January 24, 2025
File No. 27223096.25

Mr. Mike Smith, P.E.
Iowa Department of Natural Resources
Land Quality Bureau
6200 Park Avenue
Des Moines, Iowa 50321

Subject: Assessment of Corrective Measures Extension Request
Northwest Iowa Area Sanitary Landfill
Permit No. 84-SDP-01-74P

Dear Mike:

SCS Engineers, on behalf of the Northwest Iowa Area Solid Waste Agency, is submitting an extension request for the assessment of corrective measures (ACM) for the Northwest Iowa Area Sanitary Landfill (Landfill). A new exceedance of the groundwater protection standard (GWPS) at a statistically significant level (SSL) for arsenic in monitoring well DGP-1500 was reported in the 2024 Spring Sampling Notification, dated October 25, 2024 (Doc #111153). An extension is requested to the timeframes specified in Iowa Administrative Code (IAC) 567-113.10(6)*g* and 113.10(7)*a* to allow time to better characterize the impact at monitoring well DGP-1500.

Background

A previous exceedance of a GWPS at an SSL for trichloroethene in monitoring well DG-1301 required the preparation of an ACM report (Doc #90272) in September 2017. The remedy of passive venting of the subsurface was approved in the renewed permit dated April 3, 2018 (Doc #91990) and is ongoing.

The arsenic SSL in DGP-1500 was first measured in the 1st 2024 semi-annual statistical evaluation. A previous effort of installing a dedicated sampling pump to lower the elevated total suspended solids (TSS) concentration to potentially reduce elevated arsenic concentrations in the monitoring well was ineffective.

To better characterize the impact at DGP-1500, additional fieldwork and data collection and evaluation are needed before the preparation of an ACM as summarized below.

Natural Attenuation and Attenuation Zone Point of Compliance

Monitored natural attenuation is likely to be a component of the groundwater remedy at the Landfill. Additionally, an attenuation zone point of compliance (AZPOC) may be considered in the development of a remedy in the ACM report. In accordance with IAC 567-113.7(5)"a"(2)2, the establishment of an attenuation zone for an existing contaminant release is considered to be an acceptable "site condition," which justifies the placement of the point of compliance (POC) at an alternative location other than 50 feet from the waste boundary. In this case, "waste boundary" refers to the leachate lagoon boundary.

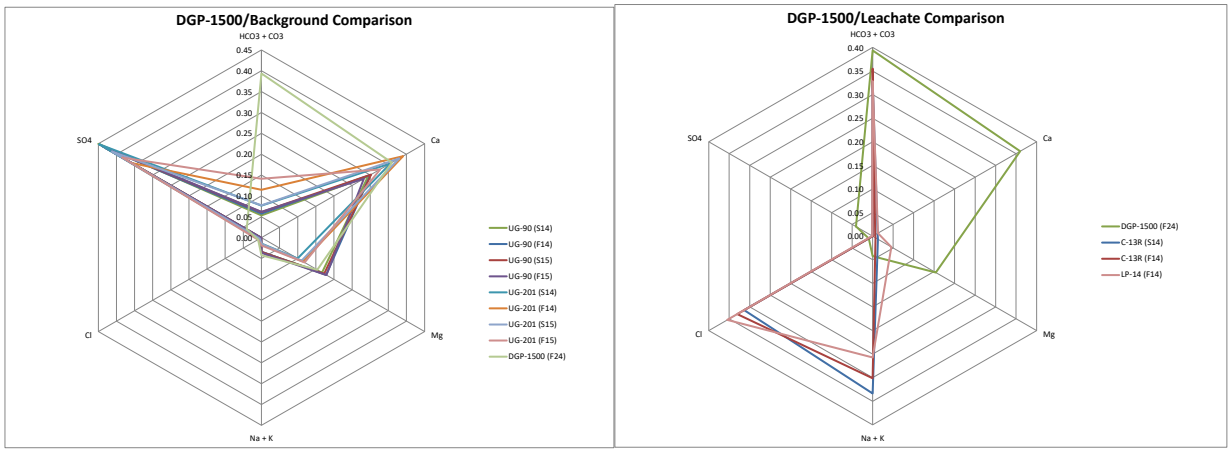
Natural attenuation data for DGP-1500, and potentially a designated AZPOC monitoring well, will be collected before the preparation of an ACM report to evaluate the efficacy of monitored natural attenuation as a component of a remedy. In addition, monitoring wells previously installed

downgradient of monitoring well DG-1301 to characterize the extent of trichloroethene impact may function appropriately as AZPOC monitoring wells, allowing one cohesive remedy to be in place at the Landfill.

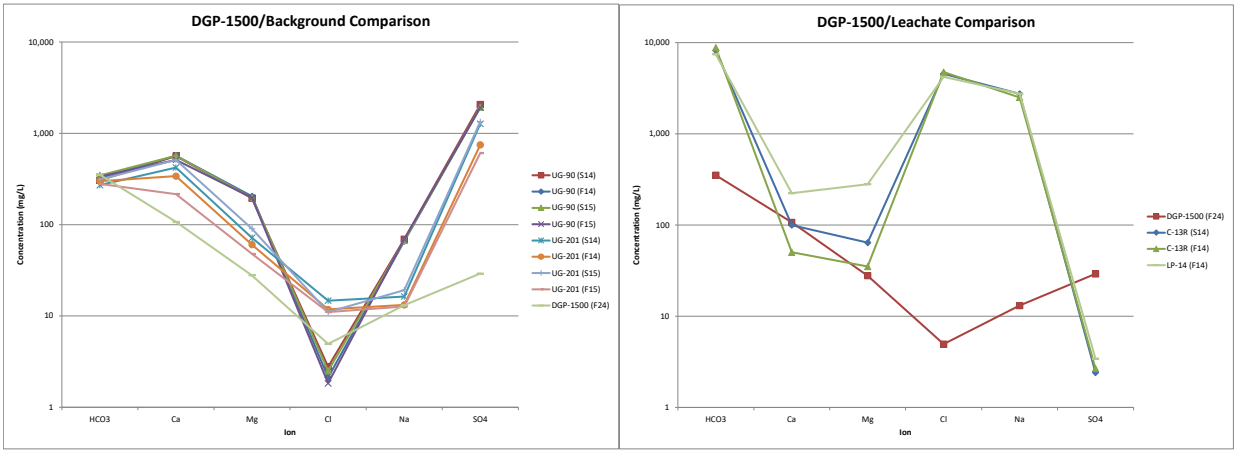
Geochemistry

Geochemical data was collected from monitoring well DGP-1500 during the fall 2024 sampling event and compared to previous data collected from the Landfill groundwater monitoring network to evaluate the potential source of impact as being from leachate migration, landfill gas migration, a combination of leachate and landfill gas, or from a non-landfill source. The data was evaluated using Tickell and Schoeller plots to compare the geochemical signature from DGP-1500 to both leachate (C-13R and LP-14) and background signatures (UG-90 and UG-201) previously collected. The plots are below and larger versions are included in Attachment A.

Tickell



Schoeller



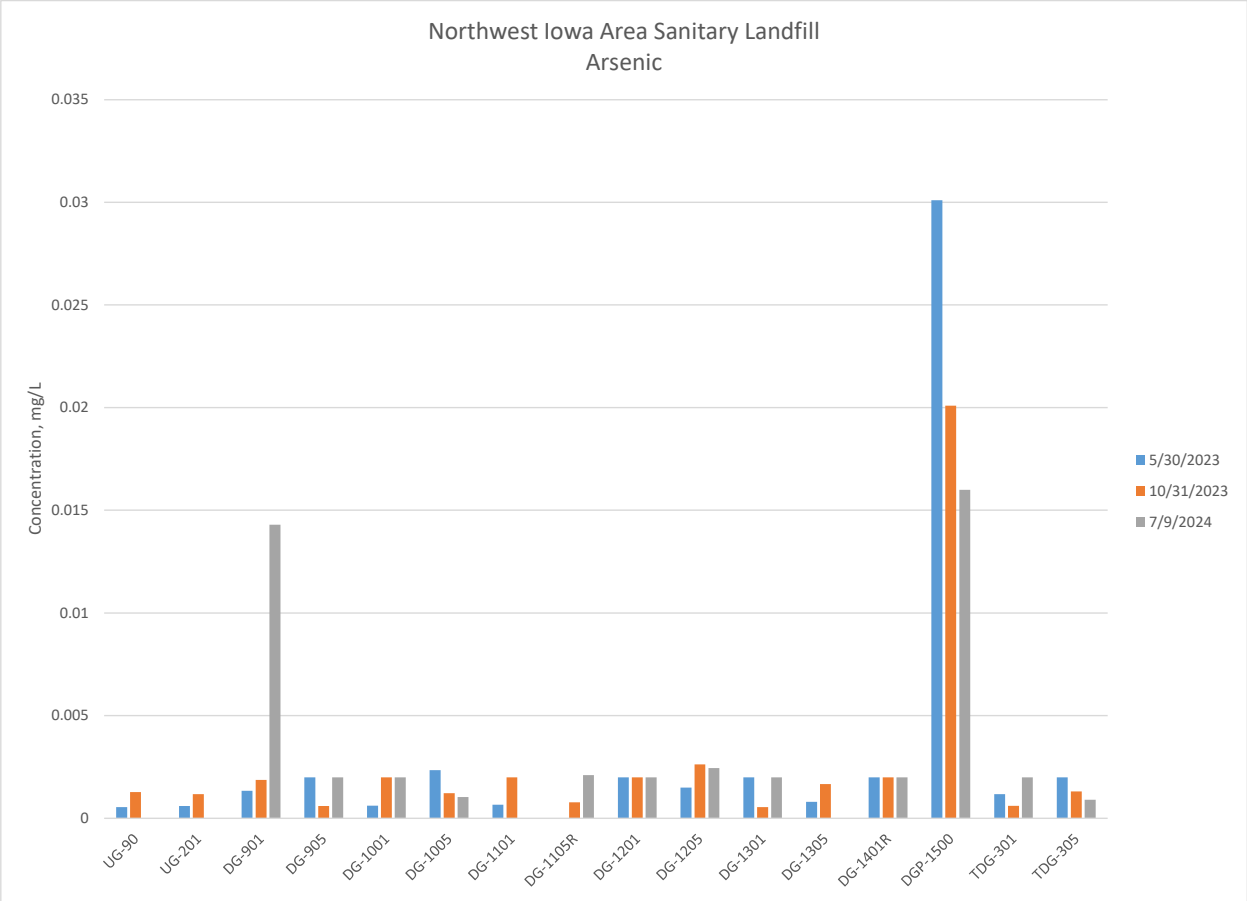
The geochemical signature of DGP-1500 does not resemble the signatures at the Landfill. The DGP-1500 signature does not resemble the background signatures, which contain significant sulfate

concentrations. They also do not resemble leachate, especially evidenced by the low chloride concentration measured in DGP-1500. The impact at DGP-1500 does not appear to be leachate and has only a slight indication of being landfill gas.

To determine the likely source of the impact, additional geochemical data will be collected from monitoring well DGP-1500 and monitoring wells DG-901, MW-P1, DG-1001, DG-1005, and DG-1101. Previously collected data for background and leachate signatures is likely sufficient for the geochemical comparisons.

Arsenic

The prevalence of arsenic in the monitoring wells at the Landfill measured during the May and October 2023 and July 2024 sampling events were graphed as shown below.



It is clear from the graph above that arsenic concentrations measured in DGP-1500 are several times higher than the rest of the monitoring network. The only exception is the July 2024 concentration measured in monitoring well DG-901, which was possibly influenced by an elevated total suspended solids (TSS) concentration (45 mg/L TSS was the highest concentration measured in the monitoring well since 2016). The majority of concentrations site-wide were non-detect or J flag concentrations.

The significantly higher arsenic concentrations in DGP-1500 compared to the rest of the monitoring network may indicate an explanation for the measured concentrations other than a release from the Landfill. One possible explanation could be a change in reduction-oxidation potential due to the leachate lagoon liner.

Monitoring well DGP-1500 is located downgradient of the leachate lagoon constructed in 2012. The liner of the leachate lagoon limits infiltration to the subsurface, potentially leading to anaerobic reducing conditions. The reduced form of arsenic, arsenite (As(III)), is significantly more soluble than arsenate (As(V)), making it more likely to be measured in the groundwater.

To evaluate the potential impact of arsenic valence states on the measured concentrations of arsenic in monitoring well DGP-1500, arsenic speciation analysis will be performed in DGP-1500.

In accordance with the 180-day timeframe specified by IAC 567-113.10(7)*a*, the due date for the ACM report is April 23, 2025. The sampling and analysis indicated above, including natural attenuation, geochemistry, and arsenic speciation, will be performed during the 2025 semi-annual sampling events. Therefore, it is requested that a submittal date of June 30, 2026, be established for the ACM report for the Landfill.

If you have any questions regarding this request, please contact Nathan Ohrt at (319) 331-9613 or Tim Buelow at (515) 681-5455.

Sincerely,

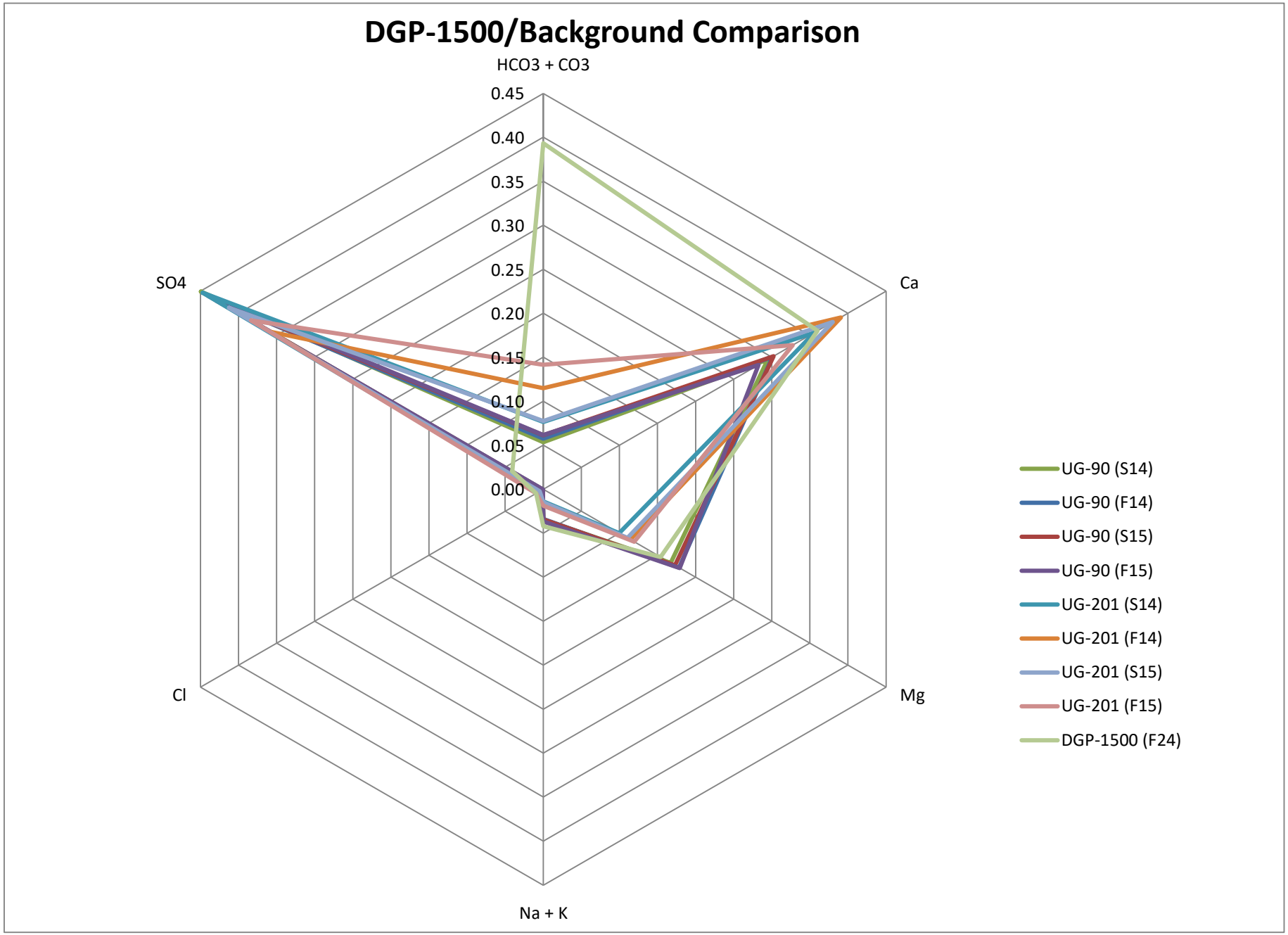
Nathan Ohrt
Senior Project Professional
SCS Engineers

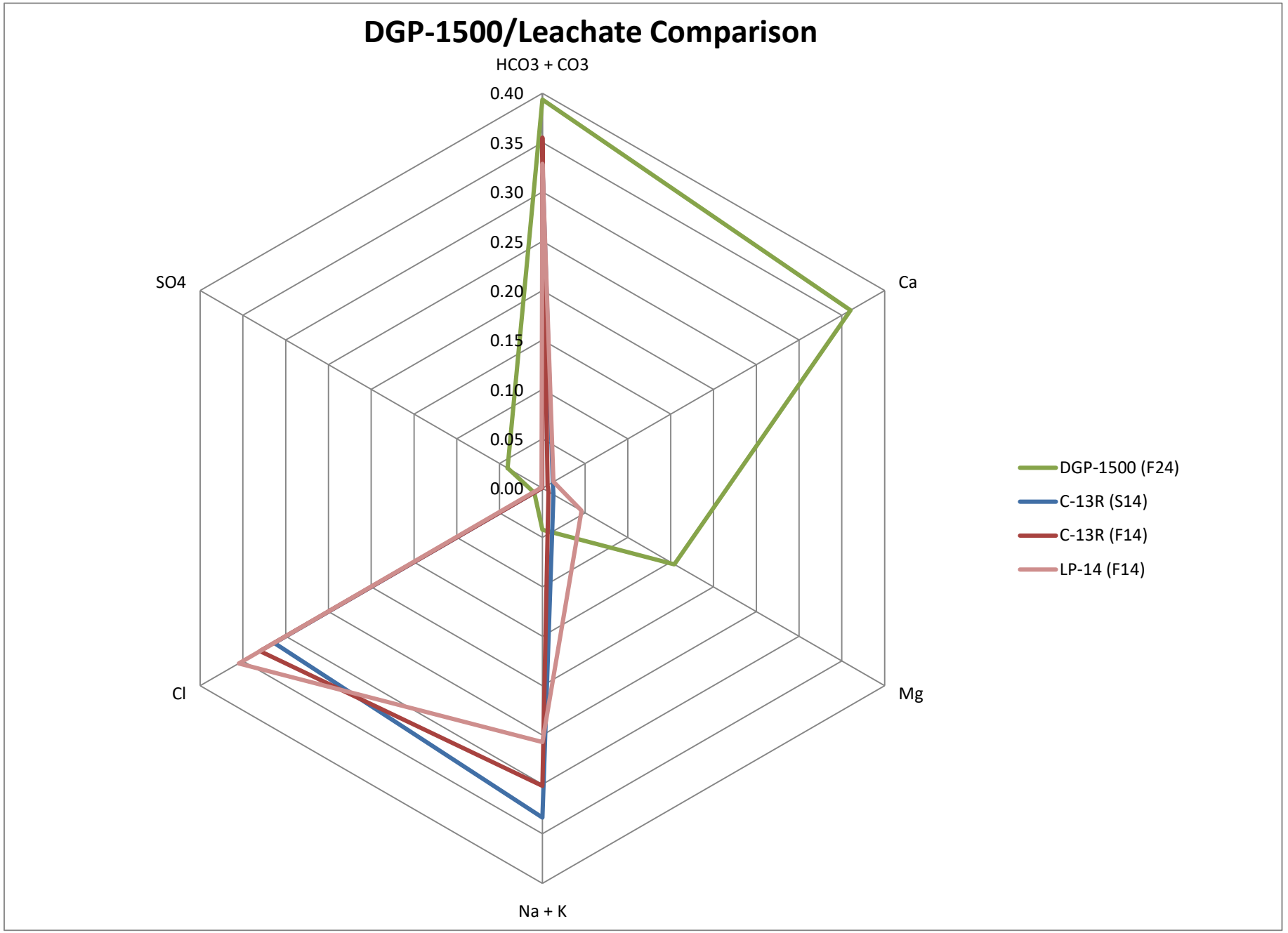
Timothy C. Buelow, P.E.
Senior Project Advisor
SCS Engineers

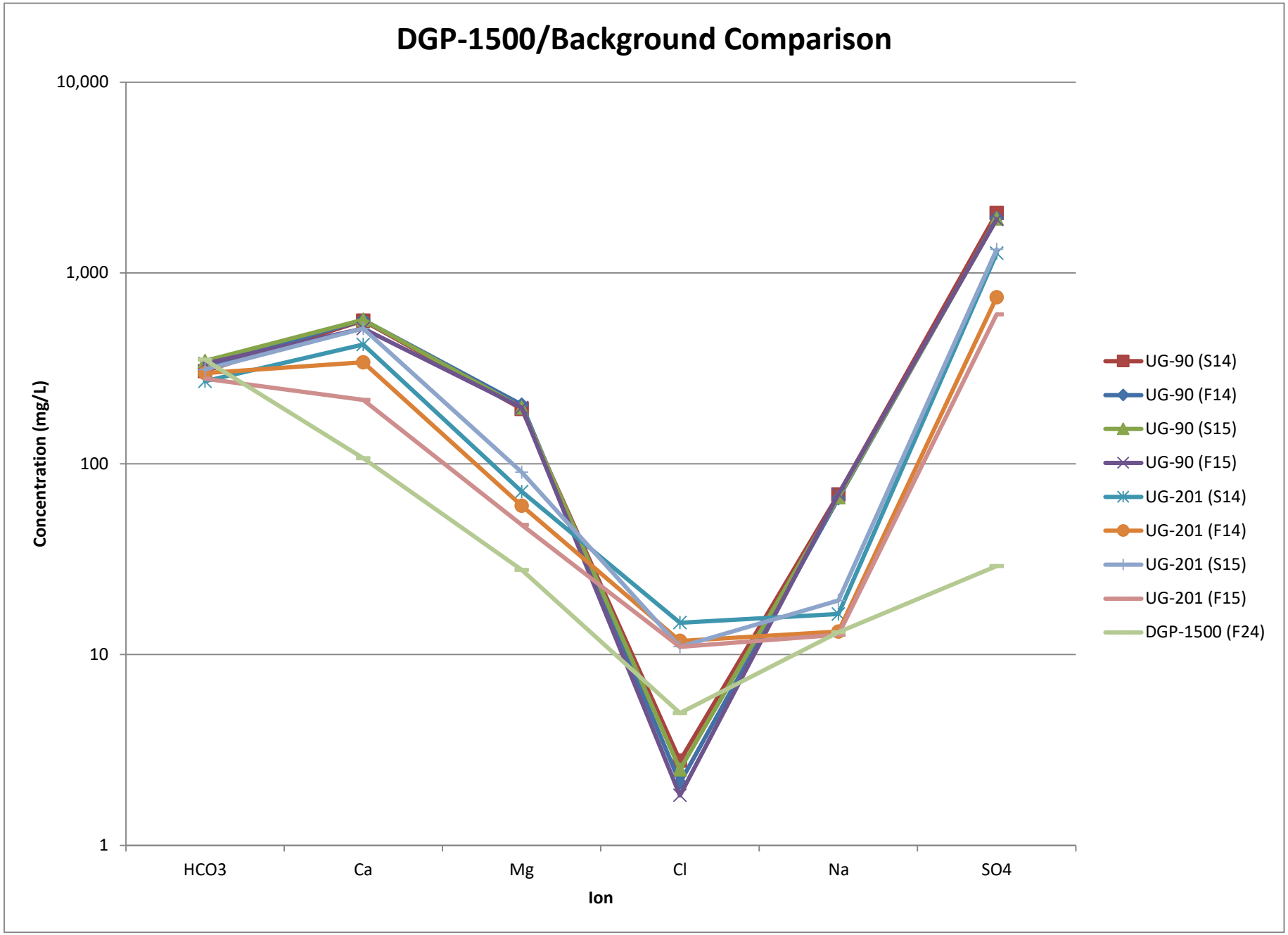
NPO/TCB

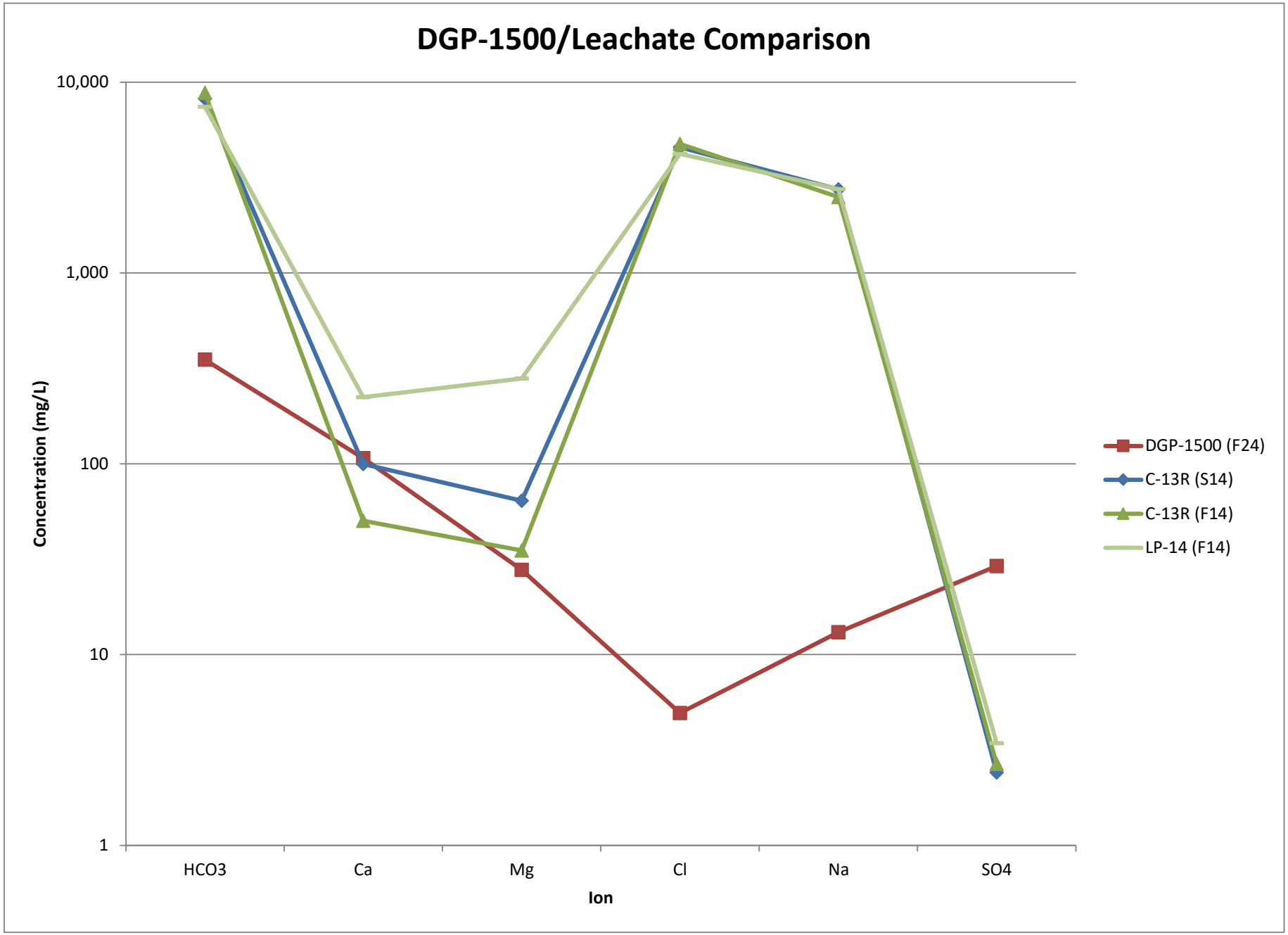
Copies: Mr. Brent Kach, Northwest Iowa Area Sanitary Landfill

Attachment A


DGP-1500/Background Comparison
HCO3 + CO3
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Ca
Mg
Na + K
Cl
SO4
UG-90 (S14)
UG-90 (F14)
UG-90 (S15)
UG-90 (F15)
UG-201 (S14)
UG-201 (F14)
UG-201 (S15)
UG-201 (F15)
DGP-1500 (F24)


DGP-1500/Leachate Comparison
HCO3 + CO3
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Ca
Mg
Na + K
Cl
SO4
DGP-1500 (F24)
C-13R (S14)
C-13R (F14)
LP-14 (F14)


DGP-1500/Background Comparison
10,000
1,000
100
10
1
Concentration (mg/L)
HCO3
Ca
Mg
Cl
Na
SO4
Ion
UG-90 (S14)
UG-90 (F14)
UG-90 (S15)
UG-90 (F15)
UG-201 (S14)
UG-201 (F14)
UG-201 (S15)
UG-201 (F15)
DGP-1500 (F24)


DGP-1500/Leachate Comparison
10,000
1,000
100
10
1
Concentration (mg/L)
HCO3
Ca
Mg
Cl
Na
SO4
Ion
DGP-1500 (F24)
C-13R (S14)
C-13R (F14)
LP-14 (F14)