities.

Within the City of San Diego, Environmental Services Department (ESD) is tasked with maintaining the City's landfills and burn dump sites in regulatory compliance (see Appendix 2 for a list of laws and regulations related to landfilling and closed site management and Appendix 3 for a short list of definitions of terms for solid waste sites). The Landfill Maintenance and Monitoring (LM&M) function within the Waste Reduction and Disposal Division (WRAD) of ESD provides this service through landfill gas and groundwater monitoring, CIP oversight, native plant revegetation, and contract management.

DISCUSSION:

The closed sites are geographically spread throughout the City. The City has an obligation to monitor and maintain closed landfills for a minimum of 30 years under regulatory requirements until the site has stabilized and no longer presents potential risks to the environment. There are pending regulation changes that propose to extend these responsibilities even longer. Due to the lack of moisture in the buried waste, decomposition is much slower in San Diego resulting in landfill maintenance and monitoring requirements extending 50 years or longer.

The three agencies that are primarily involved in landfill regulatory compliance at our sites are the California Integrated Waste Management Board through their Local Enforcement Agency

(LEA), the County's Air Pollution Control District (APCD) and the State Water Resources Control Board through the San Diego Regional Water Quality Control Board (RWQCB). Other agencies responsible for other environmental compliance issues include: U. S. Fish & Wildlife Service; California Department Fish & Game; and the U.S. Army Corps of Engineers.

The LEA enforces Title 27 of the California Code of Regulations and performs quarterly inspections of our sites. They look for landfill cover infractions mainly caused by erosion or settlement, elevated methane gas readings on the landfill surface or in monitoring probes buried at selected varying depths around the perimeter of the landfill and general housekeeping and maintenance of the sites. They note Areas of Concern or may issue Notices of Violation for any non-compliance concerns. They also monitor all post closure land uses within 1,000 feet of the disposal area, mainly for methane gas issues.

The APCD administers permits for landfill gas (LFG) migration control systems and periodically inspects for elevated methane readings on the landfill surface and from LFG collection apparatus. They may issue Notices to Comply or Notices of Violation during their inspections for violations of permit conditions. A LFG collection system consists of a series of drilled extraction wells, collection piping connecting the wells throughout the site, and a flare station where the collected LFG is ignited and burned. Due to the dynamic nature and unpredictable settlement experienced at landfills, maintenance and adjustment of these collection systems is constant and on-going. Studies overseen by ESD's Energy, Sustainability, and Environmental Protection Division are being conducted to establish the feasibility of beneficial use of the collected landfill gases (for example, electricity generation) at some sites. Currently, electricity generated from the utilization of LFG gas is used to power operational facilities at the Miramar Landfill.

The RWQCB issues waste discharge requirements (WDR's) for all closed landfill sites because of the adverse environmental potential of leachate and LFG to degrade the waters of California. WDR's, among other maintenance obligations, outline groundwater monitoring requirements. Groundwater monitoring networks are in place at most sites with twice yearly sampling and reporting required. Inspectors from this agency look for compliance with the WDR's and may issue Notices to Cease and Desist if they discover unacceptable site conditions. The RWQCB and the landfill sites are required to maintain industrial storm water National Pollutant Discharge Elimination System (NPDES) permits. These storm water permits are in addition to Citywide NPDES requirements and require the implementation of best technology economically available, storm water monitoring and annual reporting to the RWQCB (a list of the number of LFG devices, groundwater wells and NPDES test locations is included for reference in Appendix 4).

Landfill Uses

To some people, the closed landfill sites appear to be large, underutilized pieces of property. But three major problems of landfill decomposition are the creation of methane gas, the production of leachate (liquid that percolates through the trash) and excessive differential settlement. As such, all post closure landfill use activities must be in compliance with regulatory requirements and be designed to:

- 1) protect public health and safety and prevent damage to structures, roads, utilities and gas/groundwater monitoring control systems;

- 2) prevent public contact with waste, landfill gas and leachate; and
- 3) prevent landfill gas explosions.

Development of these sites is severely limited by these restrictions and the high cost of engineered alternatives keeps many would-be developers away. It is likely that any proposed project that alters the cover system of a closed landfill would prompt the RWQCB to request an additional study to determine potential impacts and require applicable mitigation measures (for example, expensive impermeable covers).

To complicate matters further, many of the landfill sites are on dedicated/designated parkland so all land uses need to be approved by the City's Park and Recreation (P&R) Department to ensure compliance with the policies and procedures. A lease or Right of Entry (ROE) permit, administered by the City's Real Estate Assets Department (READ) is also typically required for any proposed use of the sites, and normal permitting requirements administered by Development Services Department (DSD) also need to be adhered to.

Background of Sites

Arizona Street Landfill (ASL): Located in Council District 3 in the East Mesa area of Balboa Park. The landfill began receiving waste in August of 1952 for the purpose of filling a finger of Florida Canyon with the intention of relocating the 18-hole Balboa Golf Course in order to accommodate construction of Switzer Canyon Freeway. The freeway plan was later abandoned and the landfill stopped receiving refuse in December of 1974. The site received approximately 1.9 million tons of refuse and occupies approximately 66 acres.

The site is maintained as open space. Grades, pipes, berms and storm water collection appurtenances are maintained to promote positive drainage. Mulch from the Miramar Greenery operation is applied to slopes and top decks to prevent erosion and slow the proliferation of weeds. On the northern portion of the site, a parking lot, curb and gutter, street lights, and a fish casting pond had to be demolished due to regulatory compliance issues caused by differential settlement. The slopes of the landfill fronting Florida Canyon have been planted with native species. Development of the ASL site is dictated by the East Mesa Precise Plan and P&R has recently hired a consultant to evaluate the best alternative for multi-use fields on the site. A P&R equipment yard is currently in the middle of the site.

LM&M also maintains a LFG collection system and ensures it is operated in full compliance with APCD requirements. The original collection system of 23 extraction wells and flare was installed in 1991 and has been upgraded numerous times to its present size of 73 extraction wells and a larger flare system. Eight offsite gas probes are monitored on a quarterly basis and reported quarterly to the LEA. A groundwater monitoring network consisting of six groundwater wells is monitored twice yearly with twice yearly reporting to the RWQCB. Issues at the site include: P&R operational facilities located on top of the landfill prevent proper grading; a large storm drain that runs under the landfill; and evidence of offsite landfill gas migration in both groundwater and gas probes.

26th Street Baled Refuse Site: Located in Council District 3 in the Southeast corner of Balboa Park. The site partially fills a small canyon west of Golf Course drive and east of 26th Street. The site was operated from April 1971 through August 1973 as a pilot project to determine the

feasibility of using City owned canyons for the disposal of baled municipal household waste. The project was cancelled before the canyon was filled which would have served as extension to the existing golf course parking lot. The site received approximately 17,000 tons of refuse and occupies approximately 0.8 acres.

The site is maintained by LM&M as open space. Grades, pipes, berms and storm water collection appurtenances are maintained to promote positive drainage. Mulch from the Miramar Greenery operation is applied to the landfill surface to prevent erosion and slow the proliferation of weeds. Because of the small amount of refuse buried at this site, neither a groundwater monitoring nor landfill gas collection system is required by regulations to be installed. Periodic maintenance of the drainage system and clearing of homeless camps are the only issues at this site.

South Chollas Landfill (SCL): Located in Council district 4 in the Oak Park Community between the Martin Luther King, Jr. Freeway (SR-94) and College Grove Drive. It is designated as parkland and Water Utilities owns a portion of the property from before it was landfilled. The landfill began receiving waste in October of 1951 until landfill operations ceased in September of 1981. The site received approximately 4.75 million tons of refuse and occupies approximately 170 acres.

The site is maintained as open space. Grades, pipes, berms and storm water collection appurtenances are maintained to promote positive drainage. Mulch from the Miramar Greenery operation is applied to slopes and top decks to prevent erosion and slow the proliferation of weeds. In 2007 a slope enhancement project was completed to stabilize the south facing slopes along SR-94 and provide adequate cover. The Chollas Operation Yard is located immediately adjacent to and on the SCL site. A model airplane flyers club has an airfield and utilizes a portion of the site through a ROE permit with READ.

LM&M maintains a LFG collection system and ensures it is operated in full compliance with APCD requirements. An initial collection system of 18 extraction wells and flare was installed in 1987 at the West end of the site and has been upgraded numerous times to its present size of 130 extraction wells and an additional second flare. Fifty six offsite gas probes are monitored on a quarterly basis and reported quarterly to the LEA. A groundwater monitoring network consisting of seven groundwater wells is monitored twice yearly with twice yearly reporting to the RWQCB. Issues at the site include: the Chollas operational yard located on top of the landfill; the close proximity of residences and a school; and evidence of offsite landfill gas migration in both groundwater and gas probes.

Paradise Hills Park Landfill (PHPL): Located in Council District 4 about 7 miles southeast of downtown San Diego. It is bounded by Paradise Hills Community Park to the south and Paradise Valley Road to the north. An agreement between the County of San Diego and P&R allowed the County to landfill a north trending canyon to provide additional flat land for P&R facilities. Landfilling began in 1966 and continued until June 1967. The site received approximately 80,000 tons of refuse and occupies approximately 5.6 acres.

Park facilities were developed on top of the landfill as intended in 1970, but by the 1980's differential settlement of the landfill had rendered most of park facilities increasingly unsafe for public use. By the mid 1990's, increased scrutiny from regulatory agencies led LM&M staff to

step in and bring the landfill site into compliance. The park improvements were demolished, additional cover was placed over the trash to meet regulations and the entire site was mulched to prevent erosion and slow the proliferation of weeds. Drainage improvements were also installed to stabilize the slope and cover refuse exposed from erosion. LM&M continues to maintain the site as open space with assistance from P&R. There currently is a temporary cricket field on the site and a newly constructed skate park just off the footprint of the landfill to the south.

Surface emissions sweeps are conducted quarterly and there are two gas monitoring probes with only trace levels of gas detected. The only issues at the site are the on-going surface maintenance requirements and coordination with P&R. The three groundwater monitoring wells sampled twice yearly have not shown any indications of landfill related constituents.

Mission Bay Landfill (MBL): Located in Council District 6 in Mission Bay Park between the San Diego River and Mission Bay. The site was operated as a municipal landfill from July 1952 to December 1959 to infill wetlands after construction of the river channel and during construction of Mission Bay Aquatic Park. Cover material is mostly hydraulic fill from the dredging of Mission Bay which was placed from 1959 to 1969. The site received approximately 2,280,000 tons of refuse and occupies approximately 113 acres.

About 31% of the surface area is covered by asphalt and concrete (roads, parking lots, and pathways). South Shore Park facilities are maintained by P&R and the remainder of site is maintained by LM&M as open space. Grades, berms and storm water collection appurtenances are maintained to promote positive drainage. Mulch from the Miramar Greenery operation is applied to landfill surface to prevent erosion and slow the proliferation of weeds. A model airplane flyers club has an airfield and utilizes a portion of the site through a ROE permit with READ. The old age and relative shallow depth of the trash result in no significant gas emissions, as confirmed by surface sampling and APCD ambient air testing. As such, there is no LFG collection system at MBL as there is no significant human health risk.

From 2002 to 2006 a site assessment was conducted through a Technical Advisory Committee to address concerns regarding potential human health impacts of the MBL. The final site assessment report dated September 2006 concluded that no human health risks exist today for recreational users of Mission Bay Park. Groundwater and surface water monitoring continues with a network of eight wells and four surface water sampling locations at the site. These are sampled quarterly with twice yearly reporting. Issues at the site include: levels of responsibility between P&R, ESD and Sea World; endangered species (both plant and bird); the close proximity to both the San Diego River and Mission Bay; and evidence of low level offsite migration in groundwater wells.

Montgomery Demolition Fill (MDF): Located in Council District 6 at the extreme east end of the Montgomery Field Airport property. It was operated by the City to prolong the life of the Miramar Landfill and provide a flat crash zone on the approach to the airport. The site was used from 1974 to 1991 to landfill approximately 1,100,000 tons of unclassified, demolition, inert material. The site occupies approximately 17 acres and is maintained as open space by Airports. Being comprised of inert material, the site does not undergo any of the settlement and LFG generation issues of other landfill sites. Because of the type of material buried at this site, neither a groundwater monitoring nor landfill gas collection system is required by regulations to be installed.

South Miramar Landfill (SML): Located in Council District 7 east of I-805, south of the United States Marine Corps' Miramar Air Station, south of the active Miramar Landfill and adjacent to SR-52 which bisects the southern portion of the landfill. The landfill began receiving waste in December 1959 after the MBL closed and continued to receive refuse until May 1973. The site received approximately 2,500,000 tons of refuse and occupies approximately 188 acres.

LM&M maintains the site as open space under a lease from the United States of America which is administered by the United States Navy. Grades, pipes, berms and storm water collection appurtenances are maintained to promote positive drainage. Mulch from the Miramar Greenery operation is applied to slopes and top decks to prevent erosion and slow the proliferation of weeds. In 2007, excess excavation soil from the Kinder Morgan Breakout Tank Project immediately to the west of the site was imported and placed, free of charge, to provide additional cover material and reestablish grade.

The landfill gas collection system is owned by the City but operated and maintained by a privatizer that co-mingles the LFG with digester gas from the Metro Biosolids Center (MBC) to fuel their cogeneration system at MBC. The collected gas from this site contributes to millions of dollars of electricity cost savings for MBC and landfill office building operations.

Though a privatizer operates and maintains the LFG collection system, LM&M ensures it is operated in full compliance with APCD requirements, and that site emissions are in compliance. Surface emissions sweeps are conducted quarterly. Ten offsite gas probes are monitored on a quarterly basis and reported quarterly to the LEA. A groundwater monitoring network consisting of nine groundwater wells is sampled twice yearly with twice yearly reporting to the RWQCB. Issues at the site include: operation and maintenance of the LFG system by the privatizer; old storm drains in need of replacement on the slopes (a CIP project is pending); and evidence of offsite landfill gas migration in both groundwater and gas probes.

North Miramar Landfill (NML): Located in Council District 7 east of I-805, east of the active Miramar Landfill, and immediately south of the United States Marine Corps' Miramar Air Station. The landfill began receiving waste in May 1973 after the SML closed and continued to receive refuse until June 1983. The site received approximately 6,900,000 tons of refuse and occupies approximately 193 acres.

LM&M maintains the site as open space under a lease from the United States of America which is administered by the United States Navy. Grades, pipes, berms and storm water collection appurtenances are maintained to promote positive drainage. Mulch from the Miramar Greenery operation is applied to slopes and top decks to prevent erosion and slow the proliferation of weeds.

The landfill gas collection system is owned, operated and maintained by a private firm that co-mingles the LFG with digester gas from the Metro Biosolids Center (MBC) to fuel their cogeneration system at MBC. The collected gas from this site contributes to millions of dollars of electricity cost savings for MBC and landfill office building operations. LM&M performs monitoring to ensure that site emissions are in regulatory compliance. A groundwater monitoring network consisting of seven groundwater wells is monitored twice yearly with twice yearly reporting to the RWQCB. The only issues at the site are the on-going surface maintenance

requirements and operation and maintenance of the LFG system. No evidence of offsite landfill gas migration is present in groundwater.

Burn Sites are locations where trash was burned either at the site, or burned in a different location and transported to the site for disposal (see Appendix 1 for sites monitored by LM&M). Burning of trash was common practice in order to minimize disease carrying vectors and reduce the volume of the waste mass. The residue remaining at these burn sites is referred to as "burn ash". Burn ash is often found to contain elevated levels of metals such as Lead, Copper and Zinc that originated from food cans, crystal glassware and lead paint. As a result of these elevated concentrations of metals, burn ash is often found to be hazardous.

Beginning in the early 90's, the California Integrated Waste Management Board and the Department of Toxic Substances control began notifying owners and/or responsible parties to perform site assessments, and test the soils, to determine if the sites were hazardous. The City has assessed all burn sites that identified the City as a responsible party, and has remediated or cleaned-up the sites where a health or environmental threat was identified. Attached in Appendix 5 is a summary of the status of the City's burn dumps. The City must continue to routinely inspect and maintain these burn sites and report all activities to the Local Enforcement Agency.

Financial Status of Sites:

Only West Miramar is fully funded for closure/post closure activities. Six (6) of the other sites were operated by the General Fund with no disposal fees charged to users, one charged fees for disposal but did not envision the promulgation of post closure regulations and one (PHPL) was operated by the County, so there is no specifically designated revenue source for all eight (8) of these closed landfill sites. Funding for the LM&M landfill and burn site functions are currently derived from the tipping fees at the Miramar Landfill. Current State legislation, AB32- Methane Control Measures for MWS landfills, has the potential to cost nearly \$2 million dollars for landfill cover enhancements and an additional \$800,000 per year for personnel and contractual costs to comply with the surface emission standards proposed. All financial obligations for continued regulatory compliance at the closed sites would likely become the responsibility of the General Fund after the Miramar Landfill closes if an alternative funding mechanism is not secured for the future.



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ATTACHMENTS



David Jarrell
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1. Solid Waste Sites (map)
2. Laws and Regulations Influencing Site Operations
3. Definitions of Terms for Solid Waste Sites
4. Closed Landfill Information
5. Burn Site Status