FUGRO WEST, INC.

# WATER RESOURCES ASSESSMENT FOR THE COLD CANYON LANDFILL EXPANSION ENVIRONMENTAL IMPACT REPORT

Prepared for:
MORRO GROUP

March 2008
Fugro Project No. 3571.001

Draft

**FUGRO WEST, INC.**

4820 McGrath Street, Suite 100
Ventura, California 93003-7778
**Tel: (805) 650-7000**
Fax: (805) 650-7010

March 4, 2008
Project No. 3571.001

Morro Group
1422 Monterey Street
San Luis Obispo, California 93401

Attention: Mr. Keith Miller, Project Manager

Subject: Water Resources Assessment for the Cold Canyon Landfill Expansion, Environmental Impact Report

Dear Mr. Miller:

This report provides an evaluation of the groundwater resources for the proposed Cold Canyon Landfill (CCL) Expansion. The report describes the environmental setting relative to groundwater resources, the reliability of the groundwater supply, and identifies potential groundwater quantity and quality impacts associated with the planned use of groundwater for the proposed landfill expansion.

Principal conclusions of the assessment include:

1. The landfill expansion will require an estimated water demand of up to 80,000 gallons per day (gpd), which is an increase of approximately 20,000 gpd relative to current operational demand of up to 60,000 gpd.
2. The on-site wells are capable of meeting the estimated water demand for the proposed landfill expansion. Existing wells at the landfill are capable of providing sufficient groundwater for the average daily operational demand (dust control, composting, MRF and non-potable use) with or without supplemental supplies. Water demand associated with grading activities for future landfill modules could create greater short-term water demand that will be met by importation of water from off-site sources.
3. The quality of groundwater in the area unaffected by landfill operations is generally poor, such that landfill operational staff reportedly rely on bottled water for potable needs. The San Luis Obispo County Environmental Health Department will require the CCL to be permitted as a non-transient non-community water system. Further, the CCL will be required to submit chemical and bacterialogical analyses of all water sources that could come in bodily contact with employees to prove that the water is potable.
4. The estimated increase in water use for the landfill expansion of about 9 acre feet per year will not have a significant impact on existing groundwater uses in the vicinity of the landfill.
5. A general review of the existing groundwater monitoring program indicates it is consistent with the RWQCB objectives relative to protection of groundwater quality. The current waste discharge requirements (WDRs) and future WDRs that will be adopted for expansion of the landfill will address compliance issues of the landfill expansion on groundwater quality. The forthcoming RWQCB guidance (WDRs, preliminary closure, and post-closure maintenance plans) will prescribe methods to maintain the integrity of the final cover, drainage system, leachate control system, landfill gas system, and groundwater monitoring system in a manner that protects groundwater quality.

We will remain available to respond to questions you or the County of San Luis Obispo may have regarding groundwater resource issues for the proposed Cold Canyon Landfill Expansion.

Sincerely,

FUGRO WEST, INC.

Timothy A. Nicely, P.G.
Project Hydrogeologist

David A. Gardner, P.G., CHg
Senior Vice President

Copies Submitted: (1-Pdf)

Draft

## CONTENTS

Page

INTRODUCTION ..... 4
Data Sources ..... 4
Regulatory Setting ..... 5
ENVIRONMENTAL SETTING ..... 6
Location ..... 6
Climate ..... 6
Geology ..... 6
Monterey Formation ..... 7
Pismo Formation ..... 7
Younger Deposits ..... 7
Regional Hydrogeology ..... 7
Local Hydrogeology ..... 8
Groundwater Supply ..... 9
On-Site Supply ..... 9
Private and Public Water Companies ..... 11
Water Demand ..... 11
Current On-Site Water Demand ..... 11
Future On-Site Water Demand ..... 13
Daily Operations ..... 13
Module Construction ..... 14
Landscaping ..... 15
Proposed On-Site Supply ..... 16
Proposed Onsite Production ..... 16
Proposed Imported Water ..... 16
Water Demand Within The Study Area ..... 17
Hydrogeologic Connectivity Between Landfill and Adjacent Properties ..... 19
Groundwater Recharge Estimate ..... 22
Groundwater Quality ..... 23
Existing Groundwater Quality ..... 23
Current Groundwater Quality Monitoring ..... 25
Leachate Collection System ..... 26
IMPACTS ANALYSIS ..... 26
Violation of water quality standards or waste discharge requirements ..... 27
Depletion of groundwater supplies or interference with groundwater recharge ..... 28
Contribution to runoff ..... 28
Substantial degradation of water quality ..... 29
Increased Agricultural Use ..... 29
Monitoring and Maintenance of Landfill Caps ..... 29
SUMMARY AND CONCLUSIONS ..... 29

Draft

REFERENCES ..... 31

Draft

## TABLES


| | | Page |
|---|---|---|
| 1 | Summary of On-Site Water Well Data | 11 |
| 2 | Summary of Estimated Current On-Site Water Demand | 12 |
| 3 | Summary of Existing and Proposed Daily Tonnage Limits | 13 |
| 4 | Summary of Estimated Future On-Site Water Demand | 14 |
| 5 | Summary of Estimated Landscape Water Demand | 15 |
| 6 | Summary of Estimated Current and Maximum Future Groundwater Demand within the Study Area | 19 |
| 7 | Predicted Drawdown in Well No. 1 | 20 |
| 8 | Predicted Drawdown in Well No. 2 | 20 |
| 9 | Gross Water Balance for the Hydrogeologic Study Area | 23 |
| 10 | Summary of Groundwater Monitoring Requirements | 25 |


## PLATES


| | Plate |
|---|---|
| Vicinity Map | 1 |
| Site Location Map | 2 |
| Regional Groundwater Basins and Geologic Map | 3 |
| On-Site Groundwater Well Location Map | 4 |
| Groundwater Hydrographs | 5 |
| Typical Groundwater Contour Map | 6 |
| Hydrogeologic Study Area | 7 |
| Surrounding Land Use and Water Well Location Map | 8 |


## APPENDICES


APPENDIX A REVISED WASTE DISCHARGE REQUIREMENTS

APPENDIX B PRECIPITATION AND EVAPORATION DATA

APPENDIX C SITE PHOTOGRAPHS

APPENDIX D ON-SITE WELL INFORMATION

APPENDIX E SUMMARY OF RECENT LEACHATE ANALYTICAL RESULTS


Draft

## INTRODUCTION

This water resources assessment for the Cold Canyon Landfill (CCL) expansion Environmental Impact Report (EIR) evaluates potential impacts of the proposed expansion on groundwater resources. It is the aim of the water resources assessment to identify potentially significant groundwater impacts to the water supply and quality both on-site and in the surrounding area.

The goals of this water resources assessment as related to water supply are to:

- Compile and review information related to the project site and underlying groundwater basin;
- Describe the estimated current and future water demand for the project;
- Assess the hydrologic connectivity between the CCL and adjacent properties;
- Assess on-site water availability;
- Identify potential short- and long-term impacts to local groundwater supplies including potential drawdown effects from on-site wells;
- Identify potential impacts to local groundwater supplies from the cumulative demand of other groundwater users; and
- Recommend mitigation measures to minimize potential impacts related to groundwater availability.

The goals of the water resources assessment as related to water quality are to:

- Compile and review potable water quality baseline data in the area of the project site;
- Identify potable water quality impacts should the aquifer experience an overdraft condition, intensification of agricultural uses, topographic alteration, short- and long-term water resource impacts from leachate migration, adequacy of the existing groundwater monitoring network; and,
- Recommend mitigation measures to minimize potential impacts related to groundwater quality, including: short- and long-term leachate production, maintenance of the landfill caps, composition of the leachate, ability of the groundwater monitoring system to detect leakage from the landfill liner, and a qualitative description of potential clean-up procedures if contamination is detected.

## DATA SOURCES

Data were collected from local, regional, state and federal agencies describing existing local water demand, land use, climate, hydrology, and hydrogeology. Well completion reports were obtained from the California Department of Water Resources (DWR) for an area approximately 1 mile in radius from the CCL. Many geologic and hydrogeologic reports and maps have been prepared that frame the geology and regulatory framework at the periodically

Draft

expanded and highly-regulated landfill. Baseline data for this EIR have been extracted largely from published data sources and through discussions with CCL staff. We reviewed hydrogeologic site characterizations prepared by EMCON Associates (1992) and Golder (2007). Groundwater monitoring was discussed in several reports by RMC Geoscience (2006; 2007a, 2007b). An additional annual groundwater monitoring report was prepared by RMC Geoscience in January 2008; however, it was not available for inclusion in this report. We also reviewed a final EIR of the site prepared by ERCE (1991) in advance of a prior expansion.

In addition to the above sources, we also contacted and met with CCL general manager, Mr. Bruce Rizzoli (2007), to better estimate their use of groundwater to meet the historic and future water demands at the site. CCL staff also provided data describing existing production wells and data for current and historical water demand of the CCL. The meeting also included a discussion of any limitations the CCL may have experienced in providing a reliable source of water during construction of the landfill modules (cells) and their estimates of future water demand related to the proposed expansion.

## REGULATORY SETTING

The California Environmental Quality Act provides authority to the County of San Luis Obispo to assess the extent to which proposed projects such as this may contribute to groundwater overdraft within individual basins and to determine whether the incremental contribution to the overdraft is considered significantly adverse. To accomplish this, the Governor's office of Planning and Research (1994) established a "threshold of significance criteria" that provides a way of defining thresholds of significant impacts. It is the intent of this water resources assessment to identify whether the proposed project will have any significant impact on the water resources of and surrounding the project site. Specific thresholds, related to groundwater supply and quality, were adopted from CEQA guidelines.

The regulation of impacts to surface and groundwater resources are within the jurisdiction of local, state, and federal agencies including the California Regional Water Quality Control Board (RWQCB) and the California Integrated Waste Management Board (IWMB). Current permits required for the operation of the CCL include Solid Waste Facilities Permit No. 40-AA-0004, Revised Waste Discharge Requirements (WDR) Order No. R3-2002-0065, Monitoring and Reporting Program (MRP) No. R3-2002-0065, Approved Land Development Plan Permit No. D860156D, and Title V Permit to Operate No. 37 (RMC Geoscience, 2007b).

The WDR describes requirements to protect groundwater quality related to the operation of the CCL. The WDR discusses the site description and history of monitoring; status of the monitoring programs; basin water quality issues; prohibitions; provisions for groundwater monitoring, onsite use of water, post-closure maintenance plans, reporting, and general provisions. The MRP discusses the self-monitoring program to document compliance with RWQCB requirements as follows. The MRP identifies the monitoring and observation schedules; site, leachate and drainage system inspections; specific monitoring points; sampling methods, analyses, frequency; and record keeping and reporting requirements. The MRP also summarizes the contingency response necessary if a release is tentatively identified including general conditions for the preparation of an Evaluation Monitoring and Reporting Program, and

release discovery responses. The WDR is presented in Appendix A – Revised Waste Discharge Requirements.

## ENVIRONMENTAL SETTING

### LOCATION

The CCL is currently a 121-acre, permitted Class III solid waste disposal site located approximately 7 miles southeast of the City of San Luis Obispo in a rural area of San Luis Obispo County, California. The Santa Lucia Mountains are located east of the site, and the Edna Valley located to the east and north. The actively producing Price Canyon Oilfield is located approximately 1 mile to the west. The general location of the CCL is presented as Plate1 -Vicinity Map. The specific location of the CCL is presented as Plate 2 - Site Location Map.

The proposed project would increase the facility footprint by approximately 88 acres and the disposal area by approximately 46 acres (Morro Group, 2007). The CCL would be located on four parcels (totaling approximately 209 acres) following expansion onto the properties located southeast of the current site.

### CLIMATE

The CCL is situated within a region that has a Mediterranean climate with warm, dry summers and mild winters. The average annual precipitation is 22.1 inches, which was measured at the San Luis Obispo County Regional Airport located approximately 3.5 miles northwest of the CCL. The standard annual average evapotranspiration rate (ETo) at the Salinas Reservoir (Santa Margarita Lake), located approximately 11 miles northeast, is 5.6 feet per year. Closer to the site, the standard annual average ETo at Lopez Lake, approximately 6 miles east, is 3.7 feet per year (San Luis Obispo County Public Works Department, 2008). ETo measures the loss of water to the atmosphere by evaporation from soil and plant surfaces and transpiration from plants. Environmental data are presented in Appendix B - Precipitation and Evaporation Data.

### GEOLOGY

The Central Coast hydrologic basin planning area, as defined by the Central Coast RWQCB, encompasses all coastal drainages flowing to the Pacific Ocean between the Pajaro River in southern Santa Clara County and Rincon Point on the coast of Western Ventura County. The CCL is located in the southern portion of the 779-square mile Estero Bay watershed immediately downgradient from the San Luis Obispo groundwater basin and upgradient of the narrow northeast-southwest trending lower Pismo groundwater basin (Plate 3, Regional Groundwater Basins and Geologic Map).

The study area is located in the Pismo (geologic) Basin along the northeastern flank of the Pismo Syncline. The Pismo (geologic) Basin is bounded on the northeast by the Huasna fault zone and on the west by the Hosgri fault zone (EMCON, 1992).

Draft

The Pismo Syncline formed during the late Pliocene as part of a tectonic block bounded between the San Andreas fault zone on the east and the Hosgri fault zone on the west. The Indian Knob and Edna faults parallel the northeast limb of the Pismo Syncline within and adjacent the study area. The Indian Knob fault zone is a reverse fault that crosses the northern portion of the site. Reverse displacement of Indian Knob fault has juxtaposed the older Monterey Formation over the younger Pismo Formation. The Edna fault is an inferred high-angle fault (EMCON Associates, 1992).

### Monterey Formation

Within the Pismo (geologic) Basin, the Monterey Formation includes four members. The older two typically consist of dolomitic claystone and siltstone, diatomite, tuffaceous siltstone, and tuff. The younger two members include bedded chert, diatomite and diatomaceous siltstone, tuffaceous sandstone and siltstone, and phosphatic or porcelaneous shale. At the CCL, the exposed Monterey Formation consists of the younger diatomaceous member deposited northeast of a volcanic topographic high (EMCON, 1992). The Monterey Formation sediments include copious organic material that, subjected to heat and pressure due to deformation, produced hydrocarbons. These hydrocarbons accumulated in structural traps and formed significant reserves, including the Arroyo Grande Oil Field located approximately 1 mile west of the CCL.

### Pismo Formation

The Pismo Formation is composed of five members: Edna, Miguelito, Gragg, Belleview, and Squire (Hall, 1973). Each member contains basal gravel or coarse sand deposited in a high-energy environment overlain by a thick, upward-fining sequence of sandstone, diatomaceous siltstone, and claystone deposited in progressively lower-energy environments. At the CCL, the exposed Pismo Formation consists of the Edna Formation (EMCON, 1992).

### Younger Deposits

After the Pismo Formation was deposited, the area was uplifted and eroded by waves and streams that deposited sediments including marine terraces, dunes, alluvium, and landslide deposits. Locally, these deposits are present within the study area in Cañada Verde and west into Price Canyon.

## REGIONAL HYDROGEOLOGY

The principal aquifer of the Pismo (geologic) Basin consists of the recent alluvial deposits. The alluvium consists of sand, gravel and clay to a maximum thickness of 100 feet. The Monterey and Pismo formations that underlie the site are not considered major groundwater aquifers, although they do yield usable quantities of water for small-scale operations such as domestic and livestock purposes. Within the Monterey and Pismo Formations, groundwater generally occurs under semi-confined to confined conditions (EMCON, 1992). Recharge to the aquifer occurs by percolation of stream flow, percolation of