THE CITY OF SAN DIEGO

DATE ISSUED: December 2, 2009 REPORT NO. 09-151

ATTENTION: Natural Resources and Culture Committee
Agenda of December 9, 2009

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 (burn dumps) spread throughout the City (see Appendix 1 for a map of sites). Regulations regarding both active and closed landfills have become increasingly stricter as the possible threat to public health and the environment from decomposing refuse has been recognized. Landfill liners were not regulatory required 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 ash (burn dumps) 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, on-going International Standards Organization (ISO) certification services for the City's active landfill at Miramar 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 27of 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.

Also through the RWQCB, 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 which usually involves various park committees. 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 <District 3, Gloria> (ASL) is located 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 <District 3, Gloria> is located in 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 <District 4, Young> (SCL) is located in 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 <District 4 Young> (PHPL aka Sweetwater #3) is located 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 the1980'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 <District 6, Frye> (MBL) is located 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 <District 6, Frye> is located 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 <District 7 Emerald> (SML) is located 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 <District 7 Emerald> (NML) is located 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 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.

A privatizer operates and maintains the LFG collection system, and 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 by the privatizer. 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 elevate 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 proactively identified and assessed all burns 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. Five (5) 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 seven (7) of these 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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Environmental Services Director

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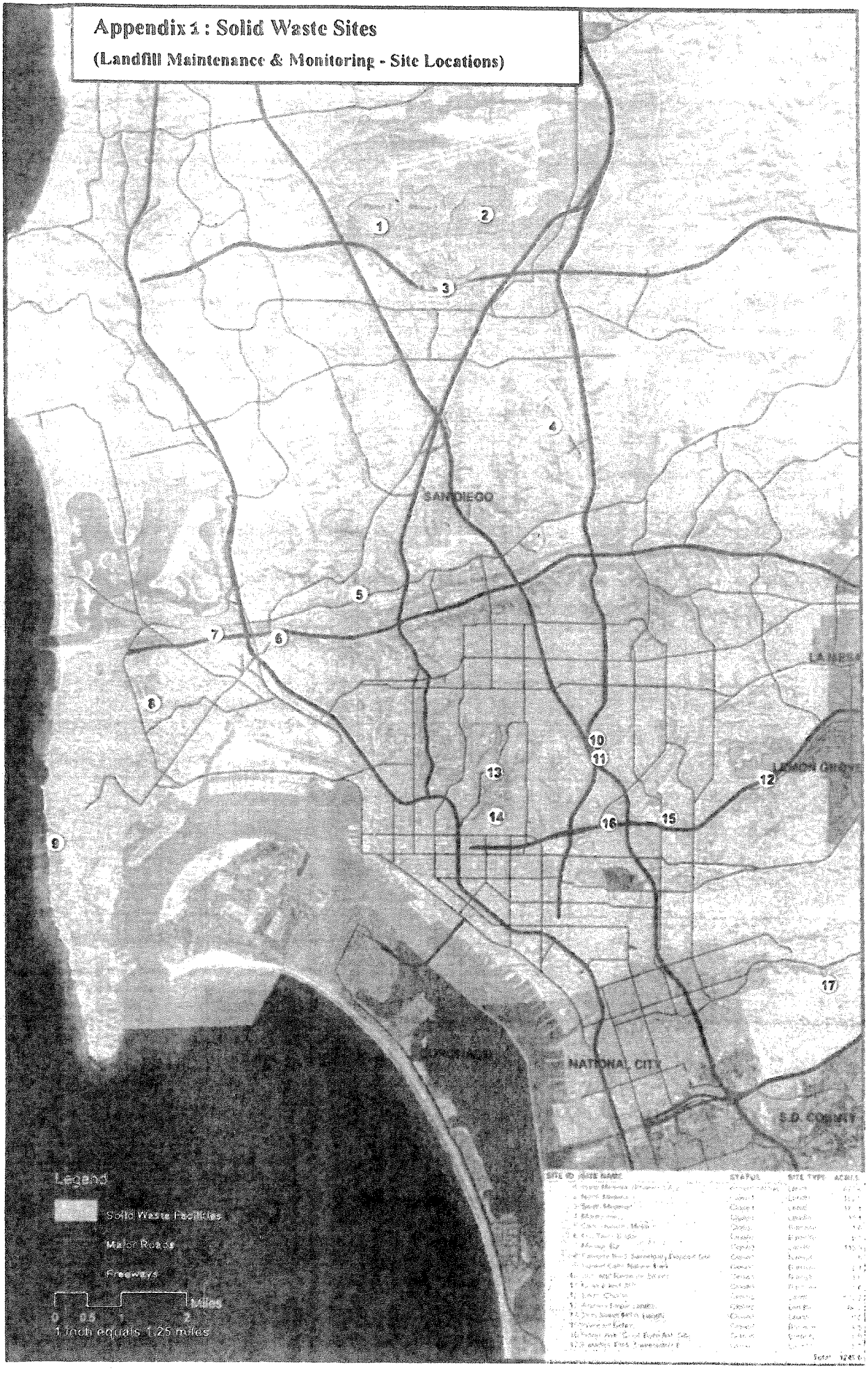
Deputy Chief of Public Works

ATTACHMENTS

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

Appendix 1 : Solid Waste Sites

(Landfill Maintenance & Monitoring - Site Locations)



Appendix 2

Federal Laws and Regulations Influencing Site Operations

	Law or Regulation	Regulation Type	Enforcement Agency	Description
1	US Code Clean Water Act Title 33 Chapter 26	Federal (F)	*	Outlines restoration and maintenance of chemical, physical and biological integrity of nation's waters
2	CFR Title 40 Part 50	F	*	National Primary and Secondary Ambient Air Quality Standards
3	CFR Title 40 Part 51.156	F	*	Review of New Sources and Modifications
4	CFR Title 40 Part 52.21	F	*	Prevention of Significant Deterioration
5	CFR Title 40 Part 60 *Subpart 60 GG *Subpart 60 WWW	F	*	Standards of Performance (SP) for New Stationary Sources *SP for Stationary Gas Turbines *SP for Municipal Solid Waste Landfills
6	Stormwater Pollution Prevention Plan CFR Title 40 Part 122.26	F	*	Permit Requirement Outline for Stormwater Discharge
7	CFR Title 40 Part 136	F	*	Test Procedures for Analysis of Pollution
8	CFR Title 40 Part 257	F	*	Solid Waste Disposal Facility Criteria
9	CFR Title 40 Part 258 Subtitle D	F	*	Municipal Solid Waste Landfill Criteria
10	CFR Title 40 Part 445	F	*	Landfills Point Source Category
11	US Code Endangered Species Act Title 16 Chapter 35	F	*	Conservation of the Ecosystems Inhabited by Endangered and Threatened Species
12	Wildlife and Fisheries CFR Title 50: *Part 13 *Part 21.14	F	*	Federal Fish and Wildlife *Fish and Wildlife Service Permit *Migratory Bird Depredation Permit
13	US Code Title 16 Chapter 7: 703 through 712	F	*	Migratory Bird Treaty - Seagull Control
14	Wildlife and Fisheries CFR Title 50 Part 17: *Subpart 17.22 *Subpart 17.32	F	*	Endangered and Threatened Wildlife and Plants *Permit for Scientific Purposes, Enhancement of Propagation or Survival or for Incidental Taking *General Permit for Threatened Wildlife

Appendix 2

State/Local Laws and Regulations Influencing Site Operations

	Law or Regulation	Regulation Type	Enforcement Agency	Description
15	California Code of Regulations Title 27 (Landfill Regulations/ Environmental Protection)	State (St)	CIWMB/ SWRCB	Consolidated Regulations for the Treatment, Storage, Processing, and Disposal of Solid Waste
16	California Public Resources Code (CPRC) Divisions 30 and 31 (Sections 40000-50002)	St	CIWMB	Solid Waste Facilities, Enforcement, Solid Waste Disposal Site Clean-Up and Maintenance, Garbage and Refuse Disposal
17	Board Resolution No. 93-62	St	SWRCB	Policy for Regulation of Discharges of Municipal Waste.
18	Board Order No. 97-03-DWQ	St	SWRCB	National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS 000001 industrial permits for active and inactive landfills (various permits)
19	Municipal Storm Water Permit Order No. R9-2007-0001, NPDES Permit No. CAS0108758	St	SWRCB/ RWQCB	NPDES - Waste Discharge Requirements for Discharges of Urban Runoff for all dischargers within the City of San Diego
20	California Assembly Bill No. 939	St	CIWMB	Establishes a Waste Management Hierarchy for Reducing the Amount of Waste Going to Landfills
21	California Environmental Quality Act (CEQA) CCR Title 14	St	Various	Ensures all possible environmental impacts are adequately addressed either through mitigation, change of project scope or no project at all.
22	California Assembly Bill No. 709	St	CIWMB	Protocols for site investigation and remediation at burn site dumps.
	Law or Regulation	**Regulation Type**	**Enforcement Agency**	**Description**
23	Air Pollution Control District (APCD) Rules 59 and 59.1	Regional/ Local (R/L)	APCD	Control of Waste Disposal Site Emissions for Municipal Solid Waste Landfills
24	Title V Operating Permit	R/L	APCD	Identifies all Federally Enforceable Requirements Regarding Air Pollution
25	San Diego Municipal Code Chapter 6 Article 6 Division 01	R/L	City of SD	Rules for the Collection, Transportation, Processing, and Disposal of Solid Waste in the City of San Diego
26	Regional Water Quality Control Board (RWQCB) Orders 87-54, 93-86, 94-28, 96-15, 97-11 & R9-2003-000	R/L	RWQCB	Maintenance and Waste Discharge Requirements for various landfills
27	Solid Waste Facility Permits: *No 37-AA-0020 *No 37-SS-0020	R/L	CIWMB	State permit for Miramar Landfill
28	APCD Permit No. 971782	R/L	APCD	Permit Regarding Use of a Trommel Screen
29	APCD Permit No. 911499	R/L	APCD	Permit to Operate Diamond Z Grinder

* Many Federal regulations have been passed down to the State for enforcement. California sometimes surpasses (though not replaces) many Federal requirements with their own more stringent standards.

Landfill Maintenance & Monitoring ensures compliance with these & other rules and regulations.

Appendix 2

Applicable Regulations for LM&M
Landfill Gas/Groundwater Management

Process: LFG Migration Probe Monitoring (quarterly)
Regulations: California Code of Regulations (CCR) Title 27, Paragraph 20919.
Miramar – Code of Federal Regulations (CFR) 40, Part 258, Subtitle D.

Process: LFG Surface Emissions Survey (quarterly at Closed Landfill sites)
Regulations: (CCR) Title 27, Paragraph 20919. San Diego Air Pollution Control District Rule 59. APCD permits to operate #860288, 900448, and 921051.

Process: LFG Surface Emissions Survey (quarterly at Active Miramar Landfill)
Regulations: San Diego Air Pollution Control District Rule 59.1. APCD permits to operate #930483, 960630, and 971254.

Process: LFG System Repair and Maintenance (yearly)
Regulations: (CCR) Title 27, Paragraph 20919. RWQCB Order 97-11.

Process: LFG Recovery System Design/ Construction (yearly)
Regulations: (CCR) Title 27, Paragraph 20919. RWQCB Order 97-11.

Process: Groundwater (GW) Sampling (quarterly)
Regulations: (CCR) Title 27, Subchapter 3. *Miramar* - (CFR) 40, Part 258, Subtitle D. RWQCB Orders 93-86, 94-28, 96-15, and 97-11.

Appendix 3: Definitions of Terms for Solid Waste Sites

The following definitions are provided for use in reading LM&M NR&C Informational Report and do not represent the complete technical definitions of the terms.

Landfill Gas (LFG): the gas naturally generated as the trash decomposes. It is a very moist gas that is predominantly methane, which is explosive in the 5 to 15 % concentration range and carbon dioxide. Typically, also contains other compounds such as hydrogen sulfide, which has an obnoxious order and can add to the asphyxiation danger of landfill gas, and volatilized organic chemicals (benzene, toluene, etc. which are known carcinogens).

Condensate traps: low spots in the landfill gas collection system where sumps are placed for collecting liquids entrained within the landfill gas

Flare station: suction blowers and incinerator stack for destroying collected landfill gas

Gas extraction well: a perforated pipe placed in the waste mass. Suction is applied to the pipe to extract gases produced by waste decomposition

Gas monitoring probe: a perforated pipe placed into native soils just outside the landfill boundary to check for landfill gas migration beyond the waste mass

Groundwater monitoring well: a perforated pipe placed in native soils just outside the landfill boundary to allow for groundwater sampling as a check for contamination migrating beyond the waste mass

Lysimeter: a shallow soil probe placed just outside the waste mass to check for the presence of soil moisture and allow liquid sampling if moisture is present. Intent is to "intercept" contamination before it reaches deeper groundwater.

Burn Ash: residual from burning of municipal solid waste. The practice of low temperature incineration was common throughout the United States prior to modern sanitary landfills. It is often found to contain elevated concentrations of lead, copper and zinc and classified as hazardous.

Appendix 4: Closed Landfill Information

City of San Diego Closed Landfill Information

	South Chollas	Arizona Street	26th Street	Paradise Hills	Mission Bay	Miramar Landfills[1]	Montgomery	Totals
Refuse Acres	170.15	66.21	0.84	5.65	113.34	857.39	17.10	1230.7
LFG Wells *	159	74	0	0	0	272	0	505
LFG Probes *	114	19	0	4	0	43	0	180
LFG Traps	26	7	0	0	0	?	0	33
LFG Flares	2	1	0	0	0	2	0	5
LFG Detectors *	37	8	0	2	0	13	0	60
Surface Tests/Year	4	4	0	4	1	4	0	17
Groundwater (GW) Wells *	7	6	0	3	8	32	0	56
GW Lysimeters *	2	2	0	2	4	3	0	13
Surface Water *	0	0	0	0	0	8	0	8
Number of Times/Year	2	2	0	2	4	2	0	12
Total GW Tests	18	16	0	10	48	86	0	178
NPDES *	0	0	0	0	2	14	0	16

* monitoring points total - 838

1. Miramar Landfills consist of the closed South Miramar [188.1 Ac] and North Miramar [192.9] Sites and the active West Miramar (Phases 1 [238.41 Ac] & 2 [237.98 Ac]) Landfills. Surface maintenance on the active West Miramar Landfill is performed by WRAD operational staff.

2. Eight (8) burn ash sites have a total area of approximately 8.3 acres.

3. Total property area of closed landfill sites is approximately 1038 acres.

Appendix 5: Summary of City Burn Sites

Map ID	Site Description	History/Status	Current Responsibility
5	Camp Kearny Mesa (Francis Parker School) Linda Vista District 6 (Frye)	City dumped material at site. • 1999 burn ash found on slope of Francis Parker School and North Rim Court. • Assessment performed • Remediated site by removing top 3 feet of contaminated soil on Francis Parker Athletic field. Fenced and secured area of shallow ash along slope of North Rim Ct.	Quarterly inspections Site Maintenance
6	Old Town Bridge (San Diego River Channel) District 2 (Faulconer)	City (Park & Rec.) owned. • Assessment performed, elevated levels of metal found • Given the location of the burn ash in the river channel, and the continuous flow of water in the channel, the site is not considered an immediate public health threat. • No formal notification from RWQCB to perform remediation has been received.	Quarterly inspections
8	Famosa Blvd. (Cleator Park & Correia Middle School) Ocean Beach District 2 (Faulconer)	City (Park & Rec.) owned • 2003 assessment of burn site on school property was performed by the School District. • 2003 City performed assessment of burn site on Cleator Park and along Famosa Blvd. • Elevated levels of metals/contaminated soils were found below surface on the Correia Middle school athletic field and on the slopes of Cleator Park and along Famosa Blvd. • School District is in the process of obtaining permits to develop athletic field and install a retaining wall along Famosa Blvd. Any burn ash within the project area will be remediated at that time.	Quarterly inspections Site Maintenance
9	Sunset Cliffs Ocean Beach District 2 (Faulconer)	City (Park & Rec) owned. • 2003 assessment of site was performed by CIWMB. Contaminated soils were found just below the surface, and therefore not considered an immediate public health threat. • Park and Rec have identified burn site in their Master plan for the Sunset Cliffs Park. • Remediation to occur as part of development of the site	Quarterly inspections Site Maintenance

Appendix 5: Summary of City Burn Sites

10	38th & Redwood St City Heights District 3 (Gloria)	City Owned property. • During assessment of site, radioactive material found. • 9 residential properties and a city vacant lot are located on top of the burn site. • 2001 City along with EPA remediated site by removing top 3 feet of ash, radioactive material, covering with clean soil, and landscaping. • 6 Property owners compensated for "Loss of Use" and "devaluation of property", and a Deed Restriction was recorded on their property • 3 properties were purchased by the City, a deed restriction was recorded and the property resold Cost of project: City of San Diego $1.1 Mil EPA $1.2 Mil CIWMB Matching Grant $750 K Total $3.05 Mil	Quarterly inspections Site Maintenance
11	38th & Quince St City Heights District 3 (Gloria)	City dumped material at the site. • 13 properties located on top of on burn site. • 2001 City contracted with EPA to remediate site by removing top 3 feet of ash, covering with clean soil, and landscaping. • Property owners were compensated for "Loss of Use" and "devaluation of property", and a Deed Restriction was recorded on their property Cost of project: City of San Diego $ 850 K CIWMB Matching Grant $ 750 K Total $1.6 Mil	Quarterly inspections Site Maintenance
15	Webster School Chollas Creek District 4 (Young)	City dumped material at the site. School District is the current owner. • Site assessment was performed on the site. A portion of burn ash exists within the city ROW and under Fairmont Ave. • School District under the direction of DTSC • As part of the construction of an outdoor lunch area, several feet of contaminated soils were removed and new soils brought in.	No City responsibilities anticipated at this time
16	Home Ave Chollas Creek District 4 (Young)	City dumped material at site, property is owned by Private Party • City constructed Home Ave over a portion of the burn site. • Owner, under direction of LEA performed assessment of property. Elevated levels of metals found • Property owner secured and fences area of burn ash on is property • City crews were constructing a sidewalk along Home Ave and burn ash was discovered. • Burn ash was stockpiled and removed from the site.	Quarterly inspections Site Maintenance