



## **Seagull Environmental Technologies, Inc.**

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### **PHASE II ENVIRONMENTAL SITE ASSESSMENT**

#### **2500 North Glenstone Avenue Site**

**Date of Report:** November 10, 2016

#### **SITE BACKGROUND**

Seagull Environmental Technologies, Inc. (Seagull) was tasked by the City of Springfield – Planning and Development Department to conduct a Phase II Environmental Site Assessment (ESA) of the 2500 North (N.) Glenstone Avenue site in Springfield, Missouri. The site is a vacant lot on a 2.21-acre property in Springfield. The site will hereafter be referred to as the “subject property,” or “site.” The subject property is currently owned by Great Southern Bank. Future development plans for the subject property are to build a hotel. Phase II ESA activities at the site were conducted on October 25, 2016. The primary purpose of the Phase II ESA was to confirm or eliminate recognized environmental conditions (REC) specified in the Phase I ESA report for the site, determine the nature and extent of any soil or groundwater contamination, and assess threats to human health and the environment posed by any contamination in soil and groundwater.

The Phase II ESA included the collection of four soil and two groundwater samples (including one soil and groundwater duplicate sample). The soil and groundwater samples were submitted for laboratory analysis of volatile organic compounds (VOC), total petroleum hydrocarbons (TPH)–gasoline range organics (GRO)/diesel range organics (DRO)/oil range organics (ORO), polynuclear aromatic hydrocarbons (PAH), and metals regulated under the Resource Conservation and Recovery Act (RCRA). The soil and groundwater sample results from this Phase II ESA were compared to their respective Missouri Risk-Based Corrective Action (MRBCA) Default Target Levels (DTL). These default values have been established by MDNR to represent protective concentration thresholds for common environmental contaminants, regardless of land use, soil properties, and relevant exposure pathways. For

evaluation purposes, soil sample results were also compared to Missouri Risk-Based Corrective Action (MRBCA) Tier 1 Risk-Based Target Levels (RBTL) for residential and non-residential land use, based on the predominant subsurface soil type (soil type 3 [clayey soil]). The RBTLs were specific to subsurface (greater than 3 feet below ground surface (bgs) soils. The groundwater sample results were also compared to MRBCA Tier 1 RBTLs for residential domestic water use and non-residential dermal contact. Findings and recommendations from the Phase II ESA were as follows:

### Soil

Soil samples collected from the site contained low levels of contaminants. Specifically, the soil samples contained VOCs, PAHs, and RCRA metals. Three VOCs were detected in the samples at concentrations that ranged from 0.0027 J to 0.019 milligrams per kilogram (mg/kg). A J-code means that the analyte was present at an estimated concentration between the method detection limit (MDL) and the reporting limit. The detected VOCs were 2-butanone, acetone, and methylene chloride—all common laboratory contaminants. All of the detected concentrations of VOCs were well below their respective MRBCA standards

PAHs were detected in only one soil sample (SB-2-5-7). The remaining soil samples, including the field duplicate sample (SB-2-5-7-Dup) collected at SB-2, did not contain any detectable PAHs. The following PAHs and their concentration were identified on the subject property: benzo(a)anthracene (0.0091 mg/kg), benzo(a)pyrene (0.0011 mg/kg), benzo(b)fluoranthene (0.0012 mg/kg), benzo(g,h,i)perylene (0.0012 mg/kg), chrysene (0.0011 mg/kg), fluoranthene (0.0019 mg/kg), indeno(1,2,3-cd)pyrene (0.0084 mg/kg), phenanthrene (0.0013 mg/kg), and pyrene (0.0029 mg/kg). None of these detected concentrations of PAHs exceeded any of their respective MRBCA DTLs.

All five soil samples (including the duplicate sample) contained detectable concentrations of the eight RCRA metals. Two RCRA metals—arsenic and lead—were detected at concentrations that exceeded their respective MRBCA DTLs. All samples contained arsenic above its MRBCA DTL of 3.89 mg/kg, ranging from 4.5 mg/kg at SB-4 (from 10 to 12 feet bgs) to 19 mg/kg at SB-2 (from 5 to 7 feet bgs). Additionally, two detected concentrations of arsenic in samples collected at SB-2 (5-7 feet bgs) and SB-3 (10-12 feet bgs) were above the USGS average for arsenic in Greene County, Missouri, soils, which is 8.13 mg/kg. All samples contained lead above its MRBCA DTL of 3.74 mg/kg. Lead was detected between 17 mg/kg at SB-3 (from 10 to 12 feet bgs) and 150 mg/kg at SB-2 (from 5 to 7 feet bgs). None of the lead concentrations exceeded its MRBCA Tier 1 RBTLs established for residential and non-residential subsurface soil, which are 260 and 660 mg/kg, respectively. Additionally, one detected

concentration of lead in a sample collected at SB-2 (5-7 feet bgs) was above the USGS average for lead in Greene County, Missouri, soils, which is 61.55 mg/kg. No other metals were detected at concentrations that exceeded their established MRBCA standards.

The detected concentrations of VOCs, PAHs, and RCRA metals in the soil samples do not pose a risk to future use and/or redevelopment of the site.

### Groundwater

Several VOCs were detected in the two groundwater samples (GW-1 and GW-1-Dup) collected at the site. The following VOCs and their concentrations were identified on the subject property: benzene (0.015 and 0.025 milligram per liter [mg/L]), cyclohexane (0.016 and 0.026 mg/L), ethylbenzene (0.0021 and 0.0035 mg/L), isopropylbenzene (0.0046 and 0.0074 mg/L), methylcyclohexane (0.014 and 0.027 mg/L), and toluene (0.0011 and 0.00092 J mg/L). Of the VOCs detected in the groundwater samples, only benzene was detected at concentrations that exceeded its respective MRBCA DTL and MRBCA Tier 1 RBTL for residential domestic water use of 0.005 mg/L, but did not exceed its MRCBA Tier 1 RBTL for non-residential dermal contact of 1.06 mg/L. Additionally, none of the remaining VOC concentrations exceeded their respective MRBCA DTLs.

TPH-ORO was not detected in either of the groundwater samples. TPH-DRO was detected in only one groundwater sample (GW-1-Dup) at a concentration of 0.28 mg/L. TPH-GRO was detected in both groundwater samples at concentrations of 0.36 and 1.1 mg/L. These detected concentrations of TPH-DRO and TPH-GRO did not exceed their respective MRBCA DTLs of 34.3 and 18.1 mg/L.

Two PAHs were detected in the two groundwater samples: 2-methylnaphthalene (0.0051 J and 0.0046 J mg/L) and naphthalene (0.0041 J and 0.0036 J mg/L). Of the two PAHs, only naphthalene was detected at concentrations that exceeded its respective MRBCA DTL and MRBCA Tier 1 RBTL for residential domestic water use of 0.00109 mg/L, but did not exceed its respective MRCBA Tier 1 RBTL for non-residential dermal contact of 0.0751 mg/L. The detected concentrations of 2-methylnaphthalene did not exceed its MRBCA DTL.

The following metals were detected in the two groundwater samples: barium (0.28 mg/L in both samples), chromium (0.00065 J mg/L in one sample), and selenium (0.0011 J and 0.0012 J mg/L). None of the metals exceeded their respective MRBCA DTLs.

VOCs, TPH-DRO/ORO, PAHs, and metals were detected in soil samples collected at the site, but only concentrations of arsenic and lead exceeded their respective MRBCA DTLs. However, these

concentrations were below their respective MRBCA Tier 1 RBTLs for non-residential surface soil.

Additionally, benzene and naphthalene concentrations in groundwater exceeded their respective MRBCA DTLs and MRBCA Tier 1 RBTLs for residential domestic water, but none of the concentrations exceeded their respective MRCBA Tier 1 RBTLs for non-residential dermal contact.

Based on future development plans to build a hotel on the subject property, the detected concentrations of benzene and naphthalene in the groundwater pose minimal risk to future use. However, the benzene and naphthalene in the groundwater should be taken into consideration if redevelopment plans are to change. If future use of the subject property changes (e.g., residential), additional assessment of soil and groundwater contamination and a vapor intrusion assessment should be conducted near the northeastern portion of the subject property.