HYDRO GEO CHEM, INC.
Environmental Science & Technology

Memo

To: Brice Zeller

From: James Peck, P.E.

Date: May 20, 2010

Re: South Yuma County Landfill - Contaminated Soil Acceptance Criteria

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This memorandum is provided to summarize South Yuma County Landfill's (SYCL's) waste acceptance criteria for accepting petroleum contaminated soil (PCS),

Regulatory Requirements

Contaminated waste soil is generally treated as solid waste in Arizona, subject to federal hazardous waste listing and characterization criteria. Arizona treats non-hazardous waste soils that are contaminated with petroleum products in three separate categories, special waste PCS, solid waste PCS, and non-regulated soils. Special waste PCS is contaminated soil which contains certain chlorinated aromatic (BTEX) or polynuclear aromatic hydrocarbon (PAH) contaminants at levels above non-residential soil remediation levels. Special waste PCS must be disposed of at a disposal facility authorized by the Arizona Department of Environmental Quality (ADEQ) to accept special waste PCS. Solid waste PCS is contaminated soil which contains BTEX and PAH contaminants at concentrations between the residential and non-residential soil remediation levels. Solid waste PCS can be disposed of as solid waste at any facility authorized to dispose of solid waste. Non-regulated soil is soil that contains BTEX and PAH compounds below the residential soil remediation levels. Non-regulated soil is not regulated as a solid waste but is considered an inert material.

Table 1 lists the appropriate levels of BTEX and PAH compounds in soils for establishing whether or not a soil is special waste PCS, solid waste PCS, or non-regulated soil.

South Yuma County Landfill Permits

The SYCL is a municipal solid waste disposal facility operating under an approved Solid Waste Facility Plan, ADEQ approval No. 50366100.02, as amended January 15, 2010. The SYCL is approved to accept special waste PCS, and is therefore approved to accept all manner of non-hazardous soils contaminated with petroleum products. The ADEQ approved SYCL as a special waste facility for accepting special waste PCS in April 2001 (Approval 302233), which is maintained under SYCL's solid waste facility plan approval. The Solid Waste Facility Plan includes provisions for the acceptance and disposal of special waste PCS and solid waste PCS. The ADEQ solid waste facility plan approval specifically lists special waste PCS as an acceptable waste type at the SYCL.

Waste Acceptance Criteria

SYCL requires all generators of environmentally contaminated soil to submit a waste profile identifying the source of the contamination and provide relevant analytical data characterizing the waste consistent with an approved sampling plan or where appropriate, through generator knowledge in light of known or potential sources of contamination. Contaminated soil that has the potential to leach contaminants in excess of toxicity characteristic criteria are required to provide Toxicity Characteristic Leaching Procedure (TCLP) data on the waste as listed in Table 2. TCLP will be required for PCS soil with potential to leach lead in excess of 100 mg/L. Contaminated soil that classifies as either a listed or characteristic hazardous waste under U.S. EPA hazardous waste classification criteria is not accepted at the SYCL.

Special waste PCS must be accompanied by a special waste manifest including a special waste generator identification number provided by ADEQ. Generators of special waste PCS must submit a sampling plan along with analytical test results from an Arizona Department of Health Services licensed laboratory. Sampling of the special waste PCS must be performed in accordance with the written sampling plan, which must be developed in accordance with the requirements of EPA's SW-846 or ADEQ's Quality Assurance Project Plan.[1] The sampling frequency for waste characterization must be consistent with the approved sampling plan. Analytical sampling data must include polynuclear aromatic hydrocarbons, petroleum aromatics. Other analyses such as soil pH, flashpoint, and total metals may be requested by SYCL depending on the waste generator's profile. An acceptable sampling frequency for PCS soil characterization is as follows:

1-10 cubic yards	2, one from each half
11-20 cubic yards	3, one from each third
21-100 cubic yards	4, one from each quarter
101-500 cubic yards:	1 per 25 cubic yards, maximum of 10 samples
500-10,000 cubic yards:	10 samples plus 1 sample for every 500 cubic yards above 500 cubic yards
>10,000 cubic yards:	20 samples plus 1 sample for every 5,000 cubic yards above 10,000 cubic yards

For solid waste PCS, SYCL requires documentation from the generator verifying that the waste is not hazardous and does not contain any contaminants above the threshold for special waste PCS. Demonstration that the waste is non-hazardous must be provided by the generator and may include a determination of soil pH, soil flashpoint, and toxicity either by the TCLP or by total concentrations of BTEX and metals at levels that could not possibly exceed TCLP thresholds for hazardous waste.

Attachments:
Tables (2)

[1] U.S. EPA, Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition, Volume II: Field Manual, Physical/Chemical Method, Chapter 9, Revision 6, 2007, and ADEQ, Quality Assurance Project Plan, Chapter 9, May 1991.

TABLES

TABLE 1
Petroleum Contaminated Soil Classification Thresholds

Special Waste Constituents (A.R.S. § 49-851A.3	Regulated Contaminants	Solid Waste PCS >Residential SRLs (in ppm, mg/kg)	Special Waste PCS >Non-Residential SRLs (in ppm, mg/kg)
BTEX EPA Method 8260 or 8021	Benzene	0.65	1.4
	Toluene	650	650
	Ethylbenzene	400	400
	Total Xylenes	270	420
PAHS Polynuclear Aromatic Hydrocarbons Commonly found in diesel and lubricant oil	Acenaphthylene	3,700	29,000
	Anthracene	22,000	240,000
	Benz[A]anthracene	6.9	21
	Benzo[A]pyrene	0.69	2.1
	Benzo[B]fluoranthene	6.9	21
	Benzo[K]fluoranthene	69	210
EPA Method 8310	Cyrysene	680	2,000
	Dibenz[A,H]anthracene	0.69	2.1
	Fluoranthene	2,300	22,000
	Fluorene	2,700	26,000
	Indenopyrene	6.9	21
	Naphthalene	56	190
	Pyrene	2,300	29,000

Notes:

ppm = parts per million
mg/kg = milligrams per kilogram

Derived from ADEQ, Petroleum Contaminated Soil Fact Sheet, July 2008, Publication FS 08-14.

Constituent	TCLP limit (mg/L)	Waste Limit - Totals (mg/kg)
Arsenic	5.0	100
Barium	100.0	2000
Benzene	0.5	10
Cadmium	1.0	20
Carbon Tetrachloride	0.5	10
Chlordane	0.03	0.6
Chlorobenzene	100.0	2000
Chloroform	6.0	120
Chromium	5.0	100
Cresol	200.0	4000
o-Cresol	200.0	4000
m-Cresol	200.0	4000
p-Cresol	200.0	4000
2,4-D	10.0	200
1,4-Dichlorobenzene	7.5	150
1,2-Dichloroethane	0.5	10
1,1-Dichloroethene	0.7	14
2,4-Dinitrotoluene	0.1	2
Endrin	0.02	0.4
Heptachlor (and its epoxide)	0.008	0.16
Hexachlorobenzene	0.1	2
Hexachloro-1,3-butadiene	0.5	10
Hexachlorothane	3.0	60
Lead	5.0	100
Lindane	0.4	8
Mercury	0.2	4
Methoxychlor	10.0	200
Methyl Ethyl Ketone	200.0	4000
Nitrobenzene	2.0	40
Pentachlorophenol	100.0	2000
Pyridine	5.0	100
Selenium	1.0	20
Silver	5.0	100
Tetrachloroethene	0.7	14
Toxaphene	0.5	10
Trichloroethene	0.5	10
2,3,5-Trichlorophenol	400.0	8000
2,4,6-Trichlorophenol	2.0	40
2,4,5-TP	1.0	20
Vinyl Chloride	0.2	4

Notes:

mg/L = milligrams per Liter

mg/kg = milligrams per kilogram