FINAL REPORT

Electrokinetically-Delivered, Thermally-Activated Persulfate Oxidation (EK-TAP) for the Remediation of Chlorinated and Recalcitrant Compounds in Heterogeneous and Low Permeability Source Zones

ESTCP Project ER-201626

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ACRONYMS AND ABBREVIATIONS

AC A	alternating current amp
CHP	catalyzed hydrogen peroxide
cm/day	centimeters per day
cm/s	centimeters per second
CVOCs	chlorinated volatile organic compounds
cDCE	cis-1,2-dichloroethene
°C	degrees Celsius
Dem/Val	Demonstration/Validation
DoD	Department of Defense
DC	direct-current
DO	dissolved oxygen
DPT	direct push technology
EC	electrical conductivity
ERH	electrical resistance heating
EK	electrokinetic
EK-BIO	EK-enhanced amendment delivery for in-situ bioremediation
EK-TAP	electrokinetically delivered, thermally-activated persulfate
Keo	electroosmotic permeability
ERDC	Engineer Research & Development Center
ft	foot (or feet)
ft bgs	feet below ground surface
FDEP	Florida Department of Environmental Protection
gpm	gallons per minute
g/L	grams per liter
Kh	hydraulic conductivity
ISB	in-situ bioremediation
ISCO	in-situ chemical oxidation
kW-hr	kilowatt-hour
LTI	Lost-Time Incident
LDPE	low-density polyethylene
low-K	low-permeability
MS/MSD	matrix spike/matrix spike duplicate
µg/L	microgram per liter

mV	millivolts
MMO	mixed metal oxide
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command Southeast
OU3	Operable Unit 3
O&M	operation and maintenance
ORP	oxidation-reduction potential
PID	photoionization detector
PVC	Polyvinyl chloride
lbs	pounds
PLC	programmable logic controller
ROI	radius of influence
Eo	redox potential
$m^2/s-V$	square meters per second-volt
TTA	target treatment area
TTI	target treatment interval
PCE	tetrachloroethene
TCE	trichloroethene
TOC	total organic carbon
UIC	underground injection control
USACE	United States Army Corps of Engineers
VC	vinyl chloride
V	volts
V/cm	volts per centimeter
V/m	Volts per meter
W	watt
ZVI	zero-valent iron

ABSTRACT

INTRODUCTION AND OBJECTIVES

This Demonstration/Validation (Dem/Val) project was conducted at Naval Air Station (NAS) Jacksonville, Florida (the Site) to assess and validate the performance of an electrokinetic (EK) technique to promote uniform and effective distribution of persulfate in low-permeability (low-K) and heterogeneous subsurface materials, for the purposes of improving site remediation at low-K sites.

TECHNOLOGY DESCRIPTION

The electrokinetically delivered, thermally-activated persulfate (EK-TAP) technology consists of two main components: i) delivery of persulfate through low-K and heterogeneous soils using direct current (DC); followed by ii) heat activation of the persulfate, by raising the temperature of the soil and pore water by electrical resistance heating (ERH) using alternating current (AC).

PERFORMANCE AND COST ASSESSMENT

A phased testing approach was planned for the Dem/Val but unfortunately, due to federal budget constraints, only the technical objectives associated with the first phase of testing (i.e., Phase 1 dipole test to distribute persulfate within the clay unit at the Site) were assessed. These were i) demonstrating uniform distribution of persulfate; ii) quantification of EK system operational parameters; and iii) demonstrating safety, reliability, and ease of technology implementation. Each of the technical objectives were achieved, and the Dem/Val showed that EK can achieve relatively uniform transport of persulfate in low-K materials, which is a critical and distinct advantage of the EK technology over other conventional advective flow-based approaches. EK-enhanced delivery is a safe and relatively more controllable approach compared to high-pressure/fracturing injection and thermal approaches, and the EK technology also represents a remedial alternative with excellent environmental performance. The duration of the Phase 1 dipole test ran for several months longer than anticipated due to a disruption in the supply of the potassium bicarbonate pH buffer, which impacted system uptime. However, once the supply of this pH buffer was restored system uptime recovered and was maintained through the end of the test.

Based on the information and experience obtained from this Dem/Val, there are three main cost drivers to consider when evaluating implementation costs in future projects, including: (i) footprint, depth interval, and volume of target treatment zone and contaminant mass; (ii) presence and location of above-ground and subsurface utilities; and (iii) site geochemistry, particularly pH and iron. A cost comparison was developed and showed that EK-TAP can be potentially more cost favorable to ERH, and that the EK-TAP approach is slightly more cost favorable to direct-injection in-situ chemical oxidation (ISCO) and fracturing enhanced zero-valent iron (ZVI) direct injection. Thus, at sites where low-K material and/or high-degree of heterogeneity likely preclude the consideration for direct injection, EK-TAP provides a cost-effective solution for implementing ISCO using persulfate.

IMPLEMENTATION ISSUES

When considering the use of EK-TAP at a site, additional attention may be required concerning electrical safety, elevated concentrations of iron in the treatment zone, corrosion of wetted metallic components, potential regulatory limitations for pH control amendments, cathodic protection measures when implementing the technology near "sensitive" utilities, and informing local and facility departments about the proposed remedy.

PUBLICATIONS

No publications were made during this Dem/Val.

EXECUTIVE SUMMARY

INTRODUCTION AND OBJECTIVES

This Demonstration/Validation (Dem/Val) project was conducted at Naval Air Station (NAS) Jacksonville, Florida (the Site) to assess and validate the performance of an electrokinetic (EK) technique to promote uniform and effective distribution of persulfate in low-permeability (low-K) and heterogeneous subsurface materials, for the purposes of improving site remediation at low-K sites. Recent advances in the understanding of mass distribution in subsurface environments has highlighted that in many cases a significant portion of the source mass is held in storage in low-K materials. The main limitation of current in-situ remediation applications in low-K materials using conventional hydraulic recirculation or injection techniques is the inability to effectively deliver the required amendments to the target contaminant mass.

TECHNOLOGY DESCRIPTION

The electrokinetically delivered, thermally-activated persulfate (EK-TAP) technology consists of two main components: i) delivery of persulfate through low-K and heterogeneous soils using EK processes; followed by ii) heat activation of the persulfate, by raising the temperature of the soil and pore water through low intensity thermal treatment, to promote in-situ oxidation of the target contaminants (Figure ES-1). With EK-TAP, the same infrastructure can be used for both EK distribution of persulfate using direct current (DC) and soil heating by electrical resistance heating (ERH) using alternating current (AC). The electrical current and voltage gradient established across a DC electric field provide the driving force to transport remediation amendments, such as persulfate, through the subsurface.



Figure ES-1. Schematic of EK-Enhanced Amendment Delivery Technology

The Dem/Val system consisted of three (3) electrode wells, four (4) supply wells, and four (4) performance monitoring wells located within the target treatment area (TTA) at the Site (Figure ES-2). Baseline soil characterization was performed during installation of select wells, and baseline groundwater characterization was performed following installation of the monitoring wells. Following system construction and startup, system operations were initiated and lasted for approximately 7 months. Performance monitoring groundwater sampling was performed throughout system operations.



Figure ES-2. EK-TAP System Infrastructure for Dem/Val

PERFORMANCE ASSESSMENT

A phased testing approach was planned for the Dem/Val. The first phase of testing (i.e., Phase 1 dipole test) was designed to assess the applicability of EK to migrate persulfate within the clay unit using DC power. The second phase of testing (i.e., Phase 2 heating and persulfate activation) was designed to assess the ability of the system components to heat the subsurface (using AC power) to the activation temperature of persulfate, and then evaluate treatment of the target contaminants (chlorinated volatile organic compounds [CVOCs]) following heat activation of the distributed persulfate. Unfortunately, due to federal budget constraints, the second phase of the Dem/Val was not performed. As a result, only the technical objectives associated with the Phase 1 dipole test were assessed based on the performance monitoring data collected. These were:

I. Demonstrate uniform distribution of persulfate.

This Dem/Val met this objective by achieving the success criteria, including:

- Detection of persulfate at all four monitoring locations within the TTA at the end of Phase 1 operations at concentrations ranging from 1% to 100% of the amendment supply concentration; and
- No local focusing of the electric field was observed within the TTA.

II. Quantification of EK system operational parameters.

This Dem/Val met this objective by achieving the success criteria, including:

- System operational conditions (voltage and current) were maintained within ± 50% of the designed target conditions;
- Amendment supply uptime was >75% of target;
- Energy consumption was within \pm 30% of design estimates; and,
- Electrode function was maintained throughout system operations.

III. Demonstrate safety, reliability, and ease of technology implementation.

This Dem/Val met this objective by achieving the success criteria, including:

- System operational conditions remained relatively steady over the course of the Dem/Val and there were no safety related lost-time incidents;
- The Dem/Val involved only conventional field construction techniques and contractors, and routine system operations were effectively monitored by a single field technician.

This Dem/Val showed that a critical and distinct advantage of EK-enhanced amendment delivery over other conventional advective flow-based approaches is that EK can achieve relatively uniform transport of persulfate in low-K materials. EK-enhanced delivery is a safe and relatively more controllable approach compared to high-pressure/fracturing injection and thermal approaches. This technology also represents a remedial alternative with excellent environmental performance. The electrical energy consumed during the active EK operation period in this Dem/Val was equivalent to operating a single 100-W lightbulb for approximately 6 months.

The duration of the Phase 1 dipole test was longer than anticipated due to a disruption in the supply of the potassium bicarbonate pH buffer, which had a significant impact on system uptime. An alternate pH buffer (potassium carbonate) was used during this period but was not as effective at controlling pH within the electrode wells as the potassium bicarbonate. Once the supply of potassium bicarbonate was restored, system uptime recovered and was maintained through the end of the Phase 1 dipole test.

COST ASSESSMENT

Based on the information and experience obtained from this Dem/Val, there are three main cost drivers to consider when evaluating implementation costs in future projects, including: (i) footprint, depth interval, and volume of target treatment zone and contaminant mass; (ii) presence and location of above-ground and subsurface utilities; and (iii) site geochemistry, particularly pH and iron.

These are also the same cost drivers for many other in-situ remediation technologies and not unique to EK technology implementation.

A cost comparison was developed and showed that EK-TAP could be potentially more cost favorable to an in-situ thermal treatment using electrical resistance heating (ERH). The energy usage required for EK-TAP is significantly less than the energy usage required for ERH, resulting in a much more favorable environmental performance of EK-TAP over ERH. The cost comparison also showed that the EK-TAP approach is slightly more cost favorable to direct-injection in-situ chemical oxidation (ISCO) and fracturing enhanced zero-valent iron (ZVI) direct injection. Thus, at sites where low-K material and/or high-degree of heterogeneity likely preclude the consideration for direct injection, EK-TAP provides a cost-effective solution for implementing ISCO using persulfate.

IMPLEMENTATION ISSUES

While EK-TAP is mainly a variation on standard ISCO using persulfate, whereby EK is used to more effectively deliver the persulfate through low-K materials, and then the same infrastructure is used to heat the treatment zone (similar to ERH) and activate the persulfate, some areas where additional attention beyond those typically considered for ISCO and ERH may be required on a site-specific basis, including:

- Safety considerations related to potential stray current/voltage to surface. To address this question, the current and voltage at surface steel structures located within the TTA were measured during system operations to confirm that there was no safety concern. Depending on the project site, and for sensitive and active facilities with dedicated safety departments, additional design and explanation effort may be required for project approvals.
- Iron fouling of filters and valves along the extraction piping. During this Dem/Val, minimal fouling of filters and valves was observed, but routine maintenance was required to minimize potential flow restrictions within the conveyance lines. Scaling of the cathodes also required maintenance actions to clean the cathode surface. The presence of iron within the target treatment zone resulted in activation of the persulfate which reduced the persulfate migration rate and extended the duration of operations. However, activation of the persulfate also resulted in some treatment of the target CVOCs, which could have reduced the effort required for a subsequent heating stage had heating been performed during the Dem/Val.
- Corrosion of wetted metallic parts in the manifold system and at wellhead fittings due to elevated chloride concentrations. Although not encountered during this Dem/Val, this can be mitigated by minimizing the amount of metallic wetted parts within the system and instead using components with plastic wetted parts.
- The technology implementation did not require specialized/proprietary equipment. We used only standard commercial off-the-shelf equipment. We designed the manifold and control system and had a remediation system vendor assemble the system per design, but the overall system was similar to other "typical" in-situ remediation systems. There were specific regulatory requirements regarding the chemical composition of the pH buffers used in this Dem/Val, but in our experience this was a unique situation and in most cases the requirements for addition of chemical amendments for an EK-TAP remedy should be similar to the requirements for other "typical" in-situ remediation technologies.

- If the technology is to be implemented near (laterally and/or vertically) utilities that are "sensitive" to electric interference or where there are concerns with corrosion, some protection measures, such as cathodic protection, may be considered.
- No special regulatory requirements or permits beyond what are typical for other ISCO projects such as UIC permit (other than perhaps limitations for the pH control amendments as noted above). Depending on the locality-/facility-specific requirements, local or facility power/electrical departments should be consulted, and local HazMat response departments should be informed about the use of a chemical oxidant at the project site.

1.0 INTRODUCTION

This Final Report summarizes the approach, methodology and results of a field Demonstration/ Validation (Dem/Val) project conducted to assess and validate the performance of an electrokinetic (EK) technique to promote uniform and effective distribution of persulfate in lowpermeability (low-K) and heterogeneous subsurface materials, for the purposes of improving site remediation at low-K sites. This project was conducted in collaboration with Naval Facilities Engineering Command Southeast (NAVFAC SE) and the United States Army Corps of Engineers (USACE) Engineer Research & Development Center (ERDC).

1.1 BACKGROUND

Decades of remediation experience have shown that in-situ remediation approaches are more successful and cost effective than most ex-situ remediation methods. However, in-situ remedies, such as in-situ chemical oxidation (ISCO) and in-situ bioremediation (ISB), while capable of treating various contaminants in permeable sandy aquifers, often fail to effectively target contaminants in silt and clay materials, or combinations of sand and low-K materials. Recent advances in the understanding of mass distribution in subsurface environments has highlighted that in many cases a significant portion of the source mass is held in storage in low-K materials, and that the release rate from low-K storage is many times slower than the original contaminant loading rate. The main limitation of in-situ remedy applications in low-K materials is the inability to effectively deliver the required amendments to the target contaminant mass contained within the low-K material using conventional hydraulic recirculation or injection techniques.

While hydraulic fracturing has shown some promise in improving amendment distribution in low-K materials, the success of this approach has been limited by site access constraints, surface structure impact concerns, high cost, and consistency and predictability of induced fractures. Other technologies such as large diameter auger mixing and thermal treatment have shown promise in low-K materials. However, these approaches have been expensive and are also limited by site access and re-use limitations. Conventional thermal remediation approaches also face the challenges of removing and treating gaseous phase contaminants. Lower cost, and ideally more environmentally-sustainable remediation approaches or improvements to existing technologies are required to reduce overall remediation costs at Department of Defense (DoD) and defense contractor sites.

The electrokinetically delivered, thermally-activated persulfate (EK-TAP) technology consists of two main components: i) delivery of persulfate through low-K and heterogeneous soils using EK processes; followed by ii) heat activation of the persulfate, by raising the temperature of the soil and pore water through low intensity thermal treatment, to promote in-situ oxidation of the target contaminants. With EK-TAP, the same infrastructure can be used for both EK distribution of persulfate using direct current (DC) and soil heating by electrical resistance heating (ERH) using alternating current (AC). The electrical current and voltage gradient established across a DC electric field provide the driving force to transport remediation amendments, such as persulfate, through the subsurface. One reason why EK represents a fundamentally more effective delivery technique compared to an advective hydraulic approach is the relatively uniform electrical property of various soil materials. As a result, EK-enhanced amendment delivery technology can achieve effective and uniform amendment distribution at sites where heterogeneous subsurface materials often limit the applications of hydraulic methods.

1.2 OBJECTIVE OF THE DEMONSTRATION

As stated in the Technology Demonstration Plan (Geosyntec, 2019b), the overall goal of this project was to demonstrate and validate the EK-TAP technology to promote in-situ oxidation of chlorinated solvents in complex heterogeneous and low-K geological materials. Unfortunately, due to federal budget constraints, the second phase of the Dem/Val (i.e., Phase 2 heating and persulfate activation) was not performed. As a result, only the technical objectives associated with the first phase of testing (i.e., Phase 1 dipole test to distribute persulfate within a low-K unit using DC) were assessed. These include:

- i) Demonstration and quantification of the ability to uniformly distribute persulfate throughout a low-K and/or heterogeneous target treatment area (TTA) using a *DC* electric field.
- ii) Quantification of EK system operational parameters to develop tools for full-scale system design and optimization; and
- iii) Demonstrate the safety, reliability, and ease of technology implementation.

1.3 REGULATORY DRIVERS

In 2011, a SERDP/ESTCP-sponsored workshop on *Investment Strategies to Optimize Research and Demonstration Impacts in Support of DoD Restoration Goals* identified treatment of contaminants in low-K subsurface materials (i.e. silts, clays, and bedrock) as a high-priority area for additional investment. The workshop participants pointed out that treatment of low-K zones would require adoption of effective and cost-effective techniques that can target delivery of remedial agents to these regions and prevent continued back-diffusion of contaminants.

Estimated costs to DoD for adopting hydraulic containment at more than 3,000 chlorinated hydrocarbon sites could surpass \$100 million annually, with estimated life-cycle costs of more than \$2 billion (SERDP/ESTCP, 2006). ISCO is generally considered to be an effective remedial option for chlorinated solvent sites and is widely used by DoD and remediation practitioners. Improved delivery and activation of chemical oxidants will accelerate ISCO and thereby reduce the overall cost of remediation at many of these sites, particularly at those that have low-K zones or heterogeneous materials, while avoiding the high energy and vapor treatment costs associated with traditional thermal remedies. This will broaden the application of ISCO at more DoD sites where subsurface conditions may have previously precluded the use of ISCO.

2.0 TECHNOLOGY DESCRIPTION

This section provides an overview of persulfate oxidation for remediation of chlorinated solvents, the use of EK techniques to deliver oxidants through low permeability subsurface materials, and the use of EK-TAP. Advantages and potential limitations associated with this technology are also discussed.

2.1 PERSULFATE OXIDATION

Various oxidants have been used in laboratory and field applications to aggressively destroy organic chemicals, including Fenton's reagent (or more generally known as catalyzed hydrogen peroxide [CHP]), permanganate, persulfate, ozone, and ozone combined with peroxide. These oxidants react to varying degrees with organic contaminants, converting them into innocuous end products such as carbon dioxide, water, and inorganic chloride. Because not all ISCO treatments are applicable for all organic contaminants and all geochemical conditions, site contaminants of concern and conditions must be understood to choose the appropriate oxidant and delivery method. The treatment effectiveness of chemical oxidants currently in use varies based on several factors, including the redox potential (E°) of the oxidant, and the reactive specificity of the oxidant toward a given type of contaminant.

Activated persulfate has been demonstrated to be a very effective and powerful (E° of -2.1 volts [V]) oxidant for many recalcitrant contaminants such as chlorinated solvents. The most common form of persulfate used in remediation is sodium persulfate. Activation of persulfate to generate sulfate radicals can dramatically increase the oxidative strength of this oxidant ($E^{\circ} = -2.6$ V). Activation of persulfate is typically achieved using heat, base activation (pH ~12), addition of peroxide, or addition of a suitable reductant, such as ferrous iron. Persulfate has been demonstrated to treat a broad array of organic contaminants in groundwater and is relatively persistent in comparison to some other strong oxidants such as CHP and ozone. As mentioned in Section 1.1, a common challenge at many sites with low-K soils is the ability to effectively deliver and activate persulfate to achieve successful treatment of the target contaminants. Oxidants such as CHP and ozone are typically short-lived in the subsurface, and in low permeability materials it is typically difficult to effectively distribute them before they react. In comparison, persulfate is slower to react, thereby allowing it to be distributed much farther through the subsurface and through low-K materials.

2.1.1 EK-Enhanced Amendment Delivery

The EK-enhanced amendment delivery technology entails the use of electrodes and DC electrical power to establish an electric field in the subsurface. The voltage gradient established across the DC electric field is the driving force for transporting remediation reagents, including chemical oxidants for ISCO or electron donors and/or microorganisms for ISB, through low-K soils or uniformly through heterogeneous formations. The EK transport process relies primarily on two mechanisms which occur with the application of the electric field:

• *Electromigration* (*or ion migration*) – the movement of charged dissolved ions through an aqueous medium in response to the applied electric field. The direction of ion migration is toward the electrode with a polarity opposite of the ion's charge; and

• *Electroosmosis* – the movement of pore fluid (and dissolved constituents) within a porous medium in response to the applied electric field. The direction of electroosmotic flow is usually from the anode toward the cathode.

One reason why EK represents a fundamentally more effective delivery technique in low-K materials compared to an advective hydraulic approach is the relatively uniform electrical property of various soil materials. For example, while the hydraulic conductivity (K_h) of fine sand and kaolin materials can vary by several orders of magnitude, the coefficient of electroosmotic permeability (K_{eo}) of fine sand (4x10⁻⁹ square meters per second-volt [m²/s-V]) is comparable to that of kaolin ($5.7x10^{-9}$ m²/s-V) and clayey till ($5.0x10^{-9}$ m²/s-V), as shown in **Figure 2-1**. Therefore, the EK-enhanced amendment delivery technology can achieve effective and uniform amendment distribution at sites where heterogeneous subsurface materials often limit the applications of hydraulic methods.



Figure 2-1. Hydraulic and Electrical Properties of Various Soils (rev. Mitchell, 1993)

The application of electric current will also result in electrolytic reactions at the electrodes. If inert electrodes (such as graphite or ceramic-coated electrodes) are used, water oxidation produces oxygen gas and acid (H_3O^+) at the anode (positively charged electrode), while water reduction produces hydrogen gas and base (OH-) at the cathode (negatively charged electrode). Electrolytic reactions of water are shown below in Equations 1 and 2,

$$2H_2O = 4e^- + 4H^+ + O_2 \quad (at Anode) \quad (1)$$

$$2H_2O + 2e^- \implies 2OH^- + H_2 \qquad (at Cathode) \qquad (2)$$

Faraday's law for equivalence of mass and charge can be used to calculate the rate of redox reactions that will occur at the electrodes (Koryta and Dvorak, 1987). Therefore, it is possible to engineer and control the electrolytic processes at the electrodes to produce hydrogen (H₂) and oxygen (O₂) or to control pH conditions, depending on the system design objectives.

To implement the EK-enhanced delivery technology in the field, remediation amendments are added to supply wells located intermediary to the electrode wells, mainly to shorten amendment travel distance versus consumption rate (**Figure 2-2**). Electrodes of selected inert materials are installed in electrode wells and connected to a *DC* power source. The power supply unit will supply electrical energy to the electrodes at designed settings of voltage and/or current. The electrical field will transport the amendments from the supply wells into and through the formation materials to achieve relatively uniform transport and distribution. Cross-circulation and/or pH-balancing can be employed at the electrode wells to overcome the effects of water electrolysis and retain the natural in-situ pH of the system (as required). Slight subsurface heating may occur with application of the electrical field. However, results from field trials have shown that temperature increases are minor (less than 10 degrees Celsius [°C]).





2.2 TECHNOLOGY DEVELOPMENT

Results from many studies conducted at both bench-scale and field-pilot scale have shown the potential of EK-enhanced amendment transport (Mao et al., 2012; Gent, 2001; Wu et al., 2007; Reynolds et al., 2008; Hodges et al., 2011; SERDP ER-1204). Bench-scale studies conducted at ERDC effectively delivered acetate through loess soil ($K_h = 10^{-7}$ centimeters per second [cm/s]) and vertically deposited clay ($K_h = 10^{-9}$ cm/s) at rates of 2.1 and 2.5 centimeters per day (cm/day), respectively, with a voltage gradient near 0.5 volts per centimeter (V/cm) (Gent, 2001). An average lactate transport rate of 3.4 cm/day under a unit voltage gradient of 1 V/cm was achieved in a bench-scale study conducted using a silty clay ($K_h = 10^{-7}$ cm/s) (SERDP ER-1204).

The observed EK-enhanced transport rate in that SERDP study was more than 120 times higher than the transport rate achievable in the same type of soil but under a unit hydraulic gradient. Geosyntec Consultants, Inc. (Geosyntec), in collaboration with ERDC, completed a field pilot test of EK-enhanced amendment delivery for in-situ bioremediation (EK-BIO) at a site in Denmark, which achieved a lactate transport rate between 2.5 and 5 cm/day through clay materials. Results from the recently completed EK-BIO Dem/Val at Naval Air Station (NAS) Jacksonville (ESTCP Project ER-201325) showed that EK was effective at uniformly distributing lactate throughout the target treatment area of a clay unit.

The use of EK-enhancement for ISCO has also been demonstrated at the bench scale in both column and sandbox experiments (Roach et al., 2006; Reynolds et al., 2008; Robertson, 2009; Hodges et al., 2011; Fan et al., 2014, 2016; Chowdhury et al., 2017). Common oxidants such as permanganate and persulfate are charged compounds and will migrate under the driving force of the imposed electric gradient. Migration rates of mono-valent and divalent oxidants have been measured in the laboratory at levels in excess of 500 times higher than that achievable through diffusion alone. In persulfate and permanganate migration column studies performed by Geosyntec using low-K soils from various sites in the United States and Denmark, estimates of persulfate and permanganate transport rates ranged from approximately 1 to 12 cm/day. Geosyntec has also completed several field pilot tests of EK-TAP (i.e., using persulfate as the oxidant) and EK-ISCO (i.e., using permanganate as the oxidant) at sites in California, Louisiana, North Carolina, Ontario Canada (Head et al., 2020), and Denmark, which achieved persulfate or permanganate transport rates between 1 and 4 cm/day through low-K soils (typically clays or silty clays). Results from most of these pilot tests indicated general uniformity of distribution of persulfate or permanganate as well as some destruction of target contaminants (primarily chlorinated volatile organic compounds [CVOCs]) within the low-K target treatment units.

The EK-TAP technology is a two-step process that uses the same infrastructure to first deliver the persulfate through the low-K target treatment area by applying DC power, followed by heating of the soils to 30°C to 40°C by AC electricity via the electrodes to activate the persulfate (to increase its reaction rate). The application of AC through the subsurface is the basis of thermal treatment by ERH. Persulfate reaction rates increase substantially with temperature, increasing by up to two orders of magnitude with an increase in temperature from 20°C to 40°C.

The traditional resistance heating approach for remediation consists of applying AC to heat the subsurface to near boiling temperatures that promote volatilization of contaminants which are subsequently captured by a subsurface vapor recovery system and conveyed to the surface for treatment. For the EK-TAP process, soil heating is used to moderately elevate the subsurface temperature only to the level where persulfate reaction kinetics are increased (i.e., 30°C to 40°C). This increase in temperature does not result in the creation of a vapor phase and volatilization of contaminants, which greatly decreases the required infrastructure as compared to traditional resistance heating applications (since the EK-TAP infrastructure requirements are limited to temperature monitoring and an AC power source) and results in destruction of contaminants insitu, without the need for expensive vapor capture and ex-situ treatment. The combination of EK and soil heating is particularly suited to low-K sites, overcoming the high energy costs and long duration of the heating phase, and removing the need for high pressure injections or fracking to achieve contact of the oxidant with the contaminants within the low-K soils.

2.3 ADVANTAGES AND LIMITATIONS OF THE TECHNOLOGY

A critical and distinct advantage of the EK technology over most other approaches is that EK can achieve relatively uniform transport in inter-bedded clays and sands, even when the hydraulic conductivities of the subsurface materials vary by orders of magnitude. EK-enhanced transport, which relies primarily on the electrical properties of aquifer materials instead of the hydraulic properties, represents a solution to the limitations of preferential pathways facing conventional advective-based hydraulic technologies.

EK-enhanced delivery is a safer, and more controllable approach compared to current highpressure/fracturing injection and thermal approaches. The migration of remediation reagents is directed by the electrical field established between electrodes, and no high injection pressures are involved.

EK-enhanced delivery also represents a remediation technology with good environmental performance. Unlike other technologies that repeatedly deliver/flush amendments through a small number of preferential pathways in the subsurface, the EK technology can uniformly deliver the amendments, maximizing treatment effectiveness and reducing treatment cost and duration. In the case of EK-TAP, direct treatment and destruction of target contaminants in-situ can also be achieved, instead of transferring contaminants to the gas phase which requires additional containment/collection and treatment. The electrical energy usage of EK-TAP is relatively low compared to current thermal remediation technologies. The EK-TAP field pilot tests conducted by Geosyntec at other sites required less than 100V and 15 amps (A) of electrical power to sustain the EK operation. The energy usage of the EK-TAP pilot tests was equivalent to the energy needed to power approximately ten 100-watt (W) light bulbs, reflecting the small carbon footprint and excellent environmental performance of this technology.

Although conceptually there is no depth limit for this technology, applications of EK-enhanced delivery and EK-TAP in areas with subsurface metallic infrastructure will require considerations for infrastructure protection. Grounding protection of subsurface utilities as needed is a common practice for many electrical engineering projects.

There are several aspects of this technology that will require appropriate considerations and control measures, including:

- Safety considerations related to potential stray current/voltage to ground surface.
- If the technology is to be implemented near (laterally and/or vertically) utilities that are sensitive to electric interference or corrosion concerns, some protection measures, such as cathodic (grounding) protection, may be required. Depending on the locality/facility-specific requirements, local or facility power/electrical departments should be consulted, and local HazMat departments should be informed about the use of chemical oxidants at the project site.
- Although conceptually there is no depth limit for this technology, shallow treatment zones too close to the ground surface and/or utilities, or in a vadose zone, can limit the feasibility of this technology.

- Certain site hydrogeology or geochemical conditions may limit the applications or impact the costs of this technology, including:
 - High levels of iron may result in activation of the persulfate which can lead to slower persulfate migration rates and extended remediation timeframes. However, in-situ activation of the persulfate can also result in treatment of target CVOCs which may preclude the need for activation of the persulfate via a subsequent heating stage and/or the need for a second treatment cycle.
 - High levels of iron and/or chloride that require particular engineering control measures (e.g., corrosion protection) or more operational maintenance efforts for fouling controls. Iron fouling is also a common challenge to other in-situ remediation technologies.
 - High levels of total organic carbon (TOC) that can exert a higher oxidant demand and increase the amount of persulfate required for subsequent treatment of target CVOCs. This limitation is not specific to EK amendment delivery, but instead is a limitation for ISCO remediation as a whole.
 - High natural groundwater flow velocity in the permeable portion of a target treatment zone may potentially limit the EK transport in the direction against the natural groundwater flow.

3.0 PERFORMANCE OBJECTIVES

Performance objectives for the Dem/Val were identified and approved by ESTCP to provide the basis for evaluating the performance and costs of the Dem/Val technology. As noted in Section 1.2, only the first phase of the Dem/Val was performed, and therefore only the performance objectives associated with this first phase of the Dem/Val were assessed. **Table 3-1** presents a summary of the quantitative and qualitative performance objectives that were assessed, which are further discussed in the following subsections.

Performance Objective	Data Requirements	Success Criteria	Assessment
Quantitative Perf	ormance Objectives		
Demonstration and quantification of the ability to uniformly distribute persulfate using a <i>DC</i> electric field	Monitoring of the concentrations of persulfate, sulfate, and total sulfur Monitoring of voltage and electrical current within the EK system during operation	 Evidence of persulfate transport to all monitoring wells located within the TTA following the EK migration phase Persulfate transport rate greater than 2.5 cm/day No focusing of electric field in any areas (electrical gradient between well pairs no more than 5x of average gradient between all well pairs) Electrical potential gradient between electrode pairs maintained at level no more than 5x of target gradient at design current 	Objective Met (see Section 3.1)
Quantification of EK system operational parameters	EK system operational parameters, amendment usage, and energy consumption	 System operational conditions (voltage, current) within ±50% of the final designed target voltage and current Persulfate supply uptime greater than 75% of target Energy consumption within +/-30% of design estimate Electrode function is maintained for at least one full cycle of EK-TAP 	Objective Met (see Section 3.2)
Qualitative Perform	rmance Objectives	· · · · ·	
Safe and reliable operation	Monitoring of system operational parameters	 Operation conditions remain stable within the normal designed ranges over the course of the demonstration period. No Lost-Time Incidents (LTIs) 	Objective Met (see Section 3.3)
Ease of implementation	Feedback from field personnel on installation and operation of technology and system	 Ability to construct using conventional techniques and contractors. A single field technician able to effectively monitor and maintain normal system operation 	Objective Met (see Section 3.3)

3.1 PERFORMANCE OBJECTIVE: DEMONSTRATE UNIFORM DISTRIBUTION OF PERSUFLATE

The first objective of the EK-TAP technology is to achieve uniform distribution of persulfate within the TTA under the established electric field conditions. For this Dem/Val, the effective distribution of the persulfate is essential to the success of the EK-TAP technology.

3.1.1 Data Requirements

Uniform distribution of persulfate was determined by measuring concentrations of persulfate and indicator parameters (i.e., sulfate and sulfur) at the groundwater monitoring locations in the TTA throughout the Phase 1 dipole test. Groundwater samples were collected and analyzed in accordance with the sampling plan. Additionally, measurements of electric current and voltage were taken during system operation to assess the uniformity of the electrical field

3.1.2 Success Criteria

This objective is considered achieved upon observing evidence of persulfate transport at monitoring locations (represented by measurements of persulfate, sulfate and sulfur in these wells), with persulfate concentrations ranging from 1% to 100% of the amendment supply concentration. Persulfate transport rates ranged from approximately 0.6 to 1.3 cm/day. The lower than anticipated transport rate is attributed to in-situ activation of the persulfate, likely due to elevated concentrations of iron in the TTA.

For successful achievement of a uniform electric field at design levels, the electrical gradient between any individual pair of wells should not be more than 5 times the average electrical gradient between all pairs of wells. Moreover, the electrical potential gradient between electrode pairs should be maintained at a level no more than 5 times the target gradient.

3.1.3 Performance Objective Assessment

As presented in **Table 6-3** and **Figure 6-5**, increases in the concentrations of persulfate were observed at all four performance monitoring wells (i.e., EKMWs) during the Dem/Val, and by the end of Phase 1 operations persulfate was detected at all four EKMWs at concentrations ranging from 1% to 100% of the amendment supply concentration. Increases in the concentrations of sulfate and sulfur by as much as 1 to 2 orders of magnitude were also observed at wells EKMW-11 and EKMW-12. The Dem/Val has met this criterion.

Calculated persulfate migration rates ranged from approximately 0.6 cm/day to 1.3 cm/day. However, the rate of persulfate migration was inhibited due to in-situ activation of the persulfate by naturally occurring subsurface conditions (e.g., elevated concentrations of iron). The Dem/Val has partially met this criterion.

As shown in **Figure 6-3**, voltage measurements at discrete locations within the TTA were between 5.9V and 21.9V indicating that an electric field was established in the area between the electrode wells. Voltage gradients between discrete locations of closest well pairs were calculated and ranged from 0.34 volts per meter (V/m) to 0.65 V/m, and were approximately 100x below the target estimated voltage gradient of 0.5 V/cm (or 50 V/m). The variation in voltage gradients between well pairs was generally <10%, indicating that the established voltage gradients were relatively uniform and no local focusing of the electric field was encountered within the TTA. The Dem/Val has met this criterion.

The EK system was designed and operated at a constant current, determined after the start-up period, during system operations. As presented in **Figure 6-1**, the voltage required of the *DC* power supply unit was generally consistent during periods of constant current, except for a few occasions

when electrodes needed cleaning. The electrical current supplied to individual wells during periods of constant current was generally steady (variation within 30% of average). Given that (i) soil electrical resistivity is a soil property not expected to vary over the course of Dem/Val, and (ii) the voltage output by the *DC* power supply unit and the current supplied to individual electrodes were generally steady, the electrical potential between electrode pairs within the TTA should maintain within 5x of target during operation. The Dem/Val has met this criterion.

3.2 PERFORMANCE OBJECTIVE: QUANTIFICATION OF EK SYSTEM OPERATIONAL PARAMETERS

For this Dem/Val, the application of the EK technology was focused on and limited to the TTA. The information obtained from this Dem/Val was used to assess the suitability of EK-TAP for full-scale operation at this and other sites.

3.2.1 Data Requirements

The suitability of the EK-TAP technology for full-scale implementation was assessed by measuring the electrical input (voltage/current) to achieve and maintain the desired electric field, by measuring operational parameters for maintaining consistent operation, and by determining the overall energy consumption within the TTA.

3.2.2 Success Criteria

This objective is considered achieved if system operational conditions are within \pm 50% of the designed target voltage and current. Additionally, successful accomplishment of this objective includes amendment supply uptime to be greater than 75% of target and the energy consumption to be within \pm 30% of the design estimate. Successful achievement also includes maintaining electrode function for at least one full cycle of EK-TAP.

3.2.3 Performance Objective Assessment

As discussed in Section 6.1 and Section 7.1 (criterion related to electrical gradient) and presented in **Figure 6-1**, the operating voltage and current remained relatively steady except when electrodes needed cleaning. Excluding these periods of temporary unstable readings, the overall system operation conditions were steady and within 50% of the average during each normal operation period. The Dem/Val has met this criterion.

As discussed in Section 6.1, system uptime was at least 85% during the periods when potassium bicarbonate was used to control pH in the electrode wells. During these periods, system downtime was predominantly a result of the weekly site visits for operation and maintenance (O&M) and/or groundwater sampling, in which case the *DC* power supply was manually turned off in order to protect the health and safety of field staff during these activities. The Dem/Val has met this criterion.

The EK system was designed and operated at a constant current, determined after the start-up period, during system operations. Given that the energy consumption is a function of voltage and current and, as discussed above regarding the steady system operation condition criterion, the overall system operations were steady and, thus, energy usage was also steady. The Dem/Val has met this criterion.

As noted in Section 1.2, only the first phase of testing (i.e., Phase 1 dipole test) was completed as a result of federal budget constraints. Other than a few occasions when the electrodes in the cathode wells needed to be cleaned, electrode function was maintained throughout system operations. The Dem/Val has met this criterion.

3.3 QUALITATIVE PERFORMANCE OBJECTIVES: DEMONSTRATE SAFETY, REALIABILITY, AND EASE OF IMPLEMENTATION

In addition to the quantitative objectives discussed above, qualitative objectives are also identified for this Dem/Val and include demonstrations of the safety, reliability, and ease of technology implementation.

3.3.1 Data Requirements

The suitability of the EK technology for full-scale implementation should include the considerations of safety and reliability of technology implementation. Operation records, including system operation monitoring records and field operators' notes, are the primary data for assessing the safety and reliability of the technology. For the ease of implementation criterion, field operation logs and records documented the utilization of field technician efforts for system operation and maintenance.

3.3.2 Success Criteria

This objective will be considered achieved if operational conditions remain stable over the course of the demonstration period and no lost-time incidents occur. The ease of technology implementation will be demonstrated if a single field technician is able to effectively monitor and maintain normal system operation.

3.3.3 Performance Objective Assessment

As discussed in Sections 7.1 and 7.2, the overall operational conditions remained relatively steady over the course of the Dem/Val, and there were no safety-related lost-time incidents. The Dem/Val has met these criteria.

The Dem/Val involved only conventional field construction techniques, including well drilling, well installation, and piping, as well as remediation system electrical connections performed by a qualified electrical subcontractor. The Dem/Val has met this criterion.

During system operations, one field technician performed routine system O&M tasks roughly twice per week with approximately 4 hours per visit. During the routine O&M visit, the tasks primarily included system visual inspections, recording the system operational parameters (voltage, current, amendment flow and pressure, etc.), and replenishing amendment solutions as needed. Additional system monitoring was completed remotely. Groundwater sampling events were also completed by one field technician. Over the course of system operations, there were fewer than 5 scheduled O&M events that involved two field technicians. The Dem/Val has met this criterion.

4.0 SITE DESCRIPTION

The target area for the EK-TAP Dem/Val is located within the vicinity of former Building 106 in Operable Unit 3 (OU3) at NAS Jacksonville (the Site; **Figures 4-1 and 4-2**), just south of where the ER-201325 EK-BIO Dem/Val was performed. Approval for performing the EK-TAP Dem/Val at the Site was granted by ESTCP in January 2019. This section provides a summary of site information most relevant to this technology Dem/Val.

4.1 SITE LOCATION AND HISTORY

The EK-TAP Dem/Val was conducted at NAS Jacksonville, which is located on the west bank of the St. Johns River in Duval County, Florida (**Figure 4-1**). The Dem/Val area is in OU3 in the vicinity of former Building 106, where the station's dry-cleaning facility once existed (**Figure 4-2**). The results of previous site characterizations in OU3 indicate that a tetrachloroethene (PCE) source zone exists in this area above and partially into a clay unit underneath the shallow sand unit.

NAS Jacksonville was commissioned in October 1940 to provide facilities for pilot training and a Navy Aviation Trades School for ground crewmen. The buildings in OU3 are industrial, consisting of administrative space, workshops, storage, and aircraft hangars. The majority of the buildings were constructed in the 1940s with several additions and re-fabrications taking place since then. Over 90 percent of OU3 is covered with buildings and thick (greater than 1 foot [ft]) concrete pavement.

The contamination within OU3 that is the focus of this Dem/Val is associated with PSC 48, the former station's dry-cleaning facility located in former Building 106. PSC 48 encompasses the footprint and immediate surrounding area of former Building 106. PCE was released at former Building 106 through occasional spills and leaks, resulting in contamination of the shallow aquifer. PCE and its dechlorination daughter products, including trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), and vinyl chloride (VC), have been detected in this area in permeable sand layers within the shallow aquifer (5 to 16.5 feet below ground surface [ft bgs]). Moreover, site characterization results indicate that CVOC mass present in the low-K clay layer beneath the shallow sand aquifer can serve as a long-term source of contamination to the shallow aquifer (EISB Workplan, Geosyntec, 2013). This low-K clay layer beneath the shallow sand aquifer is the target for this EK technology Dem/Val.

4.2 SITE GEOLOGY/HYDROGEOLOGY

Site geology was characterized as part of a previous ESTCP Project (ER-0705), as described in the *Data Analysis Report for Field Event 4: NAS Jacksonville* (ESTCP, 2012b). Lithology at OU3 consists of inter-bedded layers of sand, clayey sand, sandy clay, and clay. Soil cores collected and logged at OU3 (ESTCP, 2012a) indicate that the site lithology generally consists of:

- 0.5 to 5 ft bgs: Fine sand with gravel and silt/clay;
- 5 to 7.5 ft bgs: Clay with trace sand and organic matter;
- 7.5 to 16.5 ft bgs: Fine sand/silt to fine sand with silt/clay;





OU3, NAS Jacksonville





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٠	16.5 to 18.5	ft bgs:	Clay/silt with trace fine sand;
•	18.5 to 25	ft bgs:	Clay with trace sand; and
٠	25 to 30	ft bgs:	Fine sand with silt/clay to fine sand.

A transition layer between the shallow sand and clay layers has been observed in some soil cores, generally between 13 and 16.5 ft bgs. A soil core, OU3-4 (location shown in **Figure 4-2**), exhibiting the lithology representative of the target area is presented below in **Figure 4-3**. The same lithology was again observed within the TTA for this Dem/Val during installation of the demonstration wells. The Dem/Val specifically targeted the CVOCs (predominately PCE) in the clay layer which is between approximately 16.5 to 24 ft bgs underneath the shallow sand unit in this area.



Figure 4-3. Lithology of the Target Dem/Val Area (OU3-4 from ESTCP ER-201032)

Groundwater in this area is generally first encountered at approximately 5 ft bgs and flows towards the east with gradients ranging from 0.005 to 0.02 (ESTCP, 2012b). Past hydraulic testing estimated the mid-range hydraulic conductivity of the shallow sand aquifer at $5x10^{-3}$ cm/s (ESTCP, 2012b). The linear groundwater velocity was estimated as high as 101 feet per year (using a gradient of 0.005 and the mid-range hydraulic conductivity).

ESTCP Project ER-0705 conducted depth-discrete, aquifer specific-capacity tests at various locations in this area, including along a transect from ASU-2 through ASU-7 shown in **Figure 4-2**. Depth-discrete hydraulic conductivity estimates for the clay unit beneath the shallow sand aquifer showed that at approximately 17 ft bgs the average K_h was $4x10^{-5}$ cm/s (September 2011 data); however, there was not enough water at 6 of the 7 locations tested at the depth of 22 ft bgs to provide steady-state flow rates needed for the specific-capacity testing. Based on the soil core lithology observation and the orders of magnitude decrease of K_h from the shallow sand (5x10⁻³ cm/s) to the clay at a depth of 17 ft (4x10⁻⁵ cm/s), it is believed that the clay material below 17 ft bgs has a hydraulic conductivity lower than 10⁻⁵ cm/s.

4.3 CONTAMINANT DISTRIBUTION

Site investigations prior to the Dem/Val showed that PCE and degradation daughter products (TCE, cDCE, and VC) were present in permeable sand layers within the shallow aquifer (5 to 16.5 ft bgs). Chlorinated ethenes have also migrated, in part through molecular diffusion, into the clay layer (generally from 16.5 to 24 ft bgs) present beneath the shallow sandy aquifer. PCE is the dominant groundwater CVOC in this area, with TCE, cDCE and VC detected at lower concentrations. The groundwater quality data collected in January 2013 before this Dem/Val (Tetra Tech, 2013) indicate that groundwater monitoring wells screened in the shallow aquifer within the target area have total chlorinated ethene concentrations ranging from 194 micrograms per liter (μ g/L) in well PZ-04 to 51,000 μ g/L in well PZ-02.

Previous SERDP/ESTCP projects have profiled the distribution of CVOCs across both the sand and clay units in the target Dem/Val area (**Figures 4-4 and 4-5**). **Figure 4-4** presents the distribution of CVOCs in groundwater along a north-south cross section just to the east (downgradient) of the target Dem/Val area (transect along ASU2 through ASU7 shown in **Figure 4-2**).

As shown in **Figures 4-2** and **4-4**, previous sampling location OU3-3 is located just to the north of the target Dem/Val area, and within the footprint of the ER-201325 EK-BIO Dem/Val. **Figure 4-5** presents a conceptualized geologic cross section derived from high-resolution coring conducted at OU3-3 (ESTCP project ER-201032). At OU3-3, the vertical distribution of PCE, TCE, and cDCE in soil and groundwater at depths above, within, and below the clay unit depicts a classic PCE diffusion profile, with PCE penetration into approximately the upper 5 feet of the clay unit. Porewater PCE concentrations detected at OU3-3 at various depths across the clay unit ranged from 15,000 to 40,000 µg/L, indicating significant contamination within the depth interval targeted by the Dem/Val (~ 16.5 to 24 ft bgs).

Based on the site characterization results discussed above, the CVOCs residing in the clay unit in the proximity of OU3-3 represent a long-term continuing source for groundwater CVOC contamination in this and potentially the surrounding area.

During the ER-201325 EK-BIO Dem/Val, concentrations of PCE at well EKMW-11 which is located within the TTA of this EK-TAP Dem/Val, ranged from 160 μ g/L to 5,850 μ g/L.

Subsequent characterization data collected during the baseline sampling event for this Dem/Val are presented in Section 5.3.





OU3, NAS Jacksonville



Figure 4-5. Profiles of Soil and Groundwater CVOC Concentrations at OU3-3

(Source: ESTCP Project ER-201032)
5.0 TEST DESIGN

This section provides details pertaining to the design, installation, and implementation of the Dem/Val at the Site.

5.1 EXPERIMENTAL DESIGN

As discussed in the Demonstration Plan (Geosyntec, 2019b), a phased testing approach was developed for the Dem/Val. The first phase of testing (i.e., Phase 1 dipole test) was designed to assess the applicability of EK to migrate persulfate within the clay unit using DC power. The second phase of testing (i.e., Phase 2 heating and persulfate activation) was designed to assess the ability of the system components to heat the subsurface (using AC power) to the activation temperature of persulfate, and then evaluate treatment of the target contaminants following heat activation of the distributed persulfate. However, as noted in Section 1.2, only the first phase of testing was completed as a result of federal budget constraints.

The Phase 1 dipole test involved the installation of three (3) electrode wells (E10 through E12), four (4) supply wells (S9 through S12), and three (3) monitoring wells (EKMW-12, EKMW-13B and EKMW-14) south of the EK-BIO Dem/Val test area and oriented to include existing well EKMW-11 from the EK-BIO Dem/Val as a monitoring well for the Phase 1 dipole test (**Figure 5-**1). The target treatment interval (TTI) was from approximately 19 to 23 feet below ground surface (ft bgs) and within the clay unit. Prior to installing the wells, a comprehensive utility locate was conducted in the proposed Dem/Val area to help with positioning of the wells and to identify possible routes for transient contact with energized infrastructure during system operations.

As shown in **Figure 5-2**, the power supply unit, amendment supply units and manifolds, and system operation monitoring and control unit were housed in two 20-ft trailers (Control and Tank trailers) to the south of the Dem/Val test area. Amendment conveyance and electrical lines between the wells and the trailers were installed above ground in polyvinyl chloride (PVC) conduits, and temporary, lockable fencing was positioned around the test area as a security measure.

An underground injection control (UIC) notification memorandum was prepared and submitted to the Florida Department of Environmental Protection (FDEP) in July 2019 to request approval for injection of sodium persulfate and pH buffers via the supply and electrode wells, respectively. Preparation of the UIC notification memorandum included additional analytical testing of the proposed pH buffers in order to determine their chemical composition. In our experience at other sites, additional analytical testing of the chemical amendments (i.e., beyond information provided in the manufacturer-provided chemical safety data sheets) is not typically required. Approval of the proposed injection activities was granted by FDEP in September 2019 (FDEP, 2019). A subsequent UIC modification request was submitted to FDEP in January 2020 to request approval for increasing the quantity of potassium bicarbonate that will be added via the electrode wells during pilot test operations. The UIC modification request was approved by FDEP in February 2020 (FDEP, 2020).









Baseline soil samples were collected during installation of the wells, and baseline groundwater samples were collected following well installation and development. Baseline characterization results are presented in Section 5.3.

The Phase 1 dipole test began on October 9, 2019 and continued until May 8, 2020 (approximately 7 months). During Phase 1 operations, sodium persulfate was added at the supply wells. A *DC* electric field was established across the TTA between the cathodes and anode, and the induced *DC* electric field facilitated the transport of persulfate by electromigration. pH buffer (potassium bicarbonate or potassium carbonate) was added to the electrode wells to allow for pH control in these wells. The EK system also allowed for cross-circulation of electrolytes (fluids in electrode wells) between the cathodes and anode for overall pH control. Groundwater samples were collected from the monitoring wells on a bi-weekly basis for analysis of field parameters (temperature, pH, specific conductance, dissolved oxygen [DO], oxidation-reduction potential [ORP], and turbidity), persulfate, sulfate, sulfur, dissolved iron and manganese, and TOC. Results of the performance monitoring groundwater sampling program are presented in Section 6.2.

Of note, the design for the Dem/Val did not include a "blank" or control cell for comparison (i.e., where a persulfate oxidation or ERH approach is implemented without the use of EK delivery) as the state of the technology is such that the extra cost was not considered an effective return on investment.

5.2 LABORATORY TREATABILITY STUDY RESULTS

Several laboratory treatability studies were performed during the site selection/re-selection process and included laboratory natural oxidant demand tests and 1-dimensional column tests to assess the applicability of the EK-TAP technology for the OU3 area at NAS Jacksonville. Results of the studies suggested that the Building 106 area may be a suitable location for the Dem/Val, and also served as the basis for performing the Dem/Val in a phased approach. Additional details and results of the studies are presented in other reports (Geosyntec, 2016; Geosyntec, 2019a).

5.3 **BASELINE CHARACTERIZATION**

As discussed in Section 4, several previous SERDP/ESTCP projects (ER-0705, ER-1740, ER-201032, and ER-201325) have characterized the geology, hydrogeology, and contaminant distribution in the general area that encompasses the target Dem/Val area.

To establish the baseline geochemical conditions and contaminant distribution specifically within the TTA for this Dem/Val, soil characterization was performed during installation of select wells, and groundwater characterization was performed following installation of the monitoring wells. **Table 5-1** presents a summary of the baseline sampling program that was performed for this Dem/Val.

	Matrix	Frequency	Analyses	Location
Baseline	Soil	Two depths per boring	CVOCs ⁽¹⁾ , anions ⁽²⁾ , total metals ⁽³⁾ , pH, and total sulfur	E10, E11
Sampling	Groundwater	One Time	Field geochemistry ⁽⁴⁾ , CVOCs, persulfate ⁽⁵⁾ , anions ⁽²⁾ , TOC, metals ⁽³⁾	EKMW-11, EKMW-12, EKMW-13B, EKMW- 14

 Table 5-1.
 Summary of Baseline Sampling Program

(1) CVOCs: PCE, TCE, cDCE, and VC.

(2) Anions = chloride, nitrate, nitrite, sulfate.

(3) Metals = iron, manganese, calcium, and magnesium.

(4) Field geochemistry = temperature, pH, specific conductance, DO, ORP, and turbidity.

(5) Persulfate concentration in groundwater will be measured in the field using a field test kit.

Soil cores for the baseline sampling event were collected using a split spoon sampling approach during installation of wells E10 and E11. At each location, soil cores were obtained from depths between approximately 15 ft bgs and 23 ft bgs. The cores were also screened using a photo-ionization detector (PID) and field personnel logged the cores for soil type and stratigraphy. Sample depths were decided in the field based on PID concentrations and observations of lithology to bias the sampling towards clay materials. Two soil samples were collected from each of E10 and E11, at depths ranging between 17 and 21 ft bgs, and samples were submitted for laboratory analyses of CVOCs, anions, total metals, pH, and total sulfur (**Table 5-1**). Terra Core samplers were used for soil sample collection to minimize volatilization loss, and all down-hole drilling equipment was decontaminated between borings.

Following installation and development of the monitoring wells, groundwater samples were collected from all four Dem/Val groundwater monitoring wells (EKMW-11, EKMW-12, EKMW-13B and EKMW-14). Baseline geochemical characterization of groundwater included measurements of field parameters (temperature, pH, specific conductance, DO, ORP, electrical conductivity, and turbidity) and persulfate. Groundwater samples were collected and submitted for laboratory analyses of CVOCs, anions (chloride, nitrate, nitrite and sulfate), TOC, and dissolved metals (iron, manganese, calcium and magnesium). Additional samples were collected from well EKMW-13B and other wells outside of the TTA for analyses required under the UIC Approval Order.

Field sampling and laboratory analyses were performed in accordance with the sampling and analysis methods presented in Section 5.6. Field sampling forms are provided in **Appendix A**. The baseline soil sampling results are summarized in **Table 5-2**. The baseline groundwater sampling results are summarized along with the performance monitoring results and are presented in **Tables 6-2 to 6-4** in Section 6.2.

The baseline soil characterization data was consistent with baseline soil data from the EK-BIO Dem/Val and suggested that the majority of soil PCE within the TTA appeared to be present above a depth of 21 ft. The baseline groundwater characterization data indicated that groundwater within the TTA was generally acidic and slightly reducing, with elevated concentrations of iron at some wells.

Table 5-2.Baseline Soil Results

		Depth	Vola	tile Organic C	Compounds (µ	g/kg)	Metals (mg/kg)					
Well ID	Sample Date	(ft)	PCE	TCE	cDCE	VC	Calcium	Iron	Magnesium	Manganese		
E10	11-Jun-19	19	7800 J	7800 J 41 J+ 42 1.9 J 2,5		2,500	11,000	1,700	52			
EIU	11-Jun-19	21	130	2.8 J	1.6 J	2.2 U	2,300	10,000	1,500	51		
E11	12-Jun-19	17	7500 J	44 J+	33	1.1 J	2,000	9,100	1,400	42		
EII	12-Jun-19	19	3700 J	13 J+	6.8	2.5 U	2,800	15,000	1,900	64		
DUP	12-Jun-19	19	3700 J	14 J+	8.3	2.4 U	2,600	13,000	1,800	54		
Trip Blank (a)	12-Jun-19		0.5 U	0.5 U	0.5 U	0.5 U						

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		Depth		Anions	(mg/kg)		Sulfur	
Well ID	Sample Date	(ft)	Nitrate	Nitrite	Sulfate	Chloride	(mg/kg)	pH ^(b)
E10	11-Jun-19	19	0.26	0.13 U	7.3	600	550 U	5.0 J
EIU	11-Jun-19	21	0.50	0.13 U	2.5 J	360	560 U	5.0 J
E11	12-Jun-19	17	0.14 J	0.13 U	7.2	650	490 U	4.8 J
EII	12-Jun-19	19	0.1 J	0.14 U	2.4 J	610	590 U	5.1 J
DUP	12-Jun-19	19	0.24 J	0.14 U	2.3 J	690	530 U	5.1 J
Trip Blank (a)	12-Jun-19							

Notes:

Bold values indicate detected results

(a) Concentrations for Trip Blank are reported in micrograms per liter (µg/L)

(b) - pH adjusted to 25 °C

µg/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

DUP - Duplicate sample

J - Estimated concentration

J+ - bias is high

U - Not detected above the reporting limit listed

-- - Not analyzed/not applicable

5.4 DESIGN AND LAYOUT OF TECHNOLOGY COMPONENTS

The locations of the electrode wells, supply wells, and monitoring wells are shown in **Figure 5-1**. System components and equipment for amendment supply were housed in the Control and Tank trailers that were positioned to the south of the Dem/Val test area. Prior to field construction and installation, a comprehensive utility locate and survey was conducted in the proposed Dem/Val area. The Dem/Val system design and well network was adjusted based on the results of these surveys. The following sections describe the specifics of individual system components.

5.4.1 Electrode Wells

Three electrode wells (E10 through E12) were installed by hollow stem auger (HSA) drilling in the TTA. Descriptions of the lithology and electrode well construction details are provided in **Figure 5-3**. Each electrode well was constructed with 4-inch diameter PVC riser casing and a 4-ft long, 0.01-inch slotted screen. The screened interval was between approximately 19 and 23 ft bgs (i.e., same screened interval as existing monitoring well EKMW-11) within the clay unit. A medium sand (20/30) filter pack was placed around the screen from the bottom of the borehole up to the top of the screen, and topped by a fine sand (30/65) filter pack up to one foot above the screened interval. A 2-ft thick bentonite seal was installed above the sand. Grout, consisting of Type I/II Portland cement, was then added to fill the remaining annulus up to the bottom of the well vault.

The electrode wells were completed as flush mounts during installation, with surface completions consisting of an 8-inch steel traffic rated manhole cover set in a 2 ft x 2 ft x 6-inch thick concrete pad. The pad was sloped away from the well to shed surface water. The top of the riser casing was fitted with a threaded coupling to accommodate a PVC riser extension and flange assembly that extended approximately 1 ft above ground surface and facilitated installation of the down-well components. Access ports were installed in the flange for installation of the electrode, tubing for buffer addition and pH monitoring, and level switches. **Figure 5-4** presents the details of the electrode well surface completions.

5.4.2 Supply Wells

Four supply wells (S9 through S12) were installed by HSA drilling in the TTA. Descriptions of the lithology and supply well construction details are provided in **Figure 5-5**. Each supply well was constructed with 4-inch diameter PVC casing and 0.01-inch slotted screen. The screened interval was between approximately 19 and 23 ft bgs (i.e., same screened interval as existing monitoring well EKMW-11) within the clay unit. Two voltage probes were attached to the slotted screen portion of supply well S9 for use in monitoring the distribution of the electric field within the TTA during Phase 1 operations. A medium sand (20/30) filter pack was placed around the screen from the bottom of the borehole up to the top of the screen and topped by a fine sand (30/65) filter pack up to one foot above the screened interval. Approximately 2-ft thick bentonite seal was installed above the sand pack by placing bentonite pellets and hydrating for at least one hour. Grout, consisting of Type I/II Portland cement, was then added to fill the remaining annulus up to the bottom of the well vault.



Figure 5-3. Electrode Well Details

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Figure 5-4. Electrode Well Surface Completion Details





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The supply wells were completed as flush mounts during installation, with surface completions consisting of an 8-inch steel traffic rated manhole cover set in a 2 ft x 2 ft x 6-inch thick concrete pad. The pad was sloped away from the well to shed surface water. The top of the riser casing was fitted with a threaded coupling to accommodate a PVC riser extension and flange assembly that extended approximately 1 ft above ground surface and facilitated installation of the down-well components, including level switches and tubing for persulfate addition. **Figure 5-6** presents the details of the supply well surface completions.

5.4.3 Clay Unit Monitoring Wells

Three monitoring wells (EKMW-12, EKMW-13B and EKMW-14) were installed in the clay unit of the TTA using HSA drilling. Descriptions of the lithology and monitoring well construction details are provided in the borehole logs in Appendix B. Monitoring well construction details are provided in Figure 5-7. Monitoring wells were constructed as double-cased wells, each with a 6inch PVC surface casing installed to approximately 18 ft bgs and grouted in place. Each monitoring well was then constructed by drilling through the bottom of the grouted 6-inch casing and installing 2-inch diameter PVC casing and 0.01-inch slotted screen. The screened interval was between approximately 19 and 23 ft bgs (i.e., same screened interval as existing monitoring well EKMW-11) within the clay unit. Two voltage probes were attached to the slotted screen portions of monitoring wells EKMW-12, EKMW-13B and EKMW-14 for use in monitoring the distribution of the electric field within the TTA during Phase 1 operations. A medium sand (20/30) filter pack was placed around the screen from the bottom of the borehole up to the top of the screen, and topped by a fine sand (30/65) filter pack above the screened interval. A bentonite seal was then installed above the sand pack by placing bentonite pellets and hydrating for at least one hour. Grout, consisting of Type I/II Portland cement, was then added to fill the remaining annulus up to the bottom of the well vault.

Surface completions for the monitoring wells consisted of an 8-inch steel traffic rated manhole cover set in a 2 ft x 2 ft x 6-inch thick concrete pad. The pad was sloped away from the well to shed surface water. The top of the well casing was fitted with a compression cap to prevent entry of surface water.

5.4.4 **Power Supply and Electrodes**

Power for the Control and Tank trailers was obtained from the existing electrical panel that was installed for the EK-BIO Dem/Val, and all electrical connections between the panel and trailers were completed by a licensed electrician. *DC* power for Phase 1 operations was supplied by a Magna Power SL 160-9/VI (160 VDC, 9A, 120V AC in) power supply unit. The *DC* power supply was operated in constant current mode allowing the voltage to automatically adjust to the changes in soil conductivity.









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Each electrode was a titanium rod (³/₄-inch diameter) with a mixed metal oxide (MMO) coating manufactured by Water Star. The coating consists of IrO₂/Ta₂O₅ and was suitable for use in soils, carbonaceous backfill, fresh and brackish water, seawater and concrete. The titanium substrate is designed to remain stable throughout the design life of the electrode. Each electrode was 24 inches in length and one electrode was hung in each electrode well with the top of the electrode positioned at the top of the well screen. The electrode was center-connected to cathodic protection cable. The cable contained soft drawn bare copper strand surrounded with low-density polyethylene (LDPE) covering that is designed for use in cathodic systems to protect against galvanic and electrolytic corrosion.

5.4.5 Amendment Supply System

Dedicated amendment conveyance tubing ran between the EK Control and Tank trailers and the electrode well network through aboveground PVC conduits. Sodium persulfate (40 grams per liter [g/L]) was delivered from a 350-gallon chemical holding tank to the supply wells using timer-controlled chemical feed pumps. The sodium persulfate solution was prepared by mixing solid sodium persulfate (Klozur® SP; PeroxyChem) with potable water in the chemical holding tank.

Electrolysis of water in electrode wells produces acid (at the anode) and base (at the cathode) resulting in pH changes. A recirculation pump system was used to monitor the pH of the groundwater within each electrode well, and pH buffer (potassium bicarbonate or potassium carbonate) was supplied from a 500-gallon chemical holding tank to the cathode and anode wells as needed to adjust the pH in these wells. The pH buffer solutions were prepared by mixing solid potassium bicarbonate or potassium carbonate with potable water and/or extracted water from the electrode wells to a maximum concentration of 1.7 g/L (limited by the UIC Approval Order). Addition of the pH buffers was performed in timed additions using a feed pump controlled by the system programmable logic controller (PLC).

All chemical holding tanks were located in the Tank trailer. All groundwater amendments used during the Dem/Val were approved under the UIC permit (Geosyntec, 2019c; FDEP, 2019; FDEP, 2020). The volumes and concentrations of amendments delivered during Phase 1 operations are presented and discussed in Section 5.5.2.

5.4.6 **Process Monitoring and Controls**

The EK system was constructed with instrumentation and controls to monitor and operate the system automatically using a PLC that was housed within the Control trailer. Overall operation of the pumps for amendment supply and electrolyte cross-circulation was controlled by timers in the PLC. The PLC also controlled solenoid valves in the Control and Tank trailers to direct flows between the chemical holding tanks and individual wells.

In-line water quality stations monitored the pH, temperature, and electrical conductivity (EC) of the fluid coming from/to an individual electrode well. Voltage was also monitored at the voltage probes installed on select supply or monitoring wells. Data acquisition systems were used to record all data collected.

5.4.7 Conveyance Piping and Utilities

Dedicated amendment conveyance tubing ran between the EK Control and Tank trailers and the electrode well network through aboveground PVC conduits (**Figure 5-2**). The conduits were supported using elevated pipe supports. All electrical connections between the existing electrical panel and the trailers were completed by a licensed electrician.

5.5 FIELD TESTING

As discussed in Section 5.1, a phased testing approach was developed for the Dem/Val. However, due to federal budget constraints only the first phase of testing was completed. This section provides a description of the Phase 1 dipole test activities.

5.5.1 System Start-up

EK system start-up commenced following installation and shakedown of the system components described above in Section 5.4, and issuance of the UIC Approval Order from FDEP. System startup activities involved intermittent *DC* application *via* the down-well electrodes in E10, E11 and E12, along with extraction of water from these wells, amendment of extracted water with potable water and potassium bicarbonate, and addition of the amended water *via* the same wells (E10, E11 and E12). A small amount of potable water was also injected *via* supply wells S9 and S12 during system shakedown testing. Surface testing of voltages all metal structures in the vicinity of the TTA was also conducted using a handheld voltage meter during start-up to confirm that structures were not energized by the EK infrastructure. The field personnel wore rubber boots and rubber gloves when performing this task.

Start-up operations included continuous monitoring of PLC data to monitor and adjust system operations as needed based on field observations. Amendment dosing rates and timing for the electrode and supply wells were adjusted, as necessary, based on operations monitoring. A recirculation pump system was used to monitor the pH of the groundwater within each electrode well. If the pH increased (at the cathodes) or decreased (at the anode) beyond the system alarm setpoints, the PLC would turn off the *DC* power supply to help prevent the development of highly acidic or basic conditions from forming within the wells which could result in damage to the wells or down-well components.

The distribution of the electric field within the TTA was monitored using voltage probes attached to the slotted screens of the monitoring wells and supply well S9. As discussed in Section 6.1, a relatively uniform electric field was confirmed for the TTA based on the voltage measurements taken at these locations.

5.5.2 Phase 1 Operations – Persulfate Migration

Phase 1 operations was initiated on October 9, 2019 and continued for approximately 7 months until May 8, 2020, when operations ended. Phase 1 operations involved the following activities:

1. Extraction of groundwater from wells E10, E11 and E12, amendment of extracted groundwater with potable water and potassium bicarbonate or potassium carbonate, and addition of the amended water *via* wells E10, E11 and E12;

- 2. Addition of sodium persulfate (40 g/L) *via* wells S9 and S12 from October 9, 2019 to May 8, 2020;
- 3. Addition of sodium persulfate (40 g/L) *via* wells S10 and S11 from December 9, 2019 to May 8, 2020; and
- 4. Application of *DC via* the down-well electrodes in E10, E11 and E12.

The distribution of the electric field within the TTA was monitored by determining the voltage gradient between the electrode wells and voltage probes. Process control parameters (i.e. voltage, pH, and electrical conductivity) were monitored to evaluate process control requirements. In addition, the total volume and flow rate of persulfate and pH buffers into the system were monitored and recorded. System inspections were conducted generally twice a week by a field technician to monitor and record system operational conditions and perform routine maintenance, mainly related to amendment stock solution replenishment and filter cleaning/replacement. Flow rates and the timing for persulfate and pH buffer additions to the wells were adjusted, as necessary.

Table 5-3 summarizes the total mass and volumes of amendments supplied to the TTA during the Dem/Val. Buffering of pH at the electrode wells was accomplished using potassium bicarbonate during system startup and for roughly the first two months of Phase 1 operations (i.e., October 9 to December 20, 2019), after which time the supply of potassium carbonate was disrupted due to a chemical supplier shortage, and potassium carbonate was used until the supply of potassium bicarbonate was restored on February 21, 2019. Over the course of the Dem/Val, approximately 286 pounds (lbs; 880 gallons) of sodium persulfate was delivered to the four supply wells, and approximately 156 lbs of potassium bicarbonate and 5.4 lbs of potassium carbonate were added to the electrode wells. The net volume of fluid added to the electrode wells was negligible as the volumes of extracted and injected water for these wells were roughly the same.

A summary of the performance monitoring groundwater sampling and analysis performed during Phase 1 operations is provided in **Table 5-4**. Details about the sampling methods and field quality control procedures are discussed in Section 5.6. Additional samples were collected from well EKMW-13B and other wells outside of the TTA on a quarterly basis for analyses required under the UIC Approval Order.

Table 5-3. EK-TAP Dem/Val Amendment Injection Totals

		Injection Totals Maximum Injection Amounts Under UIC Approval Order**						
Wells	Injection Amendment	Total Injection Volume (gal)	Total Injection Mass (lb [kg])	on Injection Concentration (g/L) (gal)		Injection Mass (lb [kg])	Injection Concentration (g/L)	
	Potassium bicarbonate		156 [71]	1.7		268 [122]	1.7	
-	Potassium carbonate		5.4 [2.5]	0.3		268 [122]	1.7	
Electrode/Injection (E10, E11, E12)	Potassium phosphate mono-basic	NA*	0 [0]	0	18,900	300 [136]	1.9	
(EIV, EII, EI2)	Potassium phosphate di-basic		0 [0]	0		300 [136]	1.9	
	Sodium hydroxide		0 [0]	0		300 [136]	2	
Supply/Injection (S9, S10, S11, S12)	Sodium persulfate	880	286 [130]	39	8,400	2,804 [1272]	40	

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Notes:

gal - gallons

lb - pounds

kg - kilograms

g/L - grams per liter

*An equivalent volume of water was extracted from these wells since the pH buffer amendment system was operated as a recirculation loop within each well. The net injection volume was negligible.

**Maximum injection amounts approved by FDEP per the modified UIC Approval Order (dated February 14, 2020).

	Matrix	Frequency	Analyses	Location
Phase 1 Operations	Groundwater	Bi-Weekly ⁽¹⁾	Field geochemistry ⁽²⁾ , persulfate ⁽³⁾ , sulfate, sulfur, iron and manganese, TOC, CVOCs ⁽⁵⁾	All 4 Dem/Val monitoring wells ⁽⁴⁾

Table 5-4.Summary of Performance Monitoring Program

(1) Bi-weekly = once every two weeks. Additional samples were collected for select analytes during the Dem/Val, as needed. Persulfate readings were collected more frequency to assess migration within the TTA.

- (2) Field geochemistry = temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction potential, and turbidity.
- (3) Persulfate concentration in groundwater will be measured in the field using a field test kit.
- (4) Dem/Val monitoring wells are EKMW-11, EKMW-12, EKMW-13B and EKMW-14
- (5) CVOCs: PCE, TCE, cDCE, and VC. While bi-weekly sampling for VOCs was not included in the monitoring plan presented in the Demonstration Plan (Geosyntec, 2019b), CVOCs were added to the analyte list during operations as another line of evidence to demonstrate persulfate migration during the Dem/Val.

5.5.3 Decommissioning

Due to federal funding constraints, system decommissioning was not completed as part of the Dem/Val.

5.6 SAMPLING METHODS

In addition to operational data (i.e., electrical current and voltage, flow rates of amendments, pH, etc.) recorded by the PLC, an overall field monitoring and sampling program was performed for the Dem/Val. This section describes the sampling and analytical methods, the equipment calibration, the quality assurance sampling, decontamination procedures, and sample documentation. Sampling was only conducted when the *DC* system was not operational to prevent electrical safety hazards.

5.6.1 Sampling and Analytical methods

The Dem/Val monitoring program included both measurements of field parameters and collection of environmental samples (soil and groundwater) for laboratory analyses. **Table 5-5** summarizes the laboratory analytical methods. The methods for field sample collection and field parameter measurements are described in this section.

For soil sampling, baseline soil cores were collected using a split-spoon sampling approach during installation of select Dem/Val wells, as described in Section 5.3. Up to two soil samples were collected from two locations (E10 and E11), and samples were submitted for laboratory analyses of CVOCs, anions, total metals, pH, and total sulfur (**Table 5-1**). Terra Core samplers were used for soil sample collection to minimize loss of CVOCs due to volatilization. All down-hole drilling equipment was decontaminated between each boring.

The groundwater monitoring well network for the Dem/Val is presented in **Figure 5-1**. A summary of the locations and frequencies of groundwater samples, and the analytical parameters that were analyzed during the baseline characterization and performance monitoring programs are presented in **Tables 5-1 and 5-4**, respectively (see Sections 5.3 and 5.5.2 for details).

Matrix	Analyte	Method ⁽¹⁾	Container	Preservative	Holding Time
	VOCs	8260B	3x 10-gram Terra Cores	2 with NaHSO ₄ ; 1 with methanol; $4 \pm 2^{\circ}C$	14 days
Soil	Persulfate	Modified EPA 300	2-oz glass jar	$4 \pm 2^{\circ}C$	
	Total metals (Ca ²⁺ , Fe, Mn, Mg ²⁺), total sulfur	6010B	2-oz glass jar	4 ± 2°C	6 months
	Anions (Cl ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , SO ₄ ⁻²)	300.0	2-oz glass jar	$4 \pm 2^{\circ}C$	Up to 28 days
	VOCs	8260B	40 mL VOA vial	$HC1^{(2)}; 4 \pm 2^{\circ}C$	14 days
	Dissolved metals (Ca ²⁺ , Fe, Mn, Mg ²⁺)	200.7	250 mL polyethylene	HNO ₃ ; 4 ± 2°C	6 months
Groundwater	Anions (Cl ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , SO ₄ ²⁻)	300.0	250 mL polyethylene	$4 \pm 2^{\circ}C;^{(2)}$	28 days (except NO3 ⁻ at 48 hours)
	Persulfate	Field	25 mL glass		
	тос	SM5310b	125 mL amber glass	$H_2SO_4: 4 \pm 2^{\circ}C$	28 days

Table 5-5. **Analytical Methods for Sample Analysis**

<u>Notes</u> 1. Anticipated laboratory analytical method. If the contracted lab does not perform the listed method an equivalent EPA or Standard Methods analytical method will be used.

2. Samples submitted for analysis of VOCs and chloride following oxidant application will be quenched using ascorbic acid as detailed in USEPA (2012).

Groundwater elevation was measured for each monitoring well prior to sampling. After opening each well, the groundwater elevation was allowed to equilibrate with atmospheric conditions for approximately 5 minutes before taking water level measurements. The depth to groundwater and total well depth were measured using a Solinst interface meter (or equivalent) in 0.01-ft increments, relative to a permanently marked survey point located at the top of the well casing and recorded on the purge log field form. Monitoring wells were purged prior to groundwater sample collection. During purging, in-line water quality parameters were monitored for temperature, pH, specific conductance, DO, ORP, and turbidity. Stabilized readings of parameters were recorded on the field sampling log form, and groundwater samples were collected into the appropriate laboratory prepared and preserved sample containers. Sampling equipment and measurement tools lowered into wells for in-well readings were decontaminated between wells as described in Section 5.6.4.

All soil and groundwater samples collected during the Dem/Val were submitted to Eurofins TestAmerica (St. Louis, Missouri, USA). Sampling containers, holding times, and preservation methods associated with each method are presented in **Table 5-5**. The sample containers were clearly labeled and placed in an insulated cooler with ice for shipping to the laboratory following proper chain-of-custody protocols.

5.6.2 Calibration of Analytical Equipment

The field PID and water quality instruments were calibrated at the beginning of each day of sampling activities. At the end of the day, the instrument calibration was checked against the calibration standards. All calibration data were recorded on field calibration sheets.

Appropriate corrective actions were taken if a field instrument fails the instrument-specific calibration quality control criteria. Corrective action steps were as follows:

- the instrument was checked;
- the cause of failure was investigated;
- the instrument was recalibrated;
- if the instrument recalibration failed again, the instrument manufacturer or rental company technical support departments were contacted for assistance;
- if the problem persisted, the instrument was sent for service and a replacement unit was promptly obtained; and
- if the instrument was a rental, the rental office was contacted for immediate replacement of the instrument.

5.6.3 Quality Assurance/Quality Control

Quality assurance for field sampling comprised of collecting field quality control samples to indicate the accuracy and precision of the data collected. The quality assurance sampling included field duplicates, matrix spike/matrix spike duplicates (MS/MSD), field blanks, and trip blanks. No equipment rinsate blank was required because the groundwater samples were collected using dedicated sampling equipment.

Appendix C includes the laboratory chain of custody forms.

5.6.4 Decontamination Procedures

Decontamination of non-disposable sampling equipment was performed to prevent the introduction of extraneous material into samples, prevent cross-contamination between samples, and to ensure the health and safety of field personnel. The following general procedure was followed to clean equipment and sampling devices prior to and between each use.

Sampling equipment and measurement tools lowered into wells for in-well readings were disassembled to the extent possible and scrubbed with a stiff-bristle brush using a solution of laboratory grade detergent such as Liquinox and potable water. The equipment was then rinsed with potable water in a separate bucket to remove any remaining detergent, and then rinsed again in a third bucket or tub containing deionized or distilled water as a final rinse. After the final rinse, the equipment was re-assembled and placed on a clean surface covered with plastic or aluminum foil to air dry.

All decontamination fluids were contained for subsequent disposal by NAS Jacksonville personnel.

5.6.5 Sample Documentation

Field forms were used to record the sampling conditions and the collected samples. All samples were clearly labeled on-site prior to packing them in coolers for shipment. A custody seal on the sample coolers and chain-of-custody were employed to ensure the integrity of samples during shipment. The laboratory was asked to check for completeness and integrity upon receiving a shipment of samples. Upon receipt of the samples, the laboratory immediately reported any samples that were missing or appeared damaged.

6.0 SAMPLING RESULTS AND DISCUSSION

This section presents a detailed summary and discussions of all monitoring/sampling results. While baseline characterization results have already been presented in Section 5.3, select baseline characterization data are incorporated in this section, as appropriate, with other performance monitoring data to support analyses and discussions related to changes of groundwater conditions during the Dem/Val.

6.1 SYSTEM OPERATIONS MONITORING

Figure 6-1 presents the power usage over the course of Phase 1 operations. The voltage (V) and current (A) readings recorded at the power supply unit over the duration of operation are used to calculate the electrical power usage (kilowatt-hour [kW-hr]). The system was designed and operated to supply a constant current, determined after the start-up phase, and the power supply unit would then operate at a voltage level that was required in response to field electrical resistivity in order to maintain the supply of constant current.



Figure 6-1. Power Usage During Phase 1 Operations

Figure 6-1 shows that the power supply unit's voltage output remained generally steady during periods of constant current.

As shown in **Figure 6-1**, the *DC* power supply unit was operated at a constant current of approximately 2.7A for roughly the first 6 weeks of operations, after which time the current was gradually increased to approximately 4A over an approximate 4-week period. The current was then lowered to approximately 3.2A and was held at this level for the remainder of system operations. The *DC* power supply unit's voltage output remained generally steady during periods of constant current. There were, however, several instances in January and February 2020 when the electrodes in wells E10 and E12 (i.e., cathodes) needed to be cleaned due to a build-up of scale on the electrode surface. As discussed below, this was also the same time during which control of pH at the electrode wells was problematic when the supply of potassium bicarbonate was disrupted.

Prior to the electrode cleaning, the system voltage readings would indicate the operating conditions were becoming unsteady. Electrode cleaning was accomplished by removing the electrode from the well and submerging it in a dilute acid bath (e.g., acetic acid) to dissolve the scale. All electrode cleaning fluids were containerized for subsequent disposal by NAS Jacksonville personnel.

System uptime, measured as *DC* uptime, or the percentage of time that the *DC* power supply unit was on and delivering current to the electrodes, was monitored throughout system operations. A summary of the system uptime during various periods of pH buffer usage is presented in **Figure 6-2**.



Figure 6-2. System Uptime During Phase 1 Operations

Between October 9, 2019 and December 20, 2019 when potassium bicarbonate was used as the pH buffer, system uptime was approximately 85%. During this period, system downtime (i.e., when the DC power supply was off) was predominantly a result of the weekly site visits for O&M and/or groundwater sampling, in which case the DC power supply was manually turned off in order to protect the health and safety of field staff during these activities. Between December 21, 2019 and February 20, 2020, when the supply of potassium bicarbonate was disrupted, system uptime was significantly impacted and decreased to roughly 25% over this period. It is believed that the potassium carbonate, when added to the electrode wells at the maximum concentration permitted by the UIC Approval Order, was simply not as effective at controlling pH within the electrode wells, which resulted in frequent automatic shut-downs of the DC power supply unit when pH at the electrodes exceeded the alarm setpoints. Once the supply of potassium bicarbonate was restored on February 21, 2020, pH at the electrodes became easier to control and system uptime recovered and was roughly 92% through the end of system operations.

The total energy usage by the EK system's *DC* power supply unit during the 7 months of system operations was calculated to be approximately 425 kW-hr. For comparison, this energy usage is equivalent to operating a single 100W lightbulb for approximately 6 months.

In addition to monitoring the *DC* power supply unit, field measurements were taken to confirm the establishment of the electric field within the TTA. Temporal changes in the voltage measurements over the course of the Dem/Val are shown in **Figure 6-3**. Voltage measurements within the TTA showed relatively uniform voltage gradient at all locations (i.e., generally <10% variation among monitoring locations).



Figure 6-3. Voltage Measurements at Voltage Probes Within TTA

(Values for each well are the average of the two voltage probes affixed to the well screens)

The voltage measurements taken at individual voltage probes were used to assess if a uniform electric field was established within the TTA. Voltage measurements at individual wells relative to a common reference at the EK control system were between 5.9V and 21.9V indicating that an electric field was established in the area between electrode wells. Voltage gradients between discrete locations of closest well pairs were calculated and ranged from 0.34 V/m to 0.65 V/m. The variation in voltage gradients between well pairs was generally <10%, indicating that the established voltage gradients were relatively uniform and no local focusing of the electric field was encountered within the TTA.

Table 6-1 below presents the average and standard deviation calculated for the electrical current to individual wells during periods of constant current.

Oct to Nov 2019	Current (A)							
Target Current: 2.7 A	rrent: 2.7 A Anode Cat							
	E11	E10	E12					
Avg	2.6	1.3	1.2					
Std Dev	0.1	0.2	0.1					

 Table 6-1.
 Electrical Current to Electrode Wells

Jan to May 2020	Current (A)							
Target Current: 3.2A	Anode	Anode Cathodes						
	E11	E10	E12					
Avg	3.0	1.3	1.6					
Std Dev	0.1	0.4	0.3					

A – amps

Avg-average

Std Dev – standard deviation

The data show that the current supply to individual electrode well was generally steady (variation within 30% of average). Given that (i) soil electrical resistivity is a soil property not expected to vary over the course of Dem/Val, and (ii) the voltage output by the *DC* power supply unit and the current supplied to individual electrodes were generally steady during the time periods indicated in **Table 6-1**, the electrical potential between electrode pairs within the TTA should maintain within 5x of target during operation.

6.2 GROUNDWATER SAMPLING RESULTS

Groundwater monitoring data are summarized in **Tables 6-2 through 6-4**. The locations of groundwater monitoring wells are presented in **Figure 5-1**.

6.2.1 Groundwater Geochemistry

A summary of the groundwater field parameter measurements made throughout the Dem/Val are provided in Table 6-2, and temporal changes in pH and ORP at the four EKMWs are shown on Figure 6-4. Changes in pH and ORP were most notable at EKMW-11, with both parameters transitioning to levels representative of oxidizing conditions (i.e., pH decreased to ~3, while ORP increased to ~350 millivolts [mV]) approximately 7 weeks after the start of persulfate addition at well S9. Once established, oxidizing conditions were sustained at EKMW-11 for the remainder of the Dem/Val. A shift towards oxidizing conditions (i.e., pH decreasing to below 4.5 and ORP increasing above 150 mV) was observed at wells EKMW-12 and EKMW-13B approximately 7 weeks after persulfate addition was initiated at wells S10 and S11. Despite some fluctuations in pH and ORP at EKMW-14, no significant changes from baseline conditions were observed for either parameter at this well. It should be noted that the development of or shift to oxidizing conditions appears to have been impacted by the period of Phase 1 operations when potassium carbonate was used as the pH buffer and system uptime was significantly impacted. During this period of operations there was an apparent reversal in the decreasing pH and increasing ORP trends that were observed when potassium bicarbonate was used and system uptime was 85% or higher. As a result, it is possible that oxidizing conditions may have fully developed at wells EKMW-12, EKMW-13B and EKMW-14 (like they did at EKMW-11) had the supply of potassium bicarbonate not been disrupted.

Table 6-2. Groundwater Field Parameter Results

Well ID	Event ¹	Sample Date	Cumulative Volume Purged (gal)	Purge Rate (gpm)	Depth to Water (ft)	pH	Temperature (°C)	Conductivity (µS/cm)	Dissolved Orygen (mg/L)	Turbidity (NTU)	Oxidation Reduction Potential (mV)
	Baseline	11-Jul-19	0.25	0.08	5.80	5.21	28.33	6.873	0.79	25.7	35.5
	Baseline	07-Aug-19	0.25	0.08	6.35	5.69	28.36	6,934	1.82	12.5	67.0
	PM1	22-Oct-19	0.25	0.04	6.85	5.70	28.70	conductivity (μ S/cm) Oxyg ($mg/$) 33 6.873 0.7 36 6.934 1.8 70 6.320 0.6 83 8.740 0.6 55 6.783 0.6 83 8.740 0.6 55 6.783 0.6 6.6579 0.3 0.6 10 6.367 0.8 40 5.783 1.4 82 6.690 3.2 4 6.184 0.6 33 5.851 0.8 19 6.548 1.4 45 6.342 2.7 14 7.726 1.3 30 10.380 0.7 50 3.136 3.0 80 2.865 1.7 40 2.787 0.5 50 3.136 3.0 72 9.71 0.3 81 3.231 0.6 82 2.4	0.65	19.9	53.2
	PM2/UIC1	05-Nov-19	0.25	0.05	6.93	5.42	25.83		0.60	13.4	11.9
	PM3	19-Nov-19	0.25	0.03	6.98	5.38	26.65		0.66	6.87	33.8
	VOCs	25-Nov-19	0.25	0.03	7.10	3.61	25.36		0.39	14.6	360.9
	PM4	03-Dec-19	0.75	0.75	7.41	3.35	22.10		0.88	17.9	411.2
	PM5/Metals	18-Dec-19	0.25	0.08	6.15	3.02	22.40		1.40	6.06	484.5
EKMW-11	PM6	07-Jan-20	0.25	0.02	NM	5.22	23.82		3.28	11.6	332.7
	Field Parameters	24-Jan-20	NM	NM	NM	2.98	NM			NM	485.9
	PM7	28-Jan-20	0.25	0.08	6.22 6.45	2.98	23.33 24.29			9.85 20.9	442.4 528.2
	PM8 PM9/UIC2	11-Feb-20	0.25	0.05	6.94	2.65	24.29			12.9	528.2
	PM9/0102 PM10	25-Feb-20 10-Mar-20	0.25	0.00	6.52	2.05	23.14			12.9	587.3
	PM10 PM11	24-Mar-20	0.25	0.03	8.31	2.70	25.14			10.5	536.9
	PM11 PM12	07-Apr-20	0.25	0.04	6.35	3.20	25.50		0.78	29.0	531.5
	PM12 PM13	21-Apr-20	0.50	0.08	7.50	3.65	26.01		1.03	25.8	512.1
	O&M	08-May-20				3.66	25.50		3.01	18.6	471.1
	Baseline	11-Jul-19	0.25	0.06	6.15	5.72	29.87		0.32	10.4	-40.8
	Baseline	07-Aug-19	0.25	0.08	5.70	6.40	28.89		1.72	8.25	-38.3
	PMI	22-Oct-19	0.25	0.04	6.75	5.41	29.40	2,787	0.51	17.9	-12.5
	PM2/UIC1	05-Nov-19	0.25	0.05	7.45	5.97	25.95		0.82	22.9	-69.0
	PM3	19-Nov-19	0.25	0.03	7.70	5.79	26.76		0.39	13.4	-45.1
	VOCs	25-Nov-19	0.25	0.03	7.42	5.77	24.48	3,231	0.61	9.48	-17.4
	PM4	03-Dec-19	0.50	0.05	6.45	6.11	23.88		0.19	34.9	-28.5
	PM5/Metals	18-Dec-19	0.25	0.08	6.51	5.69	22.22		0.62	17.0	36.3
EKMW-12	PM6	07-Jan-20	0.25	0.03	NM	5.30	24.34		0.83	32.1	67.4
212110-12	Field Parameters	24-Jan-20	NM	NM	NM	4.82	NM		0.36	NM	156.3
	PM7	28-Jan-20	0.25	0.08	7.97	4.32	24.05	2,986	1.03	85.5	182.4
	PM8	11-Feb-20	0.25	0.03	9.00	4.17	26.03	?		11.9	225.6
	PM9/UIC2	25-Feb-20	0.25	0.06	6.82	4.18	23.19			10.7	213.1
	PM10	10-Mar-20	0.25	0.03	10.40 6.62	5.10	25.22			40.2	136.8 100.2
	PM11 PM12	24-Mar-20 07-Apr-20	0.25	0.03	4.90	5.47 5.15	26.64			28.9	97.2
	PM12 PM13	21-Apr-20	0.25	0.08	9.98	5.53	26.67			30.6	62.3
	O&M	08-May-20	0.25	0.05	9.96	5.66	26.07			13.6	57.0
	Baseline	11-Jul-19	0.25	0.06	7.10	5.86	29.48		0.20	8.81	-62.8
	Baseline	07-Aug-19	0.25	0.08	5.77	6.34	28.68		1.74	3.82	-5.4
	PM1	22-Oct-19	0.25	0.04	6.50	5.47	29.68		1.08	7.16	-17.5
	PM2/UIC1	05-Nov-19	0.25	0.05	6.27	5.82	26.07		0.56	12.3	-64.7
	PMB	19-Nov-19	0.25	0.03	7.48	5.71	26.24		0.37	7.45	-47.4
	VOCs	25-Nov-19	0.25	0.03	7.00	5.80	24.24		0.49	4.95	-19.6
EVA OF LAS	PM4	03-Dec-19	0.50	0.06	10.01	5.82	25.67		0.69	8.42	-24.5
EKMW-13B	PM5/Metals	18-Dec-19	0.25	0.08	5.68	5.71	23.45	3,010	0.68	26.8	38.0
	PM6	08-Jan-20	0.25	0.03	NM	4.74	21.93	3,073	5.40	51.3	138.0
	Field Parameters	24-Jan-20	NM	NM	NM	3.56	NM		0.51	NM	381.6
	PM7	28-Jan-20	0.25	0.08	8.19	4.09	23.62		1.01	24.6	235.7
	PM8	11-Feb-20	0.25	0.03	7.70	3.81	25.30		0.66	9.14	266.1
	PM9/UIC2	25-Feb-20	0.25	0.06	6.44	4.60	23.20		0.85	9.64	173.9
	PM10	10-Mar-20	0.25	0.03	5.80	4.96	24.55	4,034	1.12	40.3	176.0

Table 6-2. **Groundwater Field Parameter Results (Continued)**

OU3, NAS Jacksonville

			Cumulative Volume Purged	Purge Rate	Depth to		Temperature	Conductivity	Dissolved Orygen	Turbidity	Oxidation Reduction Potential
Well ID	Event ¹	Sample Date	(gal)	(gpm)	Water (ft)	pH	(°C)	(µS/cm)	(mg/L)	(NTU)	(mV)
	PM11	24-Mar-20	0.25	0.03	7.15	5.13	25.90	4,124	0.25	NM	139.7
EKMW-13B	PM12	07-Apr-20	0.25	0.08	4.82	5.37	26.70	3,748	0.98	9.62	93.9
(Cont'd)	PM13	21-Apr-20	0.25	0.05	9.80	5.54	26.95	3,550	1.83	5.76	59.0
	O&M	08-May-20		-		5.60	26.35	4,079	0.33	3.06	81.4
	Baseline	11-Jul-19	0.25	0.06	4.58	8.38	30.76	1,415	1.16	high	-3.7
	Baseline	07-Aug-19	0.25	0.08	6.18	7.18	28.97	2,535	1.78	62.5	-129.9
	PM1	22-Oct-19	0.25	0.03	17.06	7.17	29.70	1,339	1.72	28.9	-30.1
	PM2/UIC1	05-Nov-19	1.00	0.05	11.10	5.84	26.66	3,896	0.44	24.2	-115.9
	PM3	19-Nov-19	0.25	0.03	7.72	5.93	25.12	3,319	0.57	47.6	-58.1
	VOCs	25-Nov-19	0.25	0.03	6.40	5.84	24.77	3,383	0.34	400	-19.7
	PM4	03-Dec-19	1.00	0.04	12.68	6.42	22.53	2,576	0.40	14.6	-72.1
	PM5/Metals	18-Dec-19	0.25	0.05	5.81	6.07	22.41	3,067	1.16	5.97	-40.9
EKMW-14	PM6	08-Jan-20	0.25	0.03	NM	6.27	23.76	2,772	0.85	85.9	-33.0
Littinw-14	Field Parameters	24-Jan-20	NM	NM	NM	5.74	NM	2,508	0.52	NM	30.5
	PM7	28-Jan-20	0.25	0.05	8.47	5.80	22.51	2,446	1.12	11.1	-12.2
	PM8	11-Feb-20	0.25	0.03	8.70	5.71	25.48	2,788	0.58	18.6	-26.5
	PM9/UIC2	25-Feb-20	0.25	0.06	7.03	6.97	22.06	2,646	1.73	19.3	-25.1
	PM10	10-Mar-20	0.25	0.03	6.60	6.22	24.58	3,373	0.20	18.4	-34.8
	PM11	24-Mar-20	0.25	0.04	7.76	6.15	25.63	3,428	0.78	NM	-56.0
	PM12	07-Apr-20	0.25	0.08	4.74	6.07	26.17	3,044	1.05	7.02	-44.1
	PM13	21-Apr-20	0.25	0.05	10.70	6.11	26.15	2,874	1.63	15.6	-64.7
	O&M	08-May-20			-	6.23	26.83	3,147	0.35	8.3	-44.9

Notes:

¹ PM designates the performance monitoring sampling event (e.g., PM1 = performance monitoring sampling event 1); UIC designates the quarterly sampling event required by the UIC Approval Order (e.g., UIC1 = UIC sampling event for Q1)

gal - gallons gpm - gallons per minute ft - feet

°C - degrees celsius

µS/cm - microsiemens per centimetre

mg/L - milligrams per litre mV - milliVolts

NTU - Nephelometric Turbidity Units

NM - not measured

– no data available





Groundwater analytical results for various geochemical parameters included in the Dem/Val monitoring program are presented in **Table 6-3**. Temporal changes in concentrations of sulfur species (persulfate, sulfate and sulfur) and iron at the four EKMWs are shown on **Figure 6-5**. Consistent with the oxidizing conditions that developed at EKMW-11, increases in concentrations of persulfate, sulfate and sulfur were noted at this monitoring well. By the end of Phase 1 operations, the concentration of persulfate at EKMW-11 was roughly the same as the amendment supply concentration (i.e., 40 g/L), and the concentrations of sulfate and sulfur had increased by roughly 2 orders of magnitude. A decrease in the concentration of iron by roughly 1 order of magnitude was also observed at this location. Coupled with the field parameter data discussed above, these data suggest that in-situ activation of persulfate, likely due to the iron, was occurring in this area of the TTA.

At EKMW-12, the concentration of persulfate also increased to 100% of the amendment supply concentration by the end of Phase 1 operations, and the concentrations of sulfate and sulfur increased by roughly 1 order of magnitude. However, the decrease in the concentration of iron was not as significant as that observed at EKMW-11, and analytical results indicate that the baseline concentration of iron at EKMW-12 was lower than EKMW-11. Increases in the concentrations of persulfate at EKMW-13B and EKMW-14 were less noticeable, but concentrations still reached as high as 1% and 10% of the concentrations of persulfate added to wells S11 and S12, respectively. No significant changes in the concentrations of sulfate or sulfur were observed at either EKMW-13B or EKMW-14 throughout the Dem/Val.

Based on the persulfate concentrations observed, the following persulfate migration rates were estimated: EKMW-11 (0.6 cm/day), EKMW-12 (1.3 cm/day) and EKMW-14 (0.7 cm/day). Persulfate migration rates were calculated based on the period of time between the start of persulfate addition to the supply wells and the arrival of persulfate at the monitoring wells at concentrations greater than 10% of the amended concentration. A persulfate migration rate was not calculated for EKMW-13B since the concentration of persulfate at this well did not surpass 10% of the concentration added to well S12. A correction factor was also applied to the calculated migration rates to account for system uptime (i.e., persulfate migration rates assume 100% system uptime). These results suggest that while EK was effective at enhancing the migration of persulfate within the low-K clay unit of the TTA, the rate of persulfate migration was inhibited due to in-situ activation of the persulfate by naturally occurring subsurface conditions (e.g., elevated concentrations of iron).

6.2.2 Groundwater CVOCs

Groundwater analytical results for CVOCs are presented in **Table 6-4**, and temporal changes in concentrations of PCE, TCE, cDCE and VC at the four EKMWs are shown on **Figure 6-6**.

Table 6-3. Groundwater Geochemical Results

Well ID	Event ¹	Sample Date	Duplicate	Persulfate ^(a) (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium ^(b) (mg/L)	Magnesium ^(b) (mg/L)	Total Organic Carbon (mg/L)	Chloride ^(b) (mg/L)	Nitrate ^(b) (mg/L)	Nitrite ^(b) (mg/L)
	Baseline	11-Jul-19			42		96	3.5	330	68	3.6	2,400	0.02 U J	0.2 U J
	Baseline	07-Aug-19		0.7										
	PM1	22-Oct-19		80	37	14	90	4.5			2.4			
	PM2/UIC1	05-Nov-19		0.7	78	34	90	4.7			2.5			
	PM3	19-Nov-19		1.4	140 J	42	89	4.8			3.0			
	PM4	03-Dec-19		10	64	23	46	4.5			3.0 J			
	PM5/Metals	18-Dec-19		10	84	30	26	4.3			3.1 J			
	PM6	07-Jan-20		2.1	240	88	54	3.8			3.7			
	Field Parameters	24-Jan-20		45										
	PM7	28-Jan-20		45	360	130	36	3.9			3.4			
	PM8	11-Feb-20		28	430	160	29	4.4			3.3			
	PM9/UIC2	25-Feb-20		450	720	220	11	4.6			3.7			
	Persulfate	06-Mar-20		70										
	PM10	10-Mar-20		112	1000.00	790	2.9	5.4			4.4			
EKMW-11	Persulfate	13-Mar-20		250										
	Persulfate	16-Mar-20		700										
	Persulfate	20-Mar-20		300										
	Persulfate	23-Mar-20		3,000				-						
	PM11	24-Mar-20		1,400	2,300	1,200	4.5 J	6.2			5.6			
	Persulfate	27-Mar-20		10,000										
	Persulfate	03-Apr-20		3,000										
	PM12	07-Apr-20		2,500	3,400	1,500 J	4.5	7.2			7.5			
	Persulfate	10-Apr-20		70,000										-
	PM13	21-Apr-20			2,600	1,200 J	2.4 J	6.4			6.3			
	Persulfate	24-Apr-20		2,500										
	Persulfate	27-Apr-20		5,000										
	Persulfate	01-May-20		42,000									-	-
	Persulfate	04-May-20		56,000										
	O&M	08-May-20		56,000										-
	Baseline	11-Jul-19			49		35	2.9	280	51	6.3	820	0.02 U J	0.2 U J
	Baseline	11-Jul-19	Х		54		30	2.7	270	49	6.8	780	0.02 U J	0.2 U J
	Baseline	07-Aug-19		0.7 U				-				-		-
	PM1	22-Oct-19		0.7 U	14	6.1	28	2.7			2.4			
	PM2/UIC1	05-Nov-19		0.7 U	10	4.1 J	42	3.1			2.3			
EKMW-12	PM3	19-Nov-19		0.7 J	9.5	5.3	33	2.7			2.2			
EKWW-12	PM4	03-Dec-19		3.5	44	18	15	2.0			2.2 J			
	PM5/Metals	18-Dec-19		0.7 U	32	11	26	2.7			2.0 J			
	PM6	07-Jan-20		0.7 U	25	8.1	29	3.2			1.7			
	Field Parameters	24-Jan-20		0.7 U								-		
	PM 7	28-Jan-20		2.8	59	21	24	3.4			1.5			
	PM8	11-Feb-20		1.4	97	33	29	3.9			1.5			

Table 6-3. Groundwater Geochemical Results (Continued)

Well ID	Event ¹	Sample Date	Duplicate	Persulfate ^(a) (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium ^(b) (mg/L)	Magnesium ^(b) (mg/L)	Total Organic Carbon (mg/L)	Chloride ^(b) (mg/L)	Nitrate ^(b) (mg/L)	Nitrite ^(b) (mg/L)
	PM9/UIC2	25-Feb-20		1.0	90	34	34	4.0			1.5			
	PM10	10-Mar-20		7.0	77	29	41	3.8			1.6		-	
	Persulfate	13-Mar-20		500	-		-						-	
	Persulfate	16-Mar-20		2.8	-	-							-	
	Persulfate	20-Mar-20		5.0	-	-	-	-					-	
	Persulfate	23-Mar-20		5.0			-							
	PM11	24-Mar-20		2.1	260	97	41	3.7			1.9			
	Persulfate	27-Mar-20		100			-							
EKMW-12	Persulfate	03-Apr-20		100										
(Cont'd)	PM12	07-Apr-20		0.7	360	110	42	3.3			2.1			
(Cont d)	Persulfate	10-Apr-20		56,000	-							-		
	Persulfate	13-Apr-20		1.4										
	Persulfate	17-Apr-20		700										
	PM13	21-Apr-20		0.7	390	140 J	46 J	3.3			2.1			
	Persulfate	24-Apr-20		25										
	Persulfate	27-Apr-20		100										
	Persulfate	01-May-20		7,000										
	Persulfate	04-May-20		42,000										
	O&M	08-May-20		10			-							
	Baseline	11-Jul-19			170		21	2.7	320	55	8.6	820	0.02 U J	0.2 U J
	Baseline	07-Aug-19		0.7 U	41		39	3.5				930		
	PM1	22-Oct-19		0.7 U	35	13	32	2.7			3.3			
	PM1	22-Oct-19	X		40	14	33	2.8			3.6			
	PM2/UIC1	05-Nov-19		0.7 U	8.1 J	3.2 J	50 J	3.7 J			2.5 J		-	
	PM2/UIC1	05-Nov-19	X		120 J	57 J	20 J	2.2 J			4.9 J			
	PM3	19-Nov-19		0.7 U	28 J	78	28 J	2.3			2.3		-	
	PM3	19-Nov-19	X		57 J	77	20 J	1.8			2.4			
	PM4	03-Dec-19		1.4	140	46	20	2.3			2.8 J			
	PM4	03-Dec-19	X	-	140	46	19	2.3			2.9 J		-	
	PM5/Metals	18-Dec-19		4.2	50	17	23	3.1			2.1 J		-	
EKMW-13B	PM5/Metals	18-Dec-19	x		51	17	21	3.0			2.3 J		-	
	PM6	08-Jan-20		0.7 U	25	9	12	3.3			1.7			
	PM6	08-Jan-20	X	-	25	11	15	3.3			1.9			
	Field Parameters	24-Jan-20		1.0	-	-	-							
	PM7	28-Jan-20		2.1	15	5.5	8.4	3.5			1.6			
	PM7	28-Jan-20	x		15	5.5	8.8	3.5			1.6			
	PM8	11-Feb-20		0.7	31	12	28	4.1			1.5			
	PM8	11-Feb-20	X	-	32	11	28	4.1			1.5			
	PM9/UIC2	25-Feb-20		2.5	52	21 J	37	3.9			1.7		-	
	PM9/UIC2	25-Feb-20	x		56	20 J	38	4.0		-	1.6		-	
	PM10	10-Mar-20		1.4	67	25	34	3.7			1.7		-	

Table 6-3. Groundwater Geochemical Results (Continued)

Well ID	Event ¹	Sample Date	Duplicate	Persulfate ^(a) (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium ^(b) (mg/L)	Magnesium ^(b) (mg/L)	Total Organic Carbon (mg/L)	Chloride ^(b) (mg/L)	Nitrate ^(b) (mg/L)	Nitrite ^(b) (mg/L)
	PM10	10-Mar-20	Х		70	25	33	3.6			1.7			
	Persulfate	13-Mar-20		17							-			
	Persulfate	16-Mar-20		2.8	-		-	-		-				
	Persulfate	20-Mar-20		1.7	-			-		-			-	
	PM11	24-Mar-20		1.4	66	24	29	3.3			1.5			
	PM11	24-Mar-20	X		69	23	28	3.4			1.6			
	Persulfate	27-Mar-20		2.8										
EKMW-13B	Persulfate	03-Apr-20		5.0	-									
(Cont'd)	PM12	07-Apr-20		0.7	110	26	37	3.0	-		1.7			
	PM12	07-Apr-20	X		100	26	36	2.9		-	1.7			
	PM13	21-Apr-20	L		89	30 J	36 J	2.9			1.8			
	PM13	21-Apr-20	X		88	30 J	35 J	2.9			1.9			
	Persulfate	24-Apr-20		10	-									
	Persulfate	27-Apr-20		3.0	-			-		-				
	Persulfate	01-May-20		0.7	-					-				
	Persulfate	04-May-20		420										
	O&M	08-May-20		2.8						-				
	Baseline	11-Jul-19			450		1100**	15	770	270	4.0	39	0.051 J	0.02 U J
	Baseline	07-Aug-19		0.7 U				-		-				
	PM1	22-Oct-19		0.7	140	51	2.6	0.57			19			
	PM2/UIC1	05-Nov-19		0.7 U	200	67	30	2.7			16			
	PM3	19-Nov-19		0.7 U	360	120	44	3.6			33			
	PM4	03-Dec-19		0.7	200	76	17	2.9			19 J			
	PM5/Metals	18-Dec-19		0.7 U	710	260	46	4.3			28			
	PM6	08-Jan-20			420	140	21	3.2			29			
	Field Parameters	24-Jan-20		0.7 U										
	PM7	28-Jan-20		5.0	390	130	16	3.1			41			
	PM8	11-Feb-20		0.7 U	370	120	22	3.7		-	50		-	
	PM9/UIC2	25-Feb-20		5.0	410	150	29	3.6			50			
EKMW-14	PM10	10-Mar-20		0.7 U	410	150	35	3.6		-	49			
	Persulfate	13-Mar-20		7.0	-			-						
	Persulfate	16-Mar-20		0.7 U										
	Persulfate	20-Mar-20		0.7 U										
	PM11	24-Mar-20		0.7 U	400	160	44	3.6			45			
	Persulfate	27-Mar-20		4.2										
	Persulfate	03-Apr-20		0.7 U										
	PM12	07-Apr-20		0.35	480	140	42	3.4			39			
	PM13	21-Apr-20			410	150 J	40 J	3.5			44			
	Persulfate	24-Apr-20		0.7 U										
	Persulfate	27-Apr-20		0.7 U							-			
	Persulfate	01-May-20		2,800										
	Persulfate	04-May-20		3,500	-									
	O&M	08-May-20		2.8	-			-						

Table 6-3. **Groundwater Geochemical Results (Continued)**

OU3, NAS Jacksonville

Well ID	Event ¹	Sample Date	Duplicate	Persulfate ^(a) (mg/L)	Sulfate (mg/L)	Sulfur (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium ^(b) (mg/L)	Magnesium ^(b) (mg/L)	Total Organic Carbon (mg/L)	Chloride ^(b) (mg/L)	Nitrate ^(b) (mg/L)	Nitrite ^(b) (mg/L)
	Baseline	11-Jul-19			5.9		0.09 U	0.012 U	23	7.9	1.0 U	5	0.011 J	0.01 U J
	Baseline	07-Aug-19			-		0.09 U	0.012 U						
	PM1	22-Oct-19			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U		-	1
	PM3	19-Nov-19			0.15 U	4.5 U	0.09 U	0.012U			1.0 U			-
	PM4	03-Dec-19			0.09 J	4.5 U	0.09 U	0.012 U			1.0 U			-
	PM5/Metals	18-Dec-19			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
Field Blank	PM6	07-Jan-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
Field Dialik	PM 7	28-Jan-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
	PM8	11-Feb-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
	PM9/UIC2	25-Feb-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
	PM10	10-Mar-20			0.06 J	4.5 U	0.09 U	0.012 U			1.0 U			
	PM11	24-Mar-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
	PM12	07-Apr-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			
	PM13	21-Apr-20			0.15 U	4.5 U	0.09 U	0.012 U			1.0 U			

Notes:

Bold values indicate detected results

¹ PM designates the performance monitoring sampling event (e.g., PM1 = performance monitoring sampling event 1); UIC designates the quarterly sampling event required by the UIC Approval Order (e.g., UIC1 = UIC sampling event for Q1)

(a) Persulfate concentrations were determined in the field using Chemetrics test kit

(b) Analyte part of baseline characterization only

mg/L - milligrams per liter

μg/L - micrograms per liter DUP - Duplicate sample

---- Not analyzed

J - Estimated concentration

U - Not detected above the reporting limit listed

** Value suspected to be anomalous and was not included in the performance assessment



Figure 6-5. Temporal Changes in Groundwater Sulfur Species and Iron OU3, NAS Jacksonville

Table 6-4.Groundwater VOC Results

					Volatile Organic O	Compounds (µg/L) ^(a)	
Well ID	Event	Sample Date	Duplicate	PCE	TCE	cis-1,2-DCE	vc
	Baseline	11-Jul-19		6,700	2,000	3,900	62 J
1	VOCs	25 Nov-19		680	1,200	4,200	45 J
i i	PM5	18-Dec-19		430	650	3,400	24 J
1	PM6	07-Jan-20		2,000	1,500	4,600	220
1	PM7	28-Jan-20		2,100	1,300	2,800	130
EKMW-11	PM8	11-Feb-20		2,600	1,100	2,300	85 J
1	PM9/UIC2	25-Feb-20		3,400	1,200	2,300	52 J
1	PM10	10 Mar 20		2,600	950	1,700	25 U
1	PM11	24-Mar-20		1,300	430	1,200	1.7 U J
1	PM12	07-Apr-20		760 J	300	1,000	2.0 U J
1	PM13	21-Apr-20		1,200	410	1,400	2.0 J
	Baseline	11-Jul-19		6.3 J	7.2 J	280	2.0 J
1	Baseline	11-Jul-19	X	14 J	13 J	260	2.2 J
1	VOCs	25-Nov-19		7.2	16	300	39
1	PM5	18-Dec-19		4.8	9.4	200	19
ł	PM6	07-Jan-20		7.0	16	210	27
EKMW-12	PM7	28-Jan-20		12	20	160 J	22
	PM8	11-Feb-20		15	16	150	26
ŀ	PM9/UIC2	25-Feb-20		21	22	140	29
ŀ	PM11	24-Mar-20		9.5	16	130	28
ŀ	PM12	07 Apr 20		12	20	150	47
ŀ	PM13	21-Apr-20		9.2	17	140	61
	Baseline	11-Jul-19		94	15	140	0.31 J
ł	PM2/UIC1	05-Nov-19		2.4	4.0 J	250	0.75 J
ł	PM2/UIC1 PM2/UIC1	05-Nov-19	x	3.9	3.7 J	200	0.73 J
ł	VOCs	25-Nov-19	~	22	19	240	0.65 J
ŀ	PM5	18-Dec-19	v	11	9.7	170	0.62 J
ŀ	PM5	18-Dec-19	X	11	10	160	0.50 U
-	PM6	08-Jan-20	v	5.3	5.4	190	0.67 J
EKMW-13B (c)	PM6	08-Jan-20	X	6.6	6.8	150	0.70 J
-	PM7	28-Jan-20		15	12	120	0.95 J
	PM7	28-Jan-20	X	14	11	130	0.83 J
	PM8	11-Feb-20		21	14	120	1.2 J
	PM8	11-Feb-20	X	21	13	120	1.1 J
	PM9/UIC2	25-Feb-20		14	12	130	1.4 J
	PM9/UIC2	25-Feb-20	X	15	12	130	1.3 J
	PM13	21-Apr-20		39 J	23 J	110 J	1.7 J
	PM13	21-Apr-20	X	37 J	21 J	110 J	1.5 J
	Baseline	11-Jul-19		13 U	13 U	13 U	13 U
l.	VOCs	25-Nov-19		6.6	13	130	9,6
l.	VOCs	25-Nov-19	X	5.8	12	140	9,5
l	PM5	18-Dec-19		1.9	3.3	140	6,1
EKMW-14	PM6	08-Jan-20		1.2	2.1	98	3.9
[PM7	28-Jan-20		1.5 J	3.0 J	100	2.1
	PM8	11-Feb-20		0.35 J	0.92 J	100	2.2
[PM9/UIC2	25-Feb-20		5.0 U	5.0 U	110	5.3 J
	PM13	21-Apr-20		2.1 J	1.5 J	130	19
	Baseline	11-Jul-19		0.5 U	0.5 U	0.5 U	0.5 U
	Baseline	07-Aug-19		0.5 U	0.5 U	0.5 U	0.5 U
	PM5	18-Dec-19		0.5 U	0.5 U	0.5 U	0.5 U
1	PM6	07-Jan-20		0.5 U	0.5 U	0.5 U	0.5 U
1	PM7	28 Jan 20		0.5 U	0.5 U	0.30 J	0.5 U
Right Directo	PM8	11-Feb-20		0.5 U	0.5 U	0.5 U	0.5 U
Field Blank	PM9/UIC2	25-Feb-20		0.5 U	0.5 U	0.5 U	0.5 U
l	PM10	10-Mar-20		0.5 U	0.5 U	0.5 U	0.5 U
ŀ	PM11	24-Mar-20		0.5 U	0.5 U	0.5 U	0.5 U
	PM12	07-Apr-20		0.5 U	0.5 U	0.5 U	0.5 U
					N.0 W		N.N. W.
ŀ	PM13	21-Apr-20		0.5 U	0.5 U	0.33 U	0.5 U

Table 6.4 Groundwater VOC Results (Continued)

				Volatile Organic Compounds (µg/L) ^(a)						
Well ID	Event	Sample Date	Duplicate	PCE	TCE	cis-1,2-DCE	VC			
	Baseline	11-Jul-19		0.5 U	0.5 U	0.5 U	0.5 U			
	Baseline	11-Jul-19		0.5 U	0.5 U	0.5 U	0.5 U			
	Baseline	07-Aug-19		0.5 U	0.5 U	0.5 U	0.5 U			
	VOCs	25-Nov-19		0.5 U	0.5 U	0.5 U	0.5 U			
	PM5	18-Dec-19		0.5 U	0.5 U	0.5 U	0.5 U			
	PM6	07-Jan-20		0.5 U	0.5 U	0.5 U	0.5 U			
Trip Blank	PM7	28-Jan-20		0.5 U	0.5 U	0.5 U	0.5 U			
	PM8	11-Feb-20		0.5 U	0.5 U	0.5 U	0.5 U			
	PM9/UIC2	25-Feb-20		0.5 U	0.5 U	0.5 U	0.5 U			
	PM10	10-Mar-20		0.5 U	0.5 U	0.5 U	0.5 U			
	PM11	24-Mar-20		0.5 U	0.5 U	0.5 U	0.5 U			
	PM12	07-Apr-20		0.5 U	0.5 U	0.5 U	0.5 U			
	PM13	21-Apr-20		0.5 U	0.5 U	0.5 U	0.5 U			

OU3, NAS Jacksonville

Notes:

Bold values indicate detected results

(a) Volatile organic compounds (VOCs) analyzed by EPA Method 8260B

PCE - Tetrachloroethene

TCE - Trichloroethene

cDCE - cis-1,2-Dichloroethene

VC - Vinyl Chloride

µg/L - micrograms per liter J - Estimated concentration U - Not detected above the reporting limit listed


Figure 6-6. Temporal Changes in Groundwater CVOCs

OU3, NAS Jacksonville

At EKMW-11, despite some fluctuations in the data, concentrations of CVOCs decreased throughout Phase 1 operations. By the end of the Dem/Val, overall reductions in PCE, TCE, cDCE and VC ranged from approximately 64% (cDCE) to more than 95% (VC). A temporary rebound in the concentration of PCE was observed during the period of system operations when potassium carbonate was used as the pH buffer and system uptime was significantly reduced, but PCE concentrations then decreased once the supply of potassium bicarbonate was restored and system uptime increased to above 90%. These reductions in CVOC concentrations are attributed to treatment *via* chemical oxidation from the persulfate that was distributed and naturally activated in this area of the TTA.

Some treatment of CVOCs was also observed at the other EKMWs, however the extent of CVOC treatment was not as considerable as that observed at EKMW-11. Reductions in the concentrations of PCE at wells EKMW-12, EKMW-13B and EKMW-14 ranged from approximately 34% (EKMW-12) to 84% (EKMW-14). However, the baseline PCE concentrations at these locations were approximately two orders of magnitude lower than the PCE concentration at EKMW-11 (at which the concentration of PCE was reduced by approximately 82% by the end of the Dem/Val). TCE concentrations also decreased at all locations except EKMW-12, with reductions ranging from 73% (EKMW-13B) to 89% (EKMW-14). At EKMW-12, TCE concentrations remained stable throughout Phase 1 operations and were consistent with baseline. All four EKMWs displayed an initial increase in the concentration of cDCE compared to baseline concentrations, but concentrations then decreased over the course of the Dem/Val. By the end of the Dem/Val, reductions in cDCE concentrations (versus peak cDCE concentrations) ranged from approximately 7% (EKMW-14) to 70% (EKMW-11).

As noted above, the greatest extent of CVOC treatment was observed at EKMW-11. This finding is consistent with the oxidizing conditions and strong presence of sulfur species observed at this well. While the other EKMWs (EKMW-12, EKMW-13B and EKMW-14) showed more variable trends in the concentrations of specific CVOCs, PCE and TCE were generally observed to decrease at these wells following implementation of EK operations and persulfate addition at the respective supply wells.

Collectively, the performance monitoring groundwater data collected during the Dem/Val suggest that EK operations were successful in enhancing the delivery and distribution of persulfate within the TTA (at varying rates and amounts). Furthermore, in-situ activation of the distributed persulfate in some areas of the TTA, likely due to elevated concentrations of iron, led to the development of oxidizing conditions and overall reductions in the concentrations of CVOCs in these areas.

7.0 PERFORMANCE ASSESSMENT

This section provides an assessment of the performance of the Dem/Val relative to the performance objectives previously discussed in Section 3. Each subsection discusses the performance relative to an individual performance objective.

7.1 DEMONSTRATE UNIFORM DISTRIBUTION OF PERSUFLATE

The success criteria for this performance objective include:

Criterion

Evidence of persulfate transport to all monitoring wells locations located within the TTA following the EK migration phase.

As presented in **Table 6-3** and **Figure 6-5**, increases in the concentrations of persulfate were observed at all four EKMWs during the Dem/Val, and by the end of Phase 1 operations persulfate was detected at all four EKMWs at concentrations ranging from 1% to 100% of the amendment supply concentration. Increases in the concentrations of sulfate and sulfur by as much as 1 to 2 orders of magnitude were also observed at wells EKMW-11 and EKMW-12.

The Dem/Val has met this criterion.

Criterion

Persulfate transport rate greater than 2.5 cm/day.

Calculated persulfate migration rates ranged from approximately 0.6 cm/day to 1.3 cm/day. However, the rate of persulfate migration was inhibited due to in-situ activation of the persulfate by naturally occurring subsurface conditions (e.g., elevated concentrations of iron).

The Dem/Val has partially met this criterion.

Criterion

No focusing of electric field in any areas (electrical gradient between well pairs no more than 5x of average gradient between all well pairs).

As shown in **Figure 6-3**, voltage measurements at discrete locations within the TTA were between 5.9V and 21.9V indicating that an electric field was established in the area between electrode wells. Voltage gradients between discrete locations of closest well pairs were calculated and ranged from 0.34 V/m to 0.65 V/m and were approximately 100x below the target estimated voltage gradient of 0.5 V/cm (or 50 V/m). The variation in voltage gradients between well pairs was generally <10%, indicating that the established voltage gradients were relatively uniform and no local focusing of the electric field was encountered within the TTA.

The Dem/Val has met this criterion.

Criterion

Electrical potential gradient between electrode pairs maintained at level no more than 5x of target gradient at design current.

The EK system was designed and operated at a constant current, determined after the start-up period, during system operations. As presented in **Figure 6-1**, the voltage required of the DC power supply unit was generally consistent during periods of constant current, except for a few occasions when electrodes need cleaning. The electrical current supplied to individual wells during periods of constant current was generally steady (variation within 30% of average). Given that (i) soil electrical resistivity is a soil property not expected to vary over the course of Dem/Val, and (ii) the voltage output by the DC power supply unit and the current supplied to individual electrodes were generally steady, the electrical potential between electrode pairs within the TTA should maintain within 5x of target during operation.

The Dem/Val has met this criterion.

7.2 QUANTIFICATION OF EK SYSTEM OPERATIONAL PARAMETERS

The success criteria for this performance objective include:

Criterion

System operational conditions (voltage, current) within $\pm 50\%$ of the final designed target voltage and current.

As discussed in Section 6.1 and Section 7.1 (criterion related to electrical gradient) and presented in **Figure 6-1**, the operating voltage and current remained relatively steady except when electrodes needed cleaning. Excluding these periods of temporary unstable readings, the overall system operation conditions were steady and within 50% of the average during each normal operation period. The Dem/Val has met this criterion.

Criterion

Persulfate supply uptime greater than 75% of target.

As discussed in Section 6.1, system uptime was at least 85% during the periods when potassium bicarbonate was used to control pH in the electrode wells (i.e., a total of roughly 5 months out of the 7-month operations period). During these periods, system downtime was predominantly a result of the weekly site visits for O&M and/or groundwater sampling, in which case the *DC* power supply was manually turned off in order to protect the health and safety of field staff during these activities. The Dem/Val has met this criterion.

Criterion

Energy consumption with $\pm 30\%$ *of the design estimate.*

The EK system was designed and operated at a constant current, determined after the start-up period, during system operations. Given that the energy consumption is a function of voltage and current and, as discussed above regarding the steady system operation condition criterion, the overall system operations were steady and, thus, energy usage was also steady. The Dem/Val has met this criterion.

Criterion

Electrode function is maintained for at least one full cycle of EK-TAP.

As discussed in Section 5.1, only the first phase of testing (i.e., Phase 1 dipole test) was completed as a result of federal budget constraints. Other than a few occasions when the electrodes in the cathode wells needed to be cleaned, electrode function was maintained throughout system operations. The Dem/Val has met this criterion.

7.3 SAFE AND RELIABLE OPERATION, AND EASE OF TECHNOLOGY IMPLEMENTATION

The success criteria for this performance objective include:

Criterion

Operation conditions remain stable within the normal designed ranges over the course of the demonstration period.

As discussed in Sections 7.1 and 7.2 above, the overall operational conditions remained relatively steady over the course of the Dem/Val. The Dem/Val has met this criterion.

Criterion

No Lost-Time Incidents (LTIs)

There were no safety-related LTIs. The Dem/Val has met this criterion.

Criterion

Ability to construct using conventional techniques and contractors.

The Dem/Val involved only conventional field construction techniques, including well drilling, well installation, and piping, as well as remediation system electrical connections performed by a qualified electrical subcontractor. The Dem/Val has met this criterion.

Criterion

A single field technician able to effectively monitor and maintain normal system operation.

During system operations, one field technician performed routine system O&M tasks roughly twice per week with approximately 4 hours per visit. During the routine O&M visit, the tasks primarily included system visual inspections, recording the system operational parameters (voltage, current, amendment flow and pressure, etc.), and replenishing amendment solutions as needed. Additional system monitoring was completed remotely. Groundwater sampling events were also completed by one field technician. Over the course of system operations, there were fewer than 5 scheduled O&M events that involved two field technicians. The Dem/Val has met this criterion.

8.0 COST ASSESSMENT

This section provides cost information that a remediation professional could use to reasonably estimate the costs for implementing EK-TAP at a given site. Because the heating and persulfate activation stage of the EK-TAP technology was not performed for this Dem/Val, the cost analysis is based on *actual* costs of the tasks completed for this Dem/Val and *estimated* costs to complete the heating and persulfate activation portion of the technology based on experience at other sites where EK-TAP has been applied. Where appropriate, cost information has also been supplemented with reasonable estimates based on the team's experience from similar projects at other sites.

It should also be noted that the footprint of the TTA for this Dem/Val was purposely designed to be smaller than the footprint of most source areas at other sites in order to facilitate a phased testing approach. Based on our experience at other sites, the size of the area(s) requiring treatment will likely be larger than the TTA footprint in this Dem/Val. Nonetheless, the information presented below is considered useful for developing costs estimates of the EK-TAP technology at other sites.

8.1 COST MODEL

A cost model was developed to assist remediation professionals in understanding costs associated with the EK-TAP technology. The cost model identified the major cost elements required to implement the EK-TAP technology at a typical site with a CVOC (e.g., PCE) source area. **Table 8-1** presents a summary of cost elements and the cost tracking (where appropriate). Select cost elements are briefly discussed.

Table 8-1. Cost Model for EK-enhanced Amendment Delivery In-Situ Remediation

(For a Source Area Measuring 25 ft by 5 ft by 5 ft Thick [i.e., approximate footprint of the TTA in this Dem/Val])

Cost Element	Tracked During the Demonstration or Estimated Based on Experience at Other Sites	Costs
Bench-scale oxidant demand and EK Column Test	 Aquifer sediment materials provided by NAS Jacksonville. Laboratory bench-scale oxidant tests – \$3K Laboratory bench-scale EK column tests – \$20K 	\$23K
Remedial Design	 Professional labor for system design and demonstration plan – \$80K 	\$80K
Remediation Construction	 Utility locates and well installation subcontractors – 7 electrode/supply wells and 4 monitoring wells; \$20K EK system construction subcontractor - \$160K Site construction subcontractor - \$50K Field construction oversight and system shakedown professional labor (~7 weeks) - \$40K 	\$270K
Baseline characterization (soil / groundwater)	 Field staff labor - \$6K Laboratory analytical costs - \$6K 	\$12K

Cost Element	Tracked During the Demonstration or Estimated Based on Experience at Other Sites	Costs
Remediation System Operation & Maintenance	 Field O&M subcontractor – over 16 months of active operation (assumes 2 EK-TAP treatment cycles), \$45K Materials – persulfate, \$5K Materials - buffer and other chemicals, \$3K Materials - system parts & consumables, \$4K Professional labor for startup and scheduled O&M visits - \$20K 	\$77K (about \$5K/month)
Field Sampling (soil / groundwater)	 Performance monitoring groundwater sampling: up to 8 rounds of comprehensive sampling events and 8 rounds of limited scale sampling events; no cost tracking Standard soil and groundwater sampling activities; no cost tracking Field sampling staff labor; no cost tracking Laboratory analytical costs; no cost tracking 	NA (dependent on system design and regulatory requirements)-
Waste disposal	• NAS Jacksonville provided waste disposal; no cost tracking	NA
Reporting & Other Compliance Requirements	• Project reporting and meetings; no cost tracking	NA

 Table 8-1.
 Cost Model for EK-enhanced Amendment Delivery In-Situ Remediation

8.1.1 Cost Element – Bench-scale Testing

For this Dem/Val, several laboratory treatability studies were performed during the site selection/re-selection process to assess the applicability of the EK-TAP technology for the OU3 area at NAS Jacksonville. It is recommended that bench-scale testing be considered as part of the remedial design for an EK-enhanced remedy. The scope of bench testing can vary depending on the test objectives. For example, the bench test can be designed to estimate oxidant demand only (for EK-ISCO or EK-TAP), or to include an assessment of amendment transport rate and treatment effectiveness (for all EK-enhanced remedies). Therefore, the costs of bench testing can vary based on the scope and objectives but will typically range between \$3,000 to \$40,000.

8.1.2 Cost Element – Remediation Construction

For this Dem/Val, no special drilling or field construction methods were required. System components, including amendment supply systems, a power supply system, and process controls were housed in two 20-foot trailers that were constructed by a remediation system vendor in accordance with the project-specific design. No special equipment or parts, other than off-the-shelf commercial products, were required for the EK system. The electrodes and *DC* power supply unit were also commercially available products, as where the persulfate and pH buffer amendments. During the Dem/Val there were specific requirements regarding the chemical composition of the pH buffers, but in our experience this was a unique situation and in most cases the regulatory requirements for addition of chemical amendments for an EK-TAP remedy should be similar to the regulatory requirements for addition of chemical amendments for other "typical" in-situ remediation technologies.

The EK system construction costs will vary depending on the project scale (e.g., number of electrode wells needed to cover a treatment area, number of electrodes used, etc.) and site conditions (e.g., the extent of instrument automation due to site access, iron fouling and control measures due to geochemistry, etc.). However, the cost increase for expanding an EK system at a site will typically be marginal, with the cost increase primarily related to additional wells and parts (e.g., electrodes, valves, and pipe fittings, etc.). The EK Control trailer used for this Dem/Val could have been capable of incorporating up to 10 electrode wells, thereby expanding the treatment footprint (for the electrode spacing used) by approximately 200%.

8.1.3 Cost Element – Remediation System Operation and Maintenance

The system O&M costs can vary depending on the extent of instrument automation and site conditions and restrictions. For this Dem/Val, routine O&M tasks were performed by regular remediation field technicians without needing special personnel. The material costs for chemicals and system consumables are project-specific but generally scalable. Professional labor costs for field tasks during this Dem/Val were associated with system installation, start-up, operations maintenance, and performance monitoring.

8.2 COST DRIVERS

Based on the information and experience obtained from this Dem/Val and application of the EK-TAP technology at other sites, there are three main cost drivers to consider when evaluating implementation costs in future projects, including: (i) footprint, depth interval, and volume of target treatment zone and contaminant mass; (ii) presence and location of above-ground and subsurface utilities; and (iii) site geochemistry, particularly pH and iron. These are also the same cost drivers for many other in-situ remediation technologies and not unique to EK technology implementation. Each of these cost drivers is discussed below.

8.2.1 Cost Driver – Target Treatment Zone and Contaminant Mass

As for most remediation technologies, the size and volume of the target treatment zone as well as the amount of contaminant requiring treatment significantly affects the overall remediation costs. Particularly, the drilling and well installation costs for system wells (electrode wells and supply wells) vary based on the number and depth of these wells needed to adequately address the treatment zone. The spacing between electrode wells designed for this Dem/Val was approximately 12 ft, with supply wells located within the electrode well network. This level of well spacing, coupled with the phased operation program and the duration of operations, can be considered as within ranges of normal design for this technology. However, as previously noted the footprint of the TTA for this Dem/Val was purposely designed to be smaller than the footprint of most source areas at other sites in order to facilitate a phased testing approach.

For this Dem/Val, only the first stage of the EK-TAP technology (i.e., EK-enhanced delivery of persulfate) was tested during Phase 1 operations, which lasted approximately 7 months. However, operations lasted several months longer than anticipated due to issues with the supply of pH buffer chemicals. The need for a second treatment cycle will also depend on the contaminant mass remaining at the end of the first treatment cycle and the required mass reduction goal.

While there is no technical limit for applying EK technology in terms of depth, the costs for well construction increase as the depth of target treatment zone increases. The depth interval (thickness) of the target treatment zone may affect the number of electrodes within an electrode well and, therefore, the overall number of electrodes needed. A target treatment zone of shallow depth may need additional measures and costs related to utility protection as discussed below.

8.2.2 Cost Driver – Utilities

As with other active remediation technologies, a power source is required for this technology. Although not yet tested, the energy demand and the electrical operation conditions (voltage and current) demonstrated in this Dem/Val suggest that solar energy with battery units may be a feasible option.

Special considerations are warranted at sites with metallic subsurface infrastructure or subsurface utilities that may be electrically conductive. This evaluation should take into account the vertical separation of the electric field and the utility of concern. If needed, cathodic protection measures can be considered which can increase the implementation costs. In general, the EK technology is best suited for sites where the target treatment zone is deeper than 8 ft bgs (i.e., below utilities and conduits) and the groundwater table is below 5 ft bgs, otherwise special design considerations are needed.

8.2.3 Cost Driver – Site Geochemistry

Concentrations of iron and other major cations (e.g., calcium and magnesium) in groundwater is an important factor that can affect the costs of system construction and O&M. While iron is an important factor for most in-situ remediation technologies, it requires a special consideration when implementing an EK remedy because the cathodes will attract and concentrate iron and cations in the cathode wells, at least temporarily. The EK system for sites with elevated concentrations of these cations will also need to be sized and equipped with adequate units for handling the anticipated amount of precipitates. More robust O&M programs and efforts will also need to be considered for such sites. Over the course of implementation, the O&M issues related to these major cations should diminish.

In the case of EK-TAP, high levels of iron may result in activation of the persulfate which can lead to slower persulfate migration rates and extended remediation timeframes. However, in-situ activation of the persulfate can also result in treatment of target CVOCs which may preclude the need for activation of the persulfate *via* a subsequent heating stage and/or the need for a second treatment cycle.

8.3 COST ANALYSIS

Table 8-2 provides a cost comparison between EK-TAP, conventional direct-injection ISCO, hydraulic fracturing direct push technology (DPT) injection of zero-valent-iron (ZVI), and ERH thermal treatment for a typical CVOC source site in low-K materials. The key characteristics of the framework site are as follows:

- The site characterization and conceptual site model have been completed. The characterization of the target treatment area is sufficient and no additional pre-design investigation data are needed to support the remedial design;
- The footprint of TTA is approximately 80 ft x 80 ft;
- The depth interval of the TTA is between 10 and 30 ft bgs;
- Geology consisting of mainly fine-grained clayey material ($K_h < 10^{-6} \text{ cm/s}$);
- CVOC mass (chlorinated ethenes) is approximately 500 lbs;
- Treatability testing has been completed to support remediation design. Results of the treatability testing demonstrate the ability of EK to successfully migrate persulfate in site soils with persulfate migration rates >2.5 cm/day, and of EK-TAP to degrade the target CVOCs to below the target treatment criteria. The results also demonstrate that the levels of iron in site soils should not unduly activate the persulfate and prevent its delivery to the TTA using EK;
- The site has available potable water supply and adequate power utility; and
- No concerns for site access, subsurface obstruction, electrical interference or corrosion.

Estimates of the full-scale implementation costs and key assumptions associated with each technology for which the estimated costs are developed are presented in **Table 8-2**. Given that performance monitoring requirement is highly project-specific, the estimated costs are presented with and without the costs for performance monitoring. These estimates are prepared at the level of a feasibility study (e.g., +50%/-30%) for a cleanup site.

For baseline comparison, the cost of excavation with offsite disposal was also estimated. The feasibility-level cost estimate for an excavation-disposal option is in the range of \$1,300,000 to \$1,500,000. This estimate assumes that 50% of the excavated volume would need to be managed as hazardous waste. If more than 50% of the excavated volume is deemed hazardous, the costs for implementing this remedial option would increase significantly.

Cost Element	Tasks	Excavation - Disposal	EK-TAP	Injection ISCO	Hydraulic Fracturing DPT Injection ZVI	ERH	Descriptions / Assumptions
Remedial Design and Permitting	Design, project workplans, UIC permit ERH – also needs air permit, water discharge permit	\$50K	\$70K	\$50K	\$65K	\$80K	NA
	 EK-TAP – Well installations Site construction; utilities EK system & control center fabrication / mobilization / field connections Professional field oversight and system shakedown/startup 		1. \$53K 2. \$140K 3. \$175K 4. \$60K				 25 electrode wells and 15 supply wells; 4-inch PVC wells Electrode well spacing at ~ 18 ft Two electrodes vertically spaced in each electrode well One EK control / amendment supply system
Remedial Construction (*Excavation-disposal and hydraulic fracturing DPT ZVI injection costs presented in Remediation System Operation & Maintenance below)	Injection ISCO – 1. Well installations 2. Site construction; utilities 3. Injection system mobilization / field connections 4. Professional field oversight and system shakedown/startup			1. \$70K 2. \$35K 3. \$20K 4. \$40K			 49 injection wells; 2-inch PVC wells Injection well spacing at ~ 13 ft Injection ROI at ~ 7 ft Up to three injection manifolds are constructed Area is accessible during injection, and no trenching is required
	 ERH – 1. Well installations 2. Site construction; utilities 3. ERH system mobilization / field connection / system shakedown/startup 4. Professional field oversight 					1. \$92K 2. \$180K 3. \$190K 4. \$60K	 25 electrode wells and 25 co-located vapor recovery wells Electrode well spacing at ~ 18 ft A surface cap will not be required Include a 20-hp vapor extraction blower Adequate power supply is available for a 500-kW power unit
Remediation System Operation & Maintenance	Excavation with Off-site Disposal – 1. Excavation 2. Dewatering 3. Off-site disposal of soil and water 4. Backfill 5. Professional field oversight	\$1,250K to \$1,450K					 7,000 CY excavated volume 150,000 gallons dewater volume 50% excavated volume as hazardous 25 miles to disposal facility

Table 8-2. Cost Model for Full-Scale Implementation of Select Source Area Remediation Technologies

	 EK-TAP – Materials – chemicals Materials – parts and supplies Labor – O&M operator Labor – professional Utilities – water and electrical power 		 \$60K to \$75K \$25K to \$40K \$65K to \$95K \$50K to \$75K \$7K to \$10K 				 Sodium persulfate and pH buffer chemical amendments Approximately up to 3A current between each pair of cathode and anode Four treatment cycles over two years; each cycle is four months of active EK operation followed by one month of heating and one month cool-down; a 3rd year is assumed for contingency Less than 5,000 kW-hr electrical energy required for EK operation; less than 10,000 kW-hr electrical energy required for heat activation of distributed persulfate Weekly visit by a system operator; up to three major O&M events
Remedial System Operation & Maintenance	Injection ISCO – (injection rate from 0.75 gpm to 1 gpm) 1. Injection system rental 2. Materials – chemicals 3. Labor – field injection 4. Utilities – water and electrical power 5. Reinjection – 2 reinjection events			1. \$25K to \$30K 2. \$65K 3. \$60K to \$90K 4. \$5K 5. \$155K to \$190K x 2 events			 Sodium persulfate as oxidant, sodium hydroxide for base activation of persulfate Achievable injection rate from 0.75 gpm to 1 gpm Up to two re-injection events over a period of five years
	 Hydraulic Fracturing DPT Injection ZVI – 1. Injection vendor all labor/material inclusive costs 2. Professional oversight 				1. \$695K to \$845K 2. \$30K		 25 DPT injection points; ROI ~12 ft; spacing ~ 20 ft 7 fractures per DPT location (~ 3 ft depth interval per fracturing) 1.5% wt ZVI to soil mass (total ZVI mass = 210,000 lbs) 20 to 25 days of field injection
	 ERH - System rental and system operator Labor - professional oversight Utilities - electrical power Permit monitoring (air and condensate) Waste (activated carbon) disposal 					1. \$360K 2. \$24K 3. \$114K 4. \$30K 5. \$53K	 Total heating time of 180 days Approximately 142,000 kW-hr electrical energy needed Approximately 8,000 lb of activated carbon for regeneration/disposal Vapor and condensate sampling and analysis in compliance with permits
(no perfo	Estimated Total prmance monitoring costs)	\$1,300K - \$1,500K	\$705K - \$793K	\$680K to \$785K)	\$790K - \$940K	\$1,183K	

 Table 8-2.
 Cost Model for Full-Scale Implementation of Select Source Area Remediation Technologies (Continued)

Remediation Performance Monitoring	EK-TAP – Semi-annual groundwater monitoring for 3 to 4 years; Final soil sampling Injection ISCO – Semi-annual groundwater monitoring for 5 years; Final soil sampling Hydraulic fracturing DPT ZVI Injection – Semi-annual groundwater monitoring for 3 years; Final soil sampling ERH – Two semi-annual groundwater following the active operation; Final soil sampling		\$190K - \$240K	\$290K	\$190K	\$90K	For costing purpose, assumes: \$25K per semi-annual groundwater monitoring event; \$40K for final soil sampling event.
Estimated Total (w	ith performance monitoring costs)	\$1,300K - \$1,500K	\$895K - \$1,033K	\$970K - \$1,075K*	\$980K - \$1,130K	\$1,273K	

Table 8-2. Cost Model for Full-Scale Implementation of Select Source Area Remediation Technologies (Continued)

Based on the cost estimates presented in **Table 8-2**, EK-TAP can be potentially more cost favorable to an ERH remedy or excavation and disposal. The cost saving of EK-TAP compared to ERH is smaller when factoring in the monitoring costs because ERH can complete the remediation within a shorter timeframe (approximately 6 months with ERH compared to approximately 2 to 3 years with EK-TAP for the framework site). However, the energy usage required for EK-TAP is significantly less than the energy usage for ERH, resulting in a much more favorable environmental performance of EK-TAP over ERH.

The feasibility and effectiveness of the direct-injection ISCO approach is highly dependent on whether direct injection can achieve a reasonable injection rate and a reasonable radius of influence (ROI) in the low-K target treatment area of the framework site. For cost estimating purpose, an injection rate of 0.75 gallons per minute (gpm) to 1 gpm and a ROI of 7 ft are assumed; it is possible that at certain low-K sites these assumed injection rates and ROI may not be achievable. The estimated costs for direct-injection ISCO are presented in **Table 8-2** as a range based on injection rates. The estimated cost for the EK-TAP approach is comparable to that of direct-injection ISCO when factoring in the costs for ISCO reinjections (assuming two reinjections over five years). When accounting for the performance monitoring costs, which depend on the overall timeframe of the remedy, EK-TAP is potentially a more cost favorable alternative to direct-injection ISCO. Therefore, at sites where low-K material and/or high-degree of heterogeneity limits the feasibility of applying direct injection, EK-TAP can provide a cost-effective solution for implementing ISCO using persulfate.

Fracturing DPT injection has an overall estimated cost slightly higher than EK-TAP. Certain site conditions may present more constraints for fracturing DPT injection than EK-TAP, such as sensitive subsurface utilities or a shallow treatment zone close to ground surface. While fracturing DPT technology can enhance aquifer permeability, if a target treatment zone is in a heterogeneous formation, the fracturing technique may still result in non-uniform distribution of injected amendment. Alternately, the depth interval for fracturing will need to be reduced, with associated increased costs to achieve uniform distribution.

9.0 IMPLEMENTATION ISSUES

EK-TAP is a variation on standard ISCO using persulfate, whereby EK is used to more effectively deliver the persulfate through low-K materials. In addition, EK-TAP utilizes the same infrastructure to heat the treatment zone to the activation temperature of persulfate. Implementation of the heating stage for EK-TAP is similar to ERH, albeit with much lower subsurface temperatures. As such, there are only a few additional requirements or implementation issues that need to be addressed beyond those typically encountered with standard ISCO and ERH implementations. Some areas where additional attention may be required, on a site-specific basis, include:

- Safety considerations related to potential stray current/voltage to surface. To address this question during the Dem/Val, the current and voltage at the surface steel structures located within the treatment area (e.g., trailers, perimeter fencing, well manhole steel covers, etc.) where measured while the EK system was in operation to confirm that there was no safety concern. Depending on the project site, and for sensitive and active facilities with dedicated safety departments, additional design and explanation effort may be required for project approvals.
- Iron fouling of filters and valves along the extraction piping. During this Dem/Val, minimal fouling of filters and valves was observed, but routine maintenance was required to minimize potential flow restrictions within the conveyance lines. Scaling of the cathodes also required maintenance actions to clean the cathode surface. The presence of iron within target treatment zone resulted in activation of the persulfate which reduced the persulfate migration rate and extended the duration of operations. However, in-situ activation of the persulfate also resulted in some treatment of the target CVOCs, which could have reduced the effort required for a subsequent heating stage had heating been performed during the Dem/Val.
- Although not encountered during this Dem/Val, corrosion of metallic parts with the system piping and at wellheads fittings may occur with elevated chloride concentrations. This can be mitigated by minimizing the amount of metallic wetted parts within the system and instead using components with plastic wetted parts.
- The technology implementation did not require specialized/proprietary equipment. We used only standard commercial off-the-shelf equipment. We designed the manifold and control system and had a remediation system vendor assemble the system per design, but the overall system was similar to other "typical" in-situ remediation technologies. There were specific regulatory requirements regarding the chemical composition of the pH buffers used in this Dem/Val, but in our experience at other sites this was a unique situation and in most cases the requirements for addition of chemical amendments for an EK-TAP remedy should be similar to the requirements for addition of chemical amendments for other "typical" in-situ remediation technologies.
- If the technology is to be implemented near (laterally and/or vertically) utilities that are "sensitive" to electric interference where there are concerns with corrosion, some protection measures, such as cathodic protection, may be considered.

• No special regulatory requirements or permits beyond what are typical for other ISCO projects such as UIC permit. Depending on the locality-/facility-specific requirements, local or facility power/electrical departments should be consulted, and local HazMat response departments should be informed about the use of a chemical oxidant at the project site.

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APPENDIX A GROUNDWATER SAMPLING FORMS

Appendix A Groundwater Sampling Forms

SITE NAME:	NAS :	JAX EI	C TAP			TE DCATION:	Jackson	nville,	FL		
WELL NO	EK	MW - 1		SAMPLE I): E	KMW-	1		DATE:	7/11/	2019
					PURC	SING DA	TA				
	R (inches): 2		TER (inches):	1/4 DEPT	H: / 9 fe		STATIC D eet TO WATE	ER (feet): 4	. 10 OR	RGE PUMP T' BAILER:	PP PP
	LUME PURGE: ut if applicable)	1 WELL VO	LUME = (TO	TAL WELL DEPTI	H – STA eet –		O WATER) X		gallons/fo	ot =	gallons
	INT VOLUME P ut if applicable)	URGE: 1 EQ	UIPMENT VOI	= PUMP VOLU		BING CAPACI		JBING LENGTH			= 0.2\gallons
	UMP OR TUBIN I WELL (feet):	^G 21		MP OR TUBING WELL (feet):	21	DURCIN		DURCING	11:00	TOTAL VOI	
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP (°C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) Or % saturation	TURBIDI' (NTUs)		
11:08	0.25	0.25	0.08	5.80	5.21	28.33	6873	0.79	25.	7 clea	r 35.5
				-					_		
									-		_
WELLCA	PACITY (Gallon	s Per Foot):	0 75" = 0.02	1" = 0.04; 1	.25" = 0.0	6; 2" = 0.10	6: 3'' = 0.37;	4" = 0.65;	5" = 1.02;	6 " = 1.47;	12" = 5.88
TUBING !!	NSIDE DIA. CA	PACITY (Gal./	Ft.): 1/8" = 0	.0006; 3/16" =	0.0014;	1/4" = 0.002	6; 5/16'' = 0,	004; 3/8" =	0.006; 1/2	" = 0.010;	5/8'' = 0.016
PURGING	EQUIPMENT	ODES: E	I = Bailer;	BP = Bladder Pu		LING DA	Submersible Pur	mp; PP =1	Peristaltic Pun	np; 0 = 0	ther (Specify)
	BY (PRINT) / A		Geosynhe	SAMPLER(S) S				SAMPLING	AT: 11:15	SAMPLIN	
PUMP OR	TUBING	21		TUBING	0			-FILTERED:		FILTER S	IZE:μm
	WELL (feet): CONTAMINATIO		IP Y A	MATERIAL COL		Y NTTE	Filtratio	DUPLICATE			
						RESERVATIO		INTEND	- r	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIV	E 1	TOTAL VOL	FINAL	ANALYSIS	AND/OR E	CODE	FLOW RATE (mL per minute)
Exanin-	1 /	PE	250 m	HNO3			-	Ca, Fe,	Mg, Mh	APP	<100
- 13	1	PE	250 ml	NONE			-	CL, SOY	NUZ, NO	APP	c100
-11	3	AG	40 m	H2SO4		50m	-	TO	00	APP	c 100
11	3	CG	Yoml	HCI		-	-	VC	۶Hs (APP	6100
REMARKS	Wells I	historical	ily pung	e dry. c)ne e	gu i p me	4 volum	e prye	el befor	re sampl	'~g.
MATERIA	CODES	AG = Amber	Glass; CG :	= Clear Glass;	PE = Poly	ethylene;	PP = Polypropyl	ene; S = Silio	cone; T = T	eflon; O = C	Other (Specify)
SAMPLING	G EQUIPMENT		APP = After Pe	eristaltic Pump; se Flow Peristaltic	B = Bai	ler; BP =	Bladder Pump; Method (Tubing	ESP = Elec	tric Submersil		
DTES: 1	The above (do not cons	titute all of	the informatio	n require	d by Chante	er 62-160 F A	C.			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS	JAX E	K TAP		SI LC	TE CATION:	Jacks	onville,	FL		
WELL NO		uw -12		SAMPLE ID:	5	EKMW -	12		DATE:	7/11/20	219
				F		SING DA		1			
WELL VO	R (inches): 2 2000 CLUME PURGE ut if applicable)	Dir avita	TER (inches):		/9 fe - STA		STATIC D TO WATE O WATER) X feet) X	R (feet): 5	. 99 _{OF}	JRGE PUMP T R BAILER:	PP
(only fill o	ut if applicable)			. = PUMP VOLUME	: + (TUB		γ χ τι	JBING LENGTH	I) + FLOW C	ELL VOLUME	= 0 · 21 gallons
INITIAL P DEPTH IN	UMP OR TUBIN WELL (feet):	^G 21		IP OR TUBING WELL (feet):	21	PURGIN		2 PURGING ENDED AT		TOTAL MO	
TIME	VOLUME PURGED (gailons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)		pH andard inits)	TEMP (^o C)	COND. (circle units) μmhos/cm or	DISSOLVED OXYGEN (circle units) Or % saturation	TURBID (NTUs		R ORP
11:50	0.25	0.25	0.06	6.15 5	72	29.87	2971	0.32	10.4	t cles	- 40.8
TUBING I		PACITY (Gal /	Ft.): 1/8" = 0.0	1" = 0.04; 1.25 0006; 3/16" = 0.1 3P = Bladder Pump	0014;	1/4" = 0.0026		004; 3/8'' =	5 " = 1.02; 0.006; 1/2 Peristaltic Pur	2 " = 0.010;	12 " = 5.88 5/8 " = 0.016 ther (Specify)
						LING DA	TA				
	BY (PRINT) / A		osurke	SAMPLER(S) SIGI	VATURE	E(S):		SAMPLING INITIATED A	T: 12:0	SAMPLIN ENDED A	IG AT: 12:20
PUMP OR		21	/	TUBING MATERIAL CODE:	1	PE, S		FILTERED: Y		FILTER S	IZE:μm
FIELD DE	CONTAMINATIO	ON: PUM	IP Y) TL	BING	Y De	placed)	DUPLICATE		N	
	PLE CONTAINE #	MATERIAL		SAN PRESERVATIVE		ESERVATION	I FINAL	INTEND ANALYSIS A METHO	AND/OR E	SAMPLING EQUIPMENT	SAMPLE PUMP FLOW RATE
ID CODE	CONTAINERS	CODE PE	250 14	USED HNDz	ADDE	D IN FIELD (m	1L) pH			CODE	(mL per minute)
n	1	PE	250 14	NONE				Ca, Fe, K	J. 1	1.00	6100
n	3	AG	YONL	H2SO4				CI, 504,		APP	c/00
n	3	CG	40 m	मल		-	-	VOF	ls	APP	c100
REMARKS MATERIA SAMPLING	Dup -	AG = Amber (CODES: A	Glass; CG =	Clear Glass; PI	E = Poly B = Bail	ethylene; I er; BP = f	PP = Polypropyle Bladder Pump; Vethod (Tubing	ene; S = Silic ESP = Elect	one; T = T tric Submersi	eflon; O = (J · Dther (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS	JAX	EK TP	rP.	SITE LOC	ATION:	Jack	sonville	PL		
WELL NO	Ek	cmw-1	3B	SAMPLE ID:	e	EKMW	- 13B		DATE: -	111/20	19
			-		PURGI	NG DA	ΓΑ				
	(,		TER (inches):			to 23 fe	et TO WATE	ER (feet): 4.1	2 OR	rge pump t Bailer:	YPE PP
(only fill ou	ut if applicable)		= (feel	t –	_	feet) X		gallons/fo		gallons
	it if applicable)	UNGE. TEQ					ns/foot X 3 C	,			= 0.2 gallons
	JMP OR TUBIN WELL (feet):	^{IG} 21		/P OR TUBING WELL (feet):	21	DURCING		DURCINC		TOTAL VO PURGED (LUME
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)		pH andard units)	TEMP. (°C)	COND (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) or % saturation	TURBIDI (NTUs)		
12:44	0.25	0.25	0.06	7.10 5	.86	29.48	3253	0.20	8.3	1 des	62.8
			_								
			_								
	PACITY (Gallor			1" = 0.04; 1.2 0006: 3/16" = 0		2'' = 0.16 / 4'' = 0.0026			5" = 1.02; 006: 1/2	6 " = 1.47 " = 0.010;	12 " = 5.88 5/8 " = 0.016
				BP = Bladder Pump			Submersible Pu		eristaltic Pun		ther (Specify)
						ING DA	TA	1			
Byc	BY (PRINT) / A		severystee	SAMPLER(S) SIG	NATURE(S	m	~	SAMPLING INITIATED AT		()	
PUMP OR DEPTH IN	TUBING VELL (feet):	21		TUBING / MATERIAL CODE	: <i>0</i>	PE, S		-FILTERED: Y on Equipment Ty	pe:	FILTER S	ilZE:μm
FIELD DEG	CONTAMINATIO	DN: PUN	IP Y K	דו דו	JBING	Y Der	placed)	DUPLICATE:	Y	Ð	
SAMPLE		MATERIAL		PRESERVATIVE	TO	SERVATION	FINAL	INTENDE ANALYSIS AN METHO	ND/OR E	Sampling Quipment Code	SAMPLE PUMP FLOW RATE (mL per minute)
ID CODE	CONTAINERS	CODE	250nl	USED HNO3	ADDED	IN FIELD (m	IL) pH	Ca, Fe, M		APP	< 100
0	1	PE	250 nL	NONE		-	-	CI, SOY, N	•	APP	2100
11	3	AG	40 ml	H2SD4		-	-	TOC	<i>.</i> , .	APP	L100
11	3	50	40 m	HCI				VOH	s	APP	6100
REMARKS	Wells H	uistoricall	y purge	dy. On	e egy	ipment	volume	puged be	-Gore s	onpling	
MATERIAL	CODES	AG = Amber	Glass: CG =	Clear Glass; P	E = Polyeth			lene; S = Silico			Other (Specify)
	EQUIPMENT	CODES: A	PP = After Pe		B = Bailer;	BP = E	Bladder Pump;	ESP = Electri Gravity Drain);	ic Submersil		(opeony)
OTES: 1.	The above			he information i							

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

	VI NI	AS JAX	EK T	AP	SI LO	CATION:	Jack	sonville,	FL		
WELL NO	EK	MW - 14		SAMPLE ID:		EKMW	-14		DATE:	7/11/19	1
					PURG	ING DA	TA				
	re (monoo).		TER (inches):	'/ 4 DEPTH:	19 fe	NTERVAL et to 23 fe	STATIC D	R (feet): 2 -	35	PURGE PUMP T OR BAILER:	YPE P
	ut if applicable)	1 WELL VO	LUME = (IUI) = (AL WELL DEPTH			feet) X			s/foot =	gallons
	NT VOLUME P ut if applicable)	URGE: 1 EQU		. = PUMP VOLUM		ING CAPACI		JBING LENGT	H) + FLOW	CELL VOLUME	
			r		s+(0 ,	0026 gallo			t)+ O.	132 gallons	= 0.21 gallons
	UMP OR TUBIN I WELL (feet):	^{IG} 21		IP OR TUBING WELL (feet):	21	PURGIN	G ED AT: 13:3		13:	34 TOTAL VO PURGED (LUME gallons): 0.25
TIME	VOLUME PURGED (gallons)	CUMUL, VOLUME PURGED (gallons)	PURGE RATE (gpm)		pH andard units)	TEMP. (^o C)	COND. (circle units) µmhos/cm or nS/om	DISSOLVED OXYGEN (circle units) or % saturation	TURE	BIDITY COLC Us) (descrii	
13:34	0.25	0.25	0.06	4.58 8	3.38	30.76	1415	1-16	н	GH brow	n -3.7
									_		
	_										
				1" = 0.04; 1.2 0006; 3/16" = 0						2; 6" = 1.47; 1/2" = 0.010;	12 " = 5.88 5/8 " = 0.016
PURGING	EQUIPMENT	ODES: B	= Bailer; E	3P = Bladder Pum	·		Submersible Pur	mp; PP = F	Peristaltic	Pump; 0 = 0	ther (Specify)
SAMDLED	BY (PRINT) / A			SAMPLER(S) SIG			TA	" <u> </u>			
	e Zinck					3m	1	SAMPLING	AT: 13:	40 SAMPLIN ENDED A	IG AT: 13:50
PUMP OR	TUBING WELL (feet)	21	'	TUBING	PF	S		FILTERED: Non Equipment T		FILTER S	SIZE: μm
					JBING		placed)	DUPLICATE		Ð	
	PLE CONTAINE				_	ESERVATIO	1120200339	INTEND		SAMPLING	SAMPLE PUMP
	# CONTAINERS			PRESERVATIVE	Т		FINAL		AND/OR	EQUIPMENT	FLOW RATE (mL per minute)
EKMW-		PE	250 NL	HN03		_	-	Ca, Fe, A	re. Mr	APP	£/00
ĸ	I.	PE	250 -L	NONE		-	-	C1, 504			c100
n	3		20 40 -L	H2504		-	-	TO		APP	c100
и	3	CG	YOLL	HCI		_	-	VO		APP	e 100
" M	5 3	CG	40 ml	HCI			-	VO		APP	6 100
" M		CG	40 -4	HCI		-	-		Hs	APP	c100
REMARKS	Wells Collect	historico	thy purg	e dry. Or pike (MS)		d not			befor	e somplin	
MATERIAL		AG = Amber (E = Polye		PP = Polypropyl				Other (Specify)
SAMPLING	GEQUIPMENT		PP = After Per FPP = Reverse	ristaltic Pump; e Flow Peristaltic F	B = Bail ump;	er; BP =	Bladder Pump; Method (Tubing	ESP = Elec		ersible Pump;)ther (Specify)	
OTES: 1	The above (do not const	itute all of th	he information	required	hy Chante	er 62-160 F A	C			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

OUTE											
SITE NAME:	NAS JAX EK	K TAP				TE DCATION: `	Jacksonville, FL				
WELL NO): EKMW-11			SAMPLE	D: EKM	N-11			DATE:	0/22/1	ዓ
					PURC	SING DA	TA				•
WELL					LL SCREEN		STATIC	DEPTH		IRGE PUMP T	YPE 30
	R (inches):		METER (inches		PTH: 19 fe	et to 23 f	COWATER) X	ER (feet): 4		R BAILER:	PP
(only fill o	ut if applicable)		= (200 (24 (24 (24 (24 (24 (24 (24 (24 (24 (24		energen ser	
EQUIPME		PURGE: 1 E		DL. = PUMP VOI	feet – .UME + (TUE	SING CAPACI	feet) X TY X T	UBING LENGTH	gallons/fo) + FLOW C		gallons
(only fill o	ut if applicable)			= O g	allons + (D ,	0026 gallo	ons/foot X	30 feet)	+ 0 - 13	2_ gallons	= 0.2 gallons
	UMP OR TUBI	NG 21		JMP OR TUBIN		PURGIN	G	PURGING	10:07	TOTAL VO	LUME
DEPTHIC	WELL (feet):	1		N WELL (feet):	21		ED AT: 10:0	DISSOLVED	10.01	PURGED (gallons): 0.25
TIME	VOLUME PURGED	CUMUL VOLUM PURGEI	E PURGE	E DEPTH TO WATER	pH (standard	TEMP. (°C)	COND. (circle units) µmhos/cm	OXYGEN (circle units)	TURBIDI (NTUs		
	(gallons)	(gallons) (gpm)	(feet)	units)		or Son	% saturation		, (
10:07	0.25	0.25	0.04	1 6.85	5.70	28.70	6320	0.65	19.9	ciea	r 53.2
				_		_					
			_								
_											
										_	
	PACITY (Gallor				1.25" = 0.06		6; 3 " = 0.37;	4" = 0.65;	5" = 1.02;	6 " = 1_47;	12" = 5.88
	EQUIPMENT		L/Ft.): 1/8" = (B = Bailer:	BP = Bladder F		1/4" = 0.002				(20.11)	5/8" = 0.016
1 Ontointo		JODE3.	D - Daller,	DF - Diaudei r	Sussession and the second s	LING DA	Submersible Pu	mp; PP = Pe	eristaltic Pur	np; U ≃O	ther (Specify)
-	BY (PRINT) /		-	SAMPLER(S)				SAMPLING		SAMPLIN	IG
	- Zinch	graf /	Geosynt		n	3 cy		INITIATED AT		ENDED A	T: 10:20
PUMP [®] OR DEPTH IN	TUBING WELL (feet):	2	น ่	TUBING MATERIAL CO	DDE: PE	0		-FILTERED: Y on Equipment Typ		FILTER S	IZE:μm
FIELD DE	CONTAMINATI	ON: PU	MP Y	9	TUBING	Y ATTre	placed)	DUPLICATE:	Y	Ø	
SAM	PLE CONTAINE	ER SPECIFIC	CATION		SAMPLE PR	ESERVATIO	N	INTENDE	D	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATI		OTAL VOL D IN FIELD (n	nL) pH	ANALYSIS AN METHOI		CODE	FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA	1.500			S2O8 (Persu	ulfate)	APP	300
EKMW-11	3	AG	40 mL	H2S04			-	тос		APP	< 100
EKMW-11	1	PE	250 mL	NONE			-	SO42-		APP	300
EKMW-11	1	PE	250 mL	HNO3		-		Sulfur, To	otal	APP	300
EKMW-11	1	PE	250 mL	HNO3		-	-	Fe, Mn		APP	300
DEMADUCO						nolina no	20 -0	C O ·	12 -	4.8	
REMARKS	a con matoriae	ally purges dr ulfate tested	y. Purge one e in field with CH	quipment volum EMETS colorim	e prior to sam etric tubes.		9520°	5208:	80 m	dite	
REMARKS	Sodium pers	ally purges dr ulfate tested AG = Amber	in field with CH	euipment volum EMETS colorim = Clear Glass;	e prior to sam etric tubes, PE = Polye		PP = Polypropyl		(2:1	dilyhon) Other (Specify)
MATERIAL	Sodium pers	AG = Amber CODES:	in field with CH r Glass; CG APP = After Pe	EMETS colorim	etric tubes. PE = Polye B = Baile	ethylene; I		ene; S = Silico ESP = Electri	(2:1 ne; T = To c Submersil	dilyhon eflon; O=C	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EM	(TAP					Jacksonville, FL				
WELL NO	EKMW-12			SAME	LEID: EKM				DATE:	10/22	.1 19
					PUR	GING DA	ТА			1.100	1.1.1
WELL DIAMETEI	R (inches):	2 TUBI	NG IETER (inches)		VELL SCREEN		STATIC	DEPTH ER (feet): 4	A 7	PURGE PUMP T OR BAILER:	TYPE PP
WELL VO		1 WELL V			EPTH - STA	TIC DEPTH	O WATER) X	WELL CAPAC	HTY YTE	ON BAILEN.	ΥŢ
			= (feet -		feet) X			s/foot =	gallons
(only fill ou	t if applicable)	PURGE: 1 E	QUIPMENT VO		OLUME + (TUE				i) + Flow	CELL VOLUME	
	JMP OR TUBI			= O	gallons + (0.				t) + 0.1		= 0.2/gallons
	WELL (feet):	19 21		WELL (feet		PURGIN	ED AT: /0 :4		10:4	17 TOTAL VO PURGED (gailons): 0,25
TIME	VOLUME PURGED (gallons)	CUMUL VOLUMI PURGEI (gallons)	E PURGE RATE	DEPTH TO WATER (feet)	pH (standard	TEMP. (°C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) @go or % saturation	TURB (NT		
10:47	0.25	0.25	0.04	6.75	5.41	29.40	2787	0.51	17.	9 clea	-12.5
			_		_						
				-							
				_							
			_	_							
					-						
				-							
					-						
			-								
			0.75" = 0.02; ./Ft.): 1/8" = 0		1.25" = 0.00 6" = 0.0014;	6; 2" = 0.1	6; 3 " = 0,37; 6; 5/16" = 0.	CONTRACT SAMPLEY	5" = 1.02		12" = 5.88
	EQUIPMENT		B = Bailer;	BP = Bladde			Submersible Pu		Peristaltic F	1/2" = 0.010; ² ump: 0 = 0	5/8" = 0.016
					SAMP	LING DA					(
_	BY (PRINT) / A			SAMPLER	S) SIGNATURE	E(S):		SAMPLING INITIATED A	- 10:5	SAMPLIN	
PUMPOR	Zinckgr TUBING			TUBING	- ge	P	FIELD	-FILTERED: Y			AI: μm
	WELL (feet):		21	TUBING	CODE:	PE	Filtrati	on Equipment Ty			μπ
	ONTAMINATI	_			TUBING		placed)	DUPLICATE	: Y	Ø	È
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERV	TIVE 1	ESERVATIO OTAL VOL D IN FIELD (r	FINAL	INTEND ANALYSIS A METHO	ND/OR	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-12	1	CHEMETS	25 mL	NA				S2O8 (Pers	sulfate)	APP	300
EKMW-12	3	AG	40 mL	H2S04		_	-	тос		APP	6/00
EKMW-12	1	PE	250 mL	NONE		-	-	SO42-		APP	3.00
EKMW-12	1	PE	250 mL	HNO3		-	-	Sulfur, T	otal	APP	300
EKMW-12	1	PE	250 mL	HNO3			-	Fe, Mn		APP	300
REMARKS:	a con matorice	ally purges dr ulfate tested	y. Purge one eq in field with CH	uipment volu EMETS color	ime prior to san	npling.	5208	:~0.25	سع/د	-	
MATERIAL	CODES:	AG = Amber	Glass; CG =	- Clear Glass	; PE = Poly	ethylene;	PP = Polypropyl	ene; S = Silico	one; T=	Teflon; O = 0	Other (Specify)
SAMPLING	EQUIPMENT		APP = After Pe RFPP = Revers		p; B = Bail	er; BP =	Bladder Pump; Method (Tubing	ESP = Elect	ric Subme		· · · · · · · · · · · · · · · · · · ·
TES: 1.	The above of					d by Chapte	er 62-160, F.A	.C.		(-,,))	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

MELL NO.	_	ТАР			SI LC	CATION:	lacksonville, FL				
WELL NO.	EKMW-13B			SAMPLE	ID: EKMV	V-13B			DATE: 10	22/2	019
					PURG	SING DA	TA				
WELL DIAMETER	(inches): 2	DIAME	G TER (inches):		L SCREEN I	INTERVAL et to 23 fe	STATIC D			SE PUMP TY AILER:	^{(PE} ጉ P
WELL VOL	UME PURGE	1 WELL VO					OWATER) X	WELL CAPAC	ITY	Wither V.	
			= (feet -		feet) X		gallons/foot	a .	gallor
(only fill out	IT VOLUME P if applicable)	URGE: 1 EQU	JIPMENT VOL.					UBING LENGTH) + FLOW CELI	VOLUME	
						0026 gallo)+ 0.132		
	MP OR TUBIN NELL (feet)	21	DEPTH IN V	P OR TUBING VELL (feet):	21	PURGIN	G AT: 11:15	S PURGING ENDED AT:	11:22	TOTAL VOL PURGED (g	ume allons): O .
TIME	VOLUME PURGED	CUMUL. VOLUME PURGED	PURGE RATE	DEPTH TO WATER	pH (standard	TEMP. (°C)	COND. (circle units) µmhos/cm	DISSOLVED OXYGEN (circle_units)	TURBIDITY (NTUs)	COLOF (describ	
	(gallons)	(gallons)	(gpm)	(feet)	units)		or water	% saturation			-, (,
11:22	0.25	0.25	0.04	6.50	5.47	29.68	2872	1.08	7.16	clea	17.
											_
											_
											_
											_
											_
			-								
NELL CAP	ACITY (Gallon	s Per Foot): ().75" = 0.02; Ft.) 1/8" = 0.00			; 2" = 0.16 1/4" = 0.0026					12" = 5.88 5/8" = 0.016
				P = Bladder P		11 0.002		004, 010 - 0			
PURGING E	QUIPMENT C	ODES: B	= Bailer; Bl	F = Blauder F	ump; EX	SP = Electric	Submersible Put	mp; PP = P	eristaltic Pump;	O = Ot	her (Specify)
					SAMPI	LING DA		mp; PP = P	eristaltic Pump;	O = Ot	her (Specify)
SAMPLED E	BY (PRINT) / A	FFILIATION:	s	SAMPLER(S)	SAMPI	LING DA		SAMPLING	eristaltic Pump; T: 11:25		
SAMPLED E BUC	BY (PRINT) / A Zincky UBING	FFILIATION:	syntec 1	SAMPLER(S)				SAMPLING INITIATED A	t: ; 25	SAMPLING ENDED A	° ∏:45
BAMPLED E BALLE PUMPOR T DEPTH IN V	BY (PRINT) / A Zincky UBING	FFILIATION: of / Geo 21	rsyntec	BAMPLER(S)		LING DA	FIELD- Filtratio	SAMPLING INITIATED A FILTERED: Y on Equipment Ty	т. II : 25	SAMPLING ENDED A FILTER SI	° ∏:45
SAMPLED E BUT PUMPOR T DEPTH IN V FIELD DECO	BY (PRINT) / A Zincky UBING UBING VELL (feet): DNTAMINATIO	FFILIATION: of / Geo 21	syntec P Y O			LING DA	FIELD- Filtratic	SAMPLING INITIATED A FILTERED: Y on Equipment Ty DUPLICATE:	T: 11; 25 pe:⊘ ⊘	SAMPLING ENDED A FILTER SI	G Τ: //:4 5 ZE:μm
SAMPLED E BAJCE PUMPFOR T DEPTH IN V FIELD DECC SAMPLE	BY (PRINT) / A Zincky UBING UBING VELL (feet): DNTAMINATIO	FFILIATION: DN: PUM	PY N TION		SAMPI SIGNATURE DDE: TUBING SAMPLE PR		FIELD- Filtratic placed)	SAMPLING INITIATED A FILTERED: Y on Equipment Ty	T: 11:25	SAMPLING ENDED A FILTER SI	G //: 4 S T: //: 4 S ZE:μm SAMPLE PUN FLOW RATE
SAMPLED E BUILT DEPTH IN V FIELD DECC SAMPLE D CODE	BY (PRINT) / A Zinckay UBING VELL (feet): DNTAMINATIC E CONTAINERS 1	FFILIATION: Concept Concept Concept Concept Concept Concept	rsynkec P Y O TION	CUBING MATERIAL CO PRESERVATIV	SAMPI SIGNATURE DDE: TUBING SAMPLE PR		FIELD- Filtratic placed)	SAMPLING INITIATED A FILTERED: Y on Equipment Ty DUPLICATE: INTEND ANALYSIS A	T: II : 25 pe: C ED ND/OR ID SAI EQL C	SAMPLING ENDED A' FILTER SI N MPLING JIPMENT	
SAMPLED E PUMPOR T DEPTH IN V FIELD DECC SAMPLE D CODE KMW-138 KMW-138	BY (PRINT) / A Zinckay UBING VELL (feet): DNTAMINATIC LE CONTAINERS 1 3	FFILIATION: Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conception Conce	PY VOLUME 25 mL 40 mL	UBING UBING MATERIAL CO PRESERVATIV USED	SAMPI SIGNATURE DDE: TUBING SAMPLE PR		FIELD- Filtratic placed) N FINAL pH	SAMPLING INITIATED A FILTERED: Y DUPLICATE: UDUPLICATE: INTENDI ANALYSIS A METHO	T: II: 25 pe: D D D D D D D D D D D D D	SAMPLING ENDED A FILTER SI N MPLING JIPMENT CODE	G T: //: 4 S ZE: µm SAMPLE PUN FLOW RATE (mL per minut
SAMPLED E DEPTH IN V FIELD DECC SAMPLE D CODE KMW-138 KMW-138	BY (PRINT) / A UBING VELL (feet): DNTAMINATIO LE CONTAINERS 1 3 1	FFILIATION: CAR / Geo 21 DN: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE	Y Y P Y Y TION Y Y VOLUME F 25 mL 40 mL 250 mL 1	UBING UBING WATERIAL CO PRESERVATIN USED NA	SAMPI SIGNATURE DDE: TUBING SAMPLE PR		FIELD- Filtratic placed) N FINAL pH	SAMPLING INITIATED A FILTERED: Y on Equipment Ty DUPLICATE: INTEND ANALYSIS A METHO S208 (Pers	T: 11:25 pe: ED ND/OR ND/OR U ulfate)	SAMPLING ENDED A FILTER SI N MPLING JIPMENT CODE APP	G //: 4/5 ZE:μm SAMPLE PUN FLOW RATE (mL per minut 300 4/00 300
SAMPLED E BUMPOR T DEPTH IN V FIELD DECC SAMPLE D CODE KMW-13B KMW-13B KMW-13B	BY (PRINT) / A Zinckar UBING V VELL (feet): DNTAMINATIC E CONTAINERS 1 3 1 1 1	FFILIATION: CON: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE PE	Y Y P Y Y TION VOLUME F 25 mL 40 mL 250 mL 250 mL 250 mL 2	VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VUBING VU	SAMPI SIGNATURE DDE: TUBING SAMPLE PR		FIELD- Filtratic placed) N FINAL pH	SAMPLING INITIATED A FILTERED: Y DUPLICATE: INTENDI ANALYSIS A METHO S2OB (Pers TOC	T: 11:25 pe: D D D D D D D D D D D D D	SAMPLING ENDED A' FILTER SI N MPLING JIPMENT CODE APP APP APP APP	G T: 11: 4 S ZE:μm SAMPLE PUN FLOW RATE (mL per minut 300 4/00 300 300 300
SAMPLED E BUMPOR T DEPTH IN V FIELD DECC SAMPLE D CODE KMW-13B KMW-13B KMW-13B	BY (PRINT) / A UBING VELL (feet): DNTAMINATIO LE CONTAINERS 1 3 1	FFILIATION: CAR / Geo 21 DN: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE	Y Y P Y Y TION Y Y VOLUME F 25 mL 40 mL 250 mL 1	AMPLER(S) UBING ATERIAL CO PRESERVATIV USED NA H2S04 NONE	SAMPI SIGNATURE DDE: TUBING SAMPLE PR		FIELD- Filtratic placed) N FINAL pH	SAMPLING INITIATED A FILTERED: Y DUPLICATE: INTENDI ANALYSIS A METHO S2OB (Pers TOC SO4 ²⁻	T: 11:25 pe: D D D D D D D D D D D D D	SAMPLING ENDED A' FILTER SI. N MPLING JIPMENT CODE APP APP APP	G T: 11:45 ZE:μm SAMPLE PUN FLOW RATE (mL per minut 300 4100 300
SAMPLED E BAJCL PUMPIOR T DEPTH IN V FIELD DECC SAMPLE	BY (PRINT) / A Zinckay UBING VELL (feet): DNTAMINATIONE E CONTAINERS 1 3 1 1 1 1 Well historicz	FFILIATION: CALCON: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE PE	Y Y P Y Y TION VOLUME F 25 mL 40 mL 250 mL 250 mL 250 mL 2	VUBING VUBING VATERIAL CC PRESERVATIN USED NA H2S04 NONE HNO3 HNO3 pment volume	SAMPI SIGNATURE DDE: TUBING SAMPLE PR VE TI ADDEI		FIELD Filtratic placed) N FINAL pH 	SAMPLING INITIATED A FILTERED: Y DUPLICATE: UNTEND ANALYSIS A METHO S2OB (Pers TOC SO4 ²⁻ Sulfur, TI Fe, Mn	T: 11:25	SAMPLING ENDED A' FILTER SI N MPLING JIPMENT CODE APP APP APP APP	G T: 11: 4 S ZE:μm SAMPLE PUN FLOW RATE (mL per minut 300 4/00 300 300 300
SAMPLED E PUMPIOR T DEPTH IN V FIELD DECC SAMPIE D CODE CMW-138 CMW-138 CMW-138 CMW-138 CMW-138	BY (PRINT) / A Zinckay UBING VELL (feet): DNTAMINATIO E CONTAINERS 1 3 1 1 1 1 Well historica Sodium person	FFILIATION: CALCON: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE PE	P Y N TION VOLUME F 25 mL 40 mL 250 mL 250 mL 250 mL 250 mL 250 mL 250 mL 250 mL	VUBING VUBING VATERIAL CC PRESERVATIN USED NA H2S04 NONE HNO3 HNO3 pment volume	SAMPI SIGNATURE DDE: TUBING SAMPLE PR VE TI ADDEI	LING DA	TA FIELD- Filtratio placed) N FINAL pH 	SAMPLING INITIATED A FILTERED: Y DI Equipment Ty DUPLICATE: INTENDI ANALYSIS A METHO S2OB (Pers TOC S04 ²⁻ Sulfur, Tr Fe, Mn	T: 11:25	SAMPLING ENDED A' FILTER SI N MPLING JIPMENT CODE APP APP APP APP	G T: 11: 4 S ZE:μm SAMPLE PUN FLOW RATE (mL per minut 300 4/00 300 300 300

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS	JAX E	K TAP			SITE .OCATION:	Jacks	onville,	FL		
WELL NO:	EK	MW - 1	Ч	SAMPLE	ID: 6	ERMW-1	4	100	DATE:	10/22/2	2019
					PUR	GING DA	ТА				
WELL DIAMETER			ETER (inches):	'/식 DEP	TH: 19 1	NINTERVAL	STATIC D eet TO WATE O WATER) X	R (feet): 15.	53 0	JRGE PUMP ⁻ R BAILER:	TYPE PP
(only fill out i	f applicable)	. I WELL V						WELL CAPAC		-	
EQUIPMEN (only fill out i		URGE: 1 EC	= (QUIPMENT VOL	. = PUMP VOL	,			JBING LENGTH	•	ELL VOLUME	
INITIAL PUN DEPTH IN V	IP OR TUBI VELL (feet):	^{1G} 19		= O ga //P OR TUBING WELL (feet):		PURGING INITIATE	<u>v</u>	DUDONIO			= 0 , 2 /gallons DLUME (gallons): 0 , 2 5
ТІМЕ	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP	COND. (circle units) μmhos/cm or	DISSOLVED OXYGEN (circle units) or % saturation	TURBID (NTUs		
15:25	0.25	0.25	0.03	17.06	7.17	29.70	1339	1.72	28.	معل ٦	30.1
TUBING INS	IDE DIA. CA	PACITY (Gal.	./Ft.): 1/8" = 0.	0006; 3/16''	= 0.0014;))))))))))))))	5; 5/16" = 0.0	004; 3/8" = 0	0.006; 1/	6 ¹⁰ = 1.47; 2 ¹¹ = 0.010;	12 " = 5.88 5/8 " = 0.016
URGING E	QUIPMENT	ODES: I	B = Bailer;	BP = Bladder P			Submersible Pur	np; PP = P	eristaltic Pur	mp; O = 0	Other (Specify)
_	Y (PRINT) / /		Omplec	SAMPLER(S)				SAMPLING INITIATED A	T: 15:3	SAMPLI	NG AT: 15:40
PUMP OR TU	JBING U		9	TUBING MATERIAL CO		7		FILTERED: Y	A716	OGILTER S	SIZE: µm
	NTAMINATI				TUBING		Diaced)	DUPLICATE:	hanne	Ø	_
SAMPL		ER SPECIFIC			SAMPLE P	RESERVATION		INTEND	Ť	SAMPLING	SAMPLE PUMP
	# ONTAINERS	MATERIAL CODE	VOLUME	PRESERVATINUSED		TOTAL VOL ED IN FIELD (m	FINAL L) pH	ANALYSIS A METHC	ND/OR E	CODE	FLOW RATE (mL per minute)
KANW-14		CHMETS	2.5 mi	NA		_		5209 (pers 1 lok	APP	~ 300
_	3	AG	40 mi	H2SO4		_		TOC			6/00
		PE	250 ml	NONE		-	-	Sou	2-		~ 300
	<u> </u>	PE	250 m	HNDS		~	-	Sulfur,			~ 300
		PE	250 ml	HNOS			-	Fe, IL	n	¥	~ 300
REMARKS: A	Shop g	AG = Ambe	ما مالویت Glass; CG = APP = After Per RFPP = Revers	Clear Glass;	PE = Pol	yethylene; ¹ P iler; BP = B	P = Polypropyle Bladder Pump; Method (Tubing (ene; S = Silico ESP = Electi	sunce of one; T = T ric Submersi	eflon; O=	Cther (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units **Temperature**: \pm 0.2 °C **Specific Conductance**: \pm 5% **Dissolved Oxygen**: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity**: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE CATION:	acksonville, FL				
WELL NO	EKMW-11			SAMPLE	ID: EKMV	V-11			DATE:	115/19	
ι					PURG	SING DA	ТА			با عرب ا	
WELL DIAMETE			ETER (inches):	UH DEP		et to 23 f		DEPTH ER (feet): 4,2 WELL CAPAC		RGE PUMP T' BAILER:	PP
	t if applicable)	I WELL VO	= (feet-		feet) X		gallons/fo	ot = -	gallons
	NT VOLUME P t if applicable)	URGE: 1 EQ		= PUMP VOL	UME + (TUB	ing capaci ملاحی	TY X TI	UBING LENGTH) + FLOW CI	ELL VOLUME	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	JMP OR TUBIN WELL (feet):	ان م		IP OR TUBING		PURCIN		PURCING		TOTAL VOI	
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units)	TURBIDI (NTUs)		
957	0.75	0.35	. 0.05	6.93	5.42	25.83	8740	0,60	13,4	I Clec	W 11.9
_			_								
			_						+		
-			-	-					-		
			_								
									1		
	ACITY (Gallon								5 " = 1.02;		12" = 5.88
	EQUIPMENT C			0006; 3/16" BP = Bladder P			6; 5/16" = 0. Submersible Pu		eristaltic Pur	2'' = 0.010;	5/8" = 0.016 ther (Specify)
T BILOING			s – Ballor,			LING DA		, 11 - 1			
	BY (PRINT) / A			SAMPLER(S)			<u> </u>	SAMPLING INITIATED A	т: 1600		
PUMP OR	TUBING I	Susiy	nec	TUBING	Tor	- 0		-FILTERED: Y	N		ilZE:μm
	WELL (feet):			MATERIAL CO		2,9		on Equipment Ty	/pe:	A	
			ĭ			0	eplaced)	DUPLICATE			SAMPLE PUMP
SAMPLE ID CODE	PLE CONTAINE # CONTAINERS	MATERIAL	VOLUME	PRESERVATI USED	VE T	RESERVATIO IOTAL VOL ID IN FIELD (FINAL	INTEND ANALYSIS A METHO	ND/OR E	SAMPLING EQUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA		NA	NA	S2O8 (Pers	sulfate)	APP	~100
EKMW-11	3	AG	40 mL	H2S04		1	42	тос		APP	1
EKMW-11	1	PE	250 mL	NONE			NA	SO42-		APP	
EKMW-11	1	PE	250 mL	HNO3		_	42	Sulfur, T	otal	APP	
EKMW-11	1	PE	250 mL	HNO3		4	22	Fe, Mn		APP	4
REMARKS	won matorice			uipment volum EMETS colorim		πpling.	S208 =	0.7 mg	L		
MATERIAL	CODES:	AG = Amber	Glass; CG =	Clear Glass;	PE = Poly			lene; S = Silico		efion; O = 0	Other (Specify)
	EQUIPMENT			e Flow Peristal		SM = Straw	Bladder Pump; Method (Tubing er 62-160, F.4			ible Pump; er (Specify)	63

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units **Temperature:** \pm 0.2 °C **Specific Conductance:** \pm 5% **Dissolved Oxygen:** all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity:** all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

WELL NO: EKMW-12 SAMPLE (D: EKMM-12 DATE Image: Constraint of the state of the	SITE NAME:	NAS JAX EK	ТАР				TE DCATION:	acksonville, FL					
WELL DUMMETER (non-bay: (month) TUBINO DUMMETER (non-bay: (month) TUBINO (month) Events 23 cml DEPTH in yet cets 23 cml DE	WELL NO	EKMW-12			SAMPLE IC	: EKMV	V-12			DATE: 1	115/19		
DIAMETER (inches): Image: Construction of the standard standar						PURC	SING DA	ТА			4-11-1		
Intel Test Test <t< td=""><td>DIAMETE</td><td>r (monos).</td><td>DIAME</td><td>ETER (inches):</td><td></td><td>H: 19 fe</td><td>et to 23 f</td><td>eet TO WATE</td><td>ER (feet): 57</td><td>KU OR</td><td></td><td></td></t<>	DIAMETE	r (monos).	DIAME	ETER (inches):		H: 19 fe	et to 23 f	eet TO WATE	ER (feet): 57	KU OR			
EQUIPMEENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME - (TUBING CARACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) = 0 galons + (0, UOW galons to X) FUH (+ 0, I/3) galons = (-) galons (-) galons to X) = 0 galons = (-) galons (-) J FURCE VOLUME (+ 0, I/3) FURCE VOLUME (+			1 WELL VO				TIC DEPTH T		_		_	-	
icnty fill out if spplicable) = 0 gallons + (0.000% gallonafoot X 3/5 (ret) + 0.173 gallons = 0.5 gallons + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallons = 0.5 gallons + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallons = 0.5 gallons + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallons = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% gallonafoot X 3/5 (ret) + 0.173 gallona = 0.5 gallona + 0.000% ga	EQUIPME		URGE: 1 EQ	= (UIPMENT VO	fe L. = PUMP VOLU	et – ME + (TUE	ING CAPACI	feet) X TY X TU	JBING LENGTH	gallons/fo) + FLOW CE	ot =	gallon	
DEPTH IN WELL (feet) ▲I DEPTH IN WELL (feet) ▲I INITIATED AT: [US] PURGED (SDEAT: [UQ] PURGED (Gallons) O.S TIME VOLUME (gallons) VOLUME (VOLUME (gallons)) PURGED (gallons) DEPTH (WT) (PURGED (gallons) DEPTH (WT) (PURGED (gallons) PURGED (Gallons) DEPTH (WT) (PURGED (gallons) PURGED (Gallons) DEPTH (WT) (PURGED (gallons) DEPTH (WT) (PURGED (gallons) PURGED (Gallons) DEPTH (WT) (PURGED (gallons) DEPTH (WT) (PURGED (gallons) DEPTH (WT) (PURGED (gallons) DEPTH (WT) (PURGED													
TIME VOLUME PURGED CUMUL PURGED (galons) CUMUL PURGED (galons) PURGED (galons) PURGED (galons) PURGED (galons) PURGED (galons) COLOR (galons) COLOR (galons) TURBIDITY (NTUs) COLOR (galons) ORP (mV) (D2U 0135 0.35 0.55 7.4C 5.47 35.95 US91 0.8 32.95 (LIGAL)	Contraction of the second s		G کا			الد	PURGIN		ENDED AT:	1021	TOTAL VO PURGED (LUME gallons): 0.2	
Sumplex Sumplex <t< td=""><td>TIME</td><td>PURGED</td><td>VOLUME PURGED</td><td>RATE</td><td>TO WATER (</td><td>standard</td><td></td><td>(circle units) μmhos/cm</td><td>OXYGEN (circle units) mg/L or</td><td></td><td></td><td></td></t<>	TIME	PURGED	VOLUME PURGED	RATE	TO WATER (standard		(circle units) μmhos/cm	OXYGEN (circle units) mg/L or				
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PUMP OR TUBING DEPTH IN WELL (reet): Image: state		Super contraction and the	10	1.42	Ali	M	- At-	1	INITIATED A	T: 1025	ENDED	T: 1035.	
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EKMW-121PE250 mLNONENNASO42-APPAPPEKMW-121PE250 mLHNO3 \checkmark \checkmark Sulfur, TotalAPP \checkmark EKMW-121PE250 mLHNO3 \checkmark \checkmark Sulfur, TotalAPP \checkmark EKMW-121PE250 mLHNO3 \checkmark \checkmark Fe, MnAPP \checkmark REMARKS:Well historication personality purges dry. Purge one eutopment volume prior to sampling. Sodium personality to tested in field with CHMETS colorimetric tubes. \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark MATERIAL CODES:AG = Amber Glass;CE - Clear Glass;PE = Polyethylene;PE = Polyethylene;S = Silicone;T = Teflor;O = Uter (Specify)	EKMW-12	3	AG	40 mL	H2S04		- C		тос		APP	1	
EKMW-12 1 PE 250 mL HN03 4.3 Sulfur, Total APP EKMW-12 1 PE 250 mL HN03 Image: Constraint of the state of the	EKMW-12	1	PE	250 mL	NONE				SO42		APP		
REMARKS: Well historically purges dry. Purge one equipment volume prior to sampling. Sodium persulfate tested in field with CHEMETS colorimetric tubes. Sole = 0 mg/L MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	EKMW-12	1	PE	250 mL	HNO3			42	Sulfur, T	fotal	APP		
Sodium persulfate tested in field with CHEMETS colorimetric tubes. MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)	EKMW-12	1	ΡE	250 mL	HNO3		4	42	Fe, Mr	n	APP	*	
Sodium persulfate tested in field with CHEMETS colorimetric tubes. $S_{2}O_{8} = O_{1}O_{1}O_{1}O_{2}O_{2}O_{2}O_{2}O_{2}O_{2}O_{2}O_{2$	DEMON					-							
	REMARKS	AACTI HISTORICE					npling.	5,08:	= Omg	IL			
	MATERIA	L CODES:	AG = Amber	Glass; CG	≓ Clear Glass;	PE = Poly	ethylene;	PP = Polypropyl	lene; S = Silic	one; T = T	eflon; O = (Other (Specify)	
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify) IOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.				RFPP = Rever	se Flow Peristaltic		SM = Straw		Gravity Drain);	-			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units **Temperature:** \pm 0.2 °C **Specific Conductance:** \pm 5% **Dissolved Oxygen:** all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity:** all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

WELL NO:	EKMW-13B			CAME		LOC EKMW-	ATION: J	ackso	onville, FL	- 1	DATE			
VVELL NO.				SAIVIP				TA			DATE:	11/5	19	
14/511				1			NG DA				1.			
WELL DIAMETER	(inches): 2	TUBING	3 TER (inches):			REEN IN	TERVAL to 23 fe		STATIC DI	-PTH R (feet): 2, (2		PURGE PUN DR BAILER:	IP TYPE	
WELL VOL	UME PURGE:									WELL CAPACI				
(only fill out	if applicable)		= (~	feet -	_			feet) X		gallons	ns/foot =		
		URGE: 1 EQU	IPMENT VOL	PMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TI			+ FLOW	CELL VOLU		gallo
(only fill out	if applicable)			= 0	gallons	+(0,	UC gallo	ns/foo	ot X	25 feet)	+ 0+	132 gall	ons = O	ر gallo
	MP OR TUBIN WELL (feet):	G 21		IP OR TUB	PURGING INITIATED AT: 121				PURGING ENDED AT:	1225	TOTAL MOLLIME		0	
		CUMUL.		DEPTH					OND.	DISSOLVED				
TIME	VOLUME PURGED	VOLUME	PURGE	PURGE TO (oH ndard	TEMP.	(circ	cle units)	OXYGEN (circle units)	TURBI		DLOR	ORP
	(gallons)	PURGED (gallons)	(gpm)	RATE WATER (gpm) (feet)		nits)	(°C)	μm <u>or</u>	hos/cm	% saturation	(NTL		scribe)	(mV)
1224	0.25	0.25	DUC	6.27	5	.82	26.07	_	578	0,56	12.3	3 00	ear	-64
				1				-1-				-		
					-	-								
					-									
				-	-									
				-	-			1						
	ACITY (Gallon:								3" = 0.37;	4" = 0.65;	5" = 1.02;	6" = 1.4	7; 12" =	= 5.88
	SIDE DIA. CAP								5/16" = 0.0			1/2" = 0.010		= 0.016
PURGING	EQUIPMENT C	ODES: B	= Bailer;	BP = Bladde			P = Electric	_		$\mathbf{PP} = \mathbf{Pe}$	eristaltic P	'ump; U	= Other (Specify)
SAMPLED	BY (PRINT) / A	FFILIATION:		SAMPLER						SAMDUNC.		CAM	DUNC	1300
A -	unson		inter		N	120		-		SAMPLING INITIATED AT: 1) END	PLING ED AT:	250
PUMP OR T	TUBING	,	3	TUBING	W	PE	3			ILTERED: Y		FILTE	R SIZE:	μr
DEPTH IN V		21	PY (N	MATERIAL			-12			n Equipment Ty		N		_
			ĭ						ed)	DUPLICATE:	0	N		
SAMP	LE CONTAINE	R SPECIFICA	TION	PRESERV			SERVATIO	N	FINIAL	INTENDE ANALYSIS A		SAMPLIN		IPLE PU
CAMPLE		WATERIAL	VOLUME				IN FIELD (r	mL)	FINAL pH	METHO	D	CODE	(mL	. per mini
SAMPLE ID CODE	# CONTAINERS	CODE	VOLUME USED				NIA		NVA	S2O8 (Persi	ulfate)	APP	~	-100
		CODE CHEMETS	25 mL			NA								
ID CODE	CONTAINERS		25 mL 40 mL	NA HCI			1			VOCs		APP		
ID CODE EKMW-13B	CONTAINERS 1	CHEMETS					-		42	VOCs TOC		APP		
ID CODE EKMW-13B EKMW-13B	CONTAINERS 1 3	CHEMETS CG	40 mL	HCI					22					-
ID CODE EKMW-13B EKMW-13B EKMW-13B	CONTAINERS 1 3 3	CHEMETS CG AG	40 mL 40 mL	HCI H2S04					KZ NA	тос	Sulfur	APP		
ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAINERS 1 3 3 1	CHEMETS CG AG PE	40 mL 40 mL 250 mL	HCI H2S04 NONE					27 77 NA 79.	TOC SO4 ²⁻	Sulfur	APP APP		+
ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAINERS 1 3 3 1 3 1 3 1 Well historica	CHEMETS CG AG PE PE	40 mL 40 mL 250 mL 250 mL 500 mL Purge one eq	HCI H2S04 NONE HNO3 NONE uipment vol	ume prio	r to samp		S ₂ (LA LA NA LA. NA	TOC SO4 ²⁻ Na⁺; Fe, Mn;	Sulfur	APP APP APP		+++
ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAINERS 1 3 3 1 3 1 Vell historica Sodium persu	CHEMETS CG AG PE PE PE Illy purges dry.	40 mL 40 mL 250 mL 250 mL 500 mL Purge one eq field with CH	HCI H2S04 NONE HNO3 NONE uipment vol	ume prio rimetric t	r to samp	ling.		22 NA 22 NA 23. NA 05 : 0	TOC SO4 ²⁻ Na⁺; Fe, Mn; TDS		APP APP APP APP) = Other	

JIES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE DCATION: `	Jacksonville, FL		_		
ELL NO	EKMW-14			SAMPLE	EID: EKM	V-14			DATE:	11519	
					PURC	SING DA	TA				
WELL VO	R (inches): 2 LUME PURGE: ut if applicable)	DIANE	TER (inches)	14 DEI		et to 23 f	Feet TO WATE	R (feet): Y.	11 0	URGE PUMP T R BAILER:	PPE PP
	NT VOLUME Pl at if applicable)	JRGE: 1 EQI	= (JIPMENT VO			ing capaci				CELL VOLUME	= 0, Sgallons
	UMP OR TUBIN I WELL (feet):	G 19	FINAL PU DEPTH IN	MP OR TUBIN I WELL (feet):	3192 AR		IG ED AT: 1302		1327	TOTAL VO PURGED (LUME gallons): 1.25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm <u>or</u> μ6/cm	DISSOLVED OXYGEN (circle units) fool or % saturation	TURBID (NTU:		
1325	Drast	6.35	0.05	» 11.10	5.84	de.lele	3896	0,44	24.7	Clea	W -115.9
				_							
	÷		_								
			-								
				-					1		
		-									
TUBING I	PACITY (Gallon NSIDE DIA. CAP	PACITY (Gal./			' = 0.0014;	1/4" = 0.002		004; 3/8'' = 0	5" = 1.02; 0.006; 1 eristaltic Pu	6" = 1.47; /2" = 0.010; /mp: 0 = 0	12 " = 5.88 5/8 " = 0.016 Other (Specify)
UNGING			- Daller,	Dr - Diauter		LING DA		пр, гг-г	enstante Fu	mp, 0 -0	Stier (Specify)
SAMPLED	BY (PRINT) / A	FFILIATION:	intec	SAMPLER(S			-	SAMPLING INITIATED A	T: 133		NG AT: 1340
		2107	19	TUBING MATERIAL C		-5		-FILTERED: Y		FILTER 8	SIZE:µm
	CONTAMINATIC	DN: PUM		()	TUBING	F R)(n	eplaced)	DUPLICATE:		Ø	
	PLE CONTAINE					RESERVATIO		INTEND		SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVAT USED	IVE	TOTAL VOL D IN FIELD (FINAL	ANALYSIS A METHC	ND/OR	EQUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-14	1	CHEMETS	25 mL	NA		NA	NA	S2O8 (Pers	ulfate)	APP	NOU
EKMW-14	3	AG	40 mL	H2S04			12	тос		APP	
EKMW-14	1	PE	250 mL	NONE			NA	SO42-		APP	
EKMW-14	1	- PE	250 mL	HNO3		_	12	Sulfur, T	otal	APP	
EKMW-14	1	PE	250 mL	HNO3		*	42	Fe, Mn		APP	V
REMARKS	VVCII III SLORICE			quipment volun EMETS colorin		npling. 📣	extra pur Sz08 =	e due 0 mg/		Hally	nigh turs
MATERIAI SAMPLING	G EQUIPMENT	F	APP = After P RFPP = Rever	⇒ Clear Glass; eristaltic Pump; se Flow Perista the informat	ltic Pump;	ler; BP = SM = Straw	PP = Polypropyl Bladder Pump; Method (Tubing	ESP = Elect Gravity Drain);	ric Submers		Other (Specify)

The above do not constitute all of the information required by Chapter 62-160, F.A.C.
 STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
 pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР					TE DCATION:	Jackso	nville, FL				
	EKMW-11			SAN	PLE ID:						DATE:	1/19/2019	
					F	PURC	SING DA	TA					
	R (inches): 2		ETER (inches):	1/4	WELL SO DEPTH:	CREEN 19 fe	INTERVAL et to 23 f	eet	STATIC DI TO WATE	R (feet): 4.	16 0	URGE PUMP 1 PR BAILER:	PPE PP
(only fill ou	LUME PURGE: It if applicable) NT VOLUME P It if applicable)		= (23-	feet VOLUME	- + (TUB	-	TY	feet) X X TU	BING LENGTH	gallons/	foot ≖ CELL VOLUME	galions
	JMP OR TUBIN WELL (feet):	IG 21	FINAL PU DEPTH IN		BING	21	PURGIN	IG		PURGING ENDED AT		TOTAL VC	
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gallons)	PURGE RATE	DEPT TO WATE (feet	H R (sta	pH andard inits)	TEMP- (°C)	circl) برسا	OND le units) hos/cm pS/cm	DISSOLVED OXYGEN (circle units) mg/ or % saturation	TURBIE (NTU		
1444	0.25	0.25	0.025	4.98	5	38	26.65	6	783	0.66	6.87	LLEA	R 33.8
SAMPLED	PACITY (Gallor NSIDE DIA. CAI EQUIPMENT (BY (PRINT) / A AIZ AH AZT TUBING WELL (feet):	PACITY (Gal CODES:	/Ft.): 1/8'' = 0 B = Bailer;				1/4" = 0.002 SP = Electric	26; Subme	FIELD-		Peristaltic Pu AT:)450	/2" = 0.010; ump; O = 0 SAMPLI ENDED	12" = 5.88 5/8" = 0.016 Dther (Specify) NG AT: J45-8 SIZE:μm
FIELD DEC	CONTAMINATIO	DN: PU	MP Y C	5	ΤL	BING	Y N	eplaced	d) ALREADT	DUPLICATE	Y Y	(\mathbb{N})	
SAM SAMPLE ID CODE	PLE CONTAINE # CONTAINERS	ER SPECIFIC MATERIAL CODE	ATION VOLUME	PRESER	VATIVE	Г	RESERVATIO TOTAL VOL D IN FIELD (1	1	FINAL pH	INTEND ANALYSIS METH	AND/OR	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA			- -		5.38	S2O8 (Per	sulfate)	APP	4100
EKMW-11	3	AG	40 mL	H2S0)4		_		42	тос		APP	1
EKMW-11	1	PE	250 mL	NON	E		~		5.38	SO4 ²	-	APP	
EKMW-11	1	PE	250 mL	HNC	3				42	Sulfur,	Fotal	APP	ł
EKMW-11	1	PE	250 mL	HNC	03		-		42	Fe, M	n .	APP	
						_							
REMARKS	Sodium pers	ulfate tested	y. Purge <u>one e</u> in field with CH	EMETS co	orimetric	tubes,					!,		
	CODES: EQUIPMENT	CODES:	Glass; CG APP = After Pe RFPP = Rever stitute all of	eristaltic Pu se Flow Pe	mp; ristaltic P	B = Bai ump;	ler; BP = SM = Straw	Bladdo Metho		ESP = Elec Gravity Drain);	tric Submer	Teflon; O = sible Pump; her (Specify)	Other (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units **Temperature:** \pm 0.2 °C **Specific Conductance:** \pm 5% **Dissolved Oxygen:** all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity:** all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

					L	DCATION "	icksonville, FL				
WELL NO:	EKMW-12			SAMPL	EID: EKM	N-12			DATE: I	1/19/2019	
			-		PUR	GING DAT	A				
WELL DIAMETER			ETER (inches)	: '14 de	ELL SCREEN PTH: 19 fe	INTERVAL eet to 23 fe	et TO WAT	ER (feet): 4.8	з о	URGE PUMP 1 R BAILER:	YPE PP
(only fill out	if applicable)		= (-	feet -	TIC DEPTH TO	feet)	WELL CAPAC	gallons/		<u> </u>
	if applicable)				,	.0020 gallor)+ 0.13		= 0.1 9 ga
INITIAL PUI DEPTH IN \	MP OR TUBIN WELL (feet):	G 2 1		IMP OR TUBIN WELL (feet):		PURGING		PURGING		TOTAL VC	
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gallons)	PURGE	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^o C)	COND. (circle units) µmhos/cm or uS/cm	DISSOLVED OXYGEN (circle.units) og/L_br % saturation	TURBIC (NTU		
-MAINAN 3	0.25	6.25	0.025	• ¶,¶Ø	5.79	26.76	3023	0.39	13.4	UEA	e -45.
										_	_
				-			~				
			_								
			_	_							
				1 ³¹ = 0.04;					5 " = 1.02;	6" = 1.47	12 " = 5.88
TUBING IN:		PACITY (Gal.			" = 0.0014	6; 2" = 0.16 1/4" = 0.0026 SP = Electric S	5/16" = (0.004; 3/8 " = 0		/2" = 0.010;	12 " = 5,88 5/8 " = 0,016 Other (Specify
TUBING IN	SIDE DIA. CAI	PACITY (Gal.	/Ft.): 1/8" = (0.0006; 3/16	" = 0.0014; Pump; E	1/4" = 0.0026	5/16'' = (Submersible P	0.004; 3/8 " = 0	0.006; 1	/2" = 0.010;	5/8'' = 0,016
TUBING IN PURGING E	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A	PACITY (Gal. CODES: I	/Ft_): 1/8'' = (B = Bailer;	0.0006; 3/16 BP = Bladder	" = 0.0014; Pump; E	1/4" = 0.0026 SP = Electric S	5/16'' = (Submersible P	3/8 ⁱⁱ = 0 ump; PP = P SAMPLING	0.006; 1 eristaltic Pu	/2" = 0.010; ump; O = 0	5/8'' = 0,016 Other (Specify
	SIDE DIA. CAI EQUIPMENT (BY (PRINT) / A DARN HART	PACITY (Gal. CODES: I	/Ft.): 1/8'' = (B = Bailer;	BP = Bladder	" = 0.0014; Pump; E	1/4" = 0.0026 SP = Electric S	5/16" = (Submersible P	0.004; 3/8 ^ú = 0 ump; PP = P SAMPLING INITIATED A	D.006; 1 eristaltic Pu T: 15 2	12" = 0.010; ump; O = 0 3 SAMPLI	5/8" = 0,016 Other (Specify NG AT: 15 30
TUBING IN PURGING E	SIDE DIA. CAI EQUIPMENT (BY (PRINT) / A BY (PRINT) / A A A RH HART TUBING	PACITY (Gal. CODES: I	/Ft.): 1/8'' = (B = Bailer;	0.0006; 3/16 BP = Bladder	" = 0.0014; Pump; E SAMF	1/4" = 0.0026 SP = Electric S	5/16" = (Submersible P TA FIEL	3/8 ⁱⁱ = 0 ump; PP = P SAMPLING	0.006; 1 eristaltic Pu T: 15 2	12" = 0.010; ump; O = 0 3 SAMPLI	5/8'' = 0,016 Other (Specify
SAMPLED F	SIDE DIA. CAI EQUIPMENT (BY (PRINT) / A BY (PRINT) / A A A RH HART TUBING		/Ft.): 1/8" = (B = Bailer; ふすを	D.0006; 3/16 BP = Bladder SAMPLER(S TUBING	" = 0.0014; Pump; E SAMF	1/4" = 0.0026 SP = Electric S LING DA	5/16" = (Submersible P TA FIEL Filtra	0.004; 3/8 ^ú = 0 ump; PP = P SAMPLING INITIATED A D-FILTERED: Y	0.006; 1 eeristaltic Pu T: 15 2 (No) (pe:	12" = 0.010; ump; O = 0 3 SAMPLI	5/8" = 0,016 Other (Specify NG AT: 15 30
SAMPLED I PURGING E PUMP OR T DEPTH IN V FIELD DEC	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A DARA HART TUBING WELL (feet):	REFLUATION: CODES: I REFLUATION: Correst Z (DN: PUI	/Ft.): 1/8" = ۱ B = Bailer; معتقد	D.0006: 3/16 BP = Bladder SAMPLER(S DW TUBING MATERIAL C	" = 0.0014; Pump; II SAMF CODE: Pi TUBING	1/4" = 0.0026 SP = Electric S LING DA	5/16" = (Submersible P TA FIEL Filtra	0.004; 3/8" = 0 ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty DUPLICATE: INTEND	D.006; 1 eristaltic Pu T: 15 2 //pe: ED	12" = 0.010; JMP; O = 0 3 SAMPLI 5 SAMPLING	5/8" = 0.01€ Dther (Specify NG AT: /5 3⊂ SIZE: SAMPLE F
TUBING IN PURGING E SAMPLED I PUMP OR T DEPTH IN V FIELD DEC SAMPLE	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A DARN HART TUBING WELL (feet): ONTAMINATIO DE CONTAINE #	REFLICATION: CODES: I REFLICATION: C. FOR 2 (DN: PUI ER SPECIFIC MATERIAL	/Ft.): 1/8" = ۱ B = Bailer; معتقد	D.0006: 3/16 BP = Bladder SAMPLEK(S TUBING MATERIAL (N PRESERVA	" = 0.0014; Pump; E SAMF CODE: P TUBING SAMPLE P TIVE	1/4" = 0.0026 SP = Electric S LING DA Y Y RESERVATION TOTAL VOL	5/16" = (Submersible P TA FIEL Filtra	2.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty	D.006; 1 eristaltic Pu T: 15 2 ype: Y ED ND/OR	12" = 0.010; JIMP; O = 0 3 SAMPLI ENDED FILTER	5/8" = 0,016 Other (Specify NG AT: /5 3⊄ SIZE:
TUBING IN PURGING E SAMPLED T PUMP OR T DEPTH IN V FIELD DEC SAMPLE	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A DARNHART TUBING WELL (feet): ONTAMINATIO PLE CONTAINE	REFLICATION: CODES: I AFFILIATION: C FOST Z (DN: PUI ER SPECIFIC	/Ft.): 1/8 " = i B = Bailer; хэт Ес MP Y (ATION	D.0006: 3/16 BP = Bladder SAMPLER(S TUBING MATERIAL (" = 0.0014; Pump; E SAMF CODE: P TUBING SAMPLE P TIVE	1/4" = 0.0026 SP = Electric S LING DA SI Y RESERVATION	5/16" = (Submersible P TA FIEL Filtra	0.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty DUPLICATE: INTEND ANALYSIS A	D.006; 1 eristaltic Pu T: 15 2 (pe: : Y ED ND/OR DD	12" = 0.010; 1mp; O = 0 3 SAMPLI FILTER SAMPLING EQUIPMENT	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R
TUBING IN PURGING E SAMPLED I PUMP OR T DEPTH IN V FIELD DEC SAMPLE ID CODE	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A PARTHART UBING WELL (feet): ONTAMINATION CONTAINERS	REFLICATION CODES: I REFLICATION Constant Constant Constant Code I I I I I I I I I I I I I	/Ft.): 1/8'' = I B = Bailer; ЮР Ү (ATION VOLUME	D.0006: 3/16 BP = Bladder SAMPLER(S TUBING MATERIAL (N PRESERVA USED	" = 0.0014; Pump; E SAMF CODE: P TUBING SAMPLE P TIVE	1/4" = 0.0026 SP = Electric S LING DA SI Y RESERVATION TOTAL VOL ED IN FIELD (m	5/16" = (Submersible P TA FIEL Filtra Naced)	2.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty DUPLICATE: ANALYSIS A METHC	D.006; 1 eristaltic Pu T: 15 2 (pe: : Y ED ND/OR DD	12" = 0.010; JIMP; O = 0 3 SAMPLI FILTER SAMPLING EQUIPMENT CODE	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R (mL per m
TUBING IN: PURGING E SAMPLED I DUMP OR T DEPTH IN V FIELD DEC SAMP SAMPLE ID CODE EKMW-12	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A DARN HART TUBING WELL (feet): ONTAMINATION PLE CONTAINE # CONTAINERS 1	ACITY (Gal. CODES: I AFFILIATION: Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservation Conservati	۲,Ft.): 1/8" = ۱ B = Bailer; ۲,۲,۶ MP Y (ATION VOLUME 25 mL	D.0006: 3/16 BP = Bladder SAMPLER(S TUBING MATERIAL (NA PRESERVA USED NA	" = 0.0014; Pump; E SAMF CODE: P TUBING SAMPLE P TIVE	1/4" = 0.0026 SP = Electric S LING DA S Y RESERVATION TOTAL VOL ED IN FIELD (m	5/16" = (Submersible P TA FIEL Filtra slaced)	2.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty DUPLICATE: UNTEND ANALYSIS A METHC S208 (Pers	D.006; 1 eristaltic Pu T: 15 2. (pe: ED ND/OR DD sulfate)	12" = 0.010; Imp; O = 0 3 SAMPLI FILTER SAMPLING EQUIPMENT CODE APP	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R (mL per m
TUBING INS PURGING E SAMPLED I DEPTH INV FIELD DEC SAMP SAMPLE ID CODE EKMW-12 EKMW-12	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A DARWHART TUBING WELL (feet): ONTAMINATIO PLE CONTAINERS 1 3	ACITY (Gal. CODES: I FFILIATION: Construction Construction Construction Chemets AG	<pre>/Ft.): 1/8" = i B = Bailer; B = Bailer; MP Y < ATION VOLUME 25 mL 40 mL</pre>	D.0006: 3/16 BP = Bladder SAMPLER(S TUBING MATERIAL (N PRESERVA USED NA H2S04	" = 0.0014; Pump; E SAMF CODE: P TUBING SAMPLE P TIVE	1/4" = 0.0026 SP = Electric S LING DA S Y RESERVATION TOTAL VOL ED IN FIELD (m	5/16" = (Submersible P TA FIEL Filtra slaced) FINAL L) FINAL C.79 L2	2.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty DUPLICATE: ANALYSIS A METHO S208 (Pere TOC	D.006; 1 eristaltic Pu T: 15 2 ype: Y ED ND/OR DD sulfate)	12" = 0.010; ump; 0 = 0 3 SAMPLI 5 SAMPLING EQUIPMENT CODE APP APP	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R (mL per m
TUBING INS PURGING E SAMPLED I DEPTH IN V FIELD DEC SAMPLE ID CODE EKMW-12 EKMW-12	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A PRIMART UBING WELL (feet): ONTAMINATION CONTAINERS 1 3 1	ACITY (Gal. CODES: I AFFILIATION: Correction Correction Con: PUI ER SPECIFIC MATERIAL CODE CHEMETS AG PE	<pre>/Ft.): 1/8" = i B = Bailer; B = Bailer; MP Y < ATION VOLUME 25 mL 40 mL 250 mL</pre>	D.0006: 3/16 BP = Bladder SAMPLEF(S TUBING MATERIAL O N PRESERVA USED NA H2S04 NONE	" = 0.0014; Pump; E SAMF CODE: P TUBING SAMPLE P TIVE	1/4" = 0.0026 SP = Electric S LING DA S Y RESERVATION TOTAL VOL ED IN FIELD (m	5/16" = (Submersible P TA FIEL Filtra slaced) FINAL pH 5.71 4.2 5.71	D.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment Ty DUPLICATE: ANALYSIS A METHC S208 (Pers TOC SO4 ²⁻	D.006; 1 eristaltic Pu T: 15 2 (N) (pe: Y ED (ND/OR D) Sulfate)	12" = 0.010; Imp; O = 0 3 SAMPLI ENDED FILTER SAMPLING EQUIPMENT CODE APP APP APP	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R (mL per m
TUBING INS PURGING E SAMPLED IN PUMP OR TO DEPTH IN V FIELD DEC SAMPE ID CODE EKMW-12 EKMW-12 EKMW-12	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A DARWHART TUBING WELL (feet): ONTAMINATIO PLE CONTAINERS 1 3 1 1 1 1 1 1 1 1	PACITY (Gal. CODES: I AFFILIATION: CAROST Z (DN: PUI ER SPECIFIC CHEMETS AG PE PE PE PE	<pre>/Ft.): 1/8'' = i B = Bailer; B = Bailer; MP Y (ATION VOLUME 250 mL 250 mL 250 mL 250 mL</pre>	D.0006: 3/16 BP = Bladder SAMPLER(S TUBING MATERIAL (NA PRESERVA USED NA H2S04 NONE HNO3	TUBING	1/4" = 0.0026 SP = Electric S LING DA Y NO RESERVATION TOTAL VOL D IN FIELD (m 	5/16" = (Submersible P TA FIEL Filtra slaced) FINAL pH 5.71 4.2 5.71 4.2	2.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment T, DUPLICATE: ANALYSIS A METHO S208 (Pers TOC S04 ²⁻ Sulfur, T	D.006; 1 eristaltic Pu T: 15 2 (N) (pe: Y ED (ND/OR D) Sulfate)	12" = 0.010; Imp; O = 0 3 SAMPLI ENDED FILTER SAMPLING EQUIPMENT CODE APP APP APP APP	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R (mL per m
TUBING INS PURGING E SAMPLED I DEPTH INV FIELD DEC SAMP SAMPLE ID CODE EKMW-12 EKMW-12 EKMW-12 EKMW-12 EKMW-12	SIDE DIA. CAI EQUIPMENT C BY (PRINT) / A VELL (Feet): ONTAMINATION CONTAINERS 1 3 1 1 1 1 1 1 1 1 1 1	ACITY (Gal. CODES: I AFFILIATION: C FOST 2 (DN: PUI ER SPECIFIC MATERIAL CODE CHEMETS AG PE PE PE PE PE	/Ft.): 1/8" = i B = Bailer; B = Bailer; MP Y (ATION VOLUME 25 mL 250 mL 250 mL 250 mL 250 mL	D.0006: 3/16 BP = Bladder SAMPLER(S MATERIAL (NATERIAL (NA PRESERVA USED NA H2S04 NONE HN03 HN03 equipment volu	TUBING	1/4" = 0.0026 SP = Electric S LING DA SF Y NG RESERVATION TOTAL VOL ED IN FIELD (m 	5/16" = (Submersible P TA FIEL Filtra slaced) FINAL pH 5.71 4.2 5.71 4.2 5.71 4.2 5.71	2.004; 3/8" = (ump; PP = P SAMPLING INITIATED A D-FILTERED: Y tion Equipment T, DUPLICATE: ANALYSIS A METHO S208 (Pers TOC S04 ²⁻ Sulfur, T	D.006; 1 eristaltic Pu T: 15 2 ype: Y ED ND/OR DD Sulfate)	12" = 0.010; JIMP; O = 0 3 SAMPLI FILTER SAMPLING EQUIPMENT CODE APP APP APP APP	5/8" = 0.01€ Dther (Specify NG AT: /5 3℃ SIZE: SAMPLE F FLOW R (mL per m

pH: \pm 0.2 units **Temperature**: \pm 0.2 °C **Specific Conductance**: \pm 5% **Dissolved Oxygen**: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity**: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

	NAS JAX EK	TAP			SI LC	CATION: Ja	acksonville, FL				
NELL NC	EKMW-13B			SAMPLE	EID: EKMV	V-13B		C	DATE: II	19 2019	
					PURC	SING DA	ГА				
	R (inches): 2	DIAN	ETER (inches)	: 1/4 DEI		et to 23 fe		4	6 OF	JRGE PUMP T R BAILER:	PP PP
(only fill of EQUIPME	It if applicable)		= (23	feet –	-	feet) X	JBING LENGTH)	gallons/f		- gallons
uniy nii u	it il applicable)			= - g	allons + (o.c	ooze galloi	ns/foot X 2.4	- feet) ·	+ 0.132	gallons	= \mathcal{O} , \mathfrak{P} gallons
	UMP OR TUBIN I WELL (feet):	G 21		MP OR TUBIN WELL (feet):	g 21	PURGING	G DAT: 1543	PURGING ENDED AT:		TOTAL VO PURGED (
тіме	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gallons)	PURGE RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) umhos/cm	DISSOLVED OXYGEN (circle units) mg/ or % saturation	TURBID (NTUs		
1553	0.25	0.25	0.025	7.48	5.71	26.24	3414	0.37	7.45	CEAR	-47.4
			_								
			_								
			_								
			_								
	PACITY (Gallor								" = 1,02;	6" = 1,47;	12" = 5.88
	NSIDE DIA. CA				" = 0.0014;	1/4" = 0.0026				2" = 0.010;	5/8 " = 0.016
URGING	EQUIPMENT	ODES:	B = Bailer;	BP = Bladder		SP = Electric S	Submersible Pur	mp; PP = Pe	ristaltic Pu	mp; O = C	Other (Specify)
SAMPLED	BY (PRINT) / A	FEILATION		SAMPLER(
J.i	BARNHART	- Greost		6	Charle.	1		SAMPLING	1558	SAMPLIN	AT:: 1015
	TUBING	/		TUBING	PE		FIELD-	-FILTERED: Y		FILTER S	SIZE:μm
	WELL (feet);										
		21		MATERIAL C	002.		Filtratio	on Equipment Typ			
	CONTAMINATIO		MP Y C		TUBING	Y CD	Filtratio			Ν	1
TELD DE	CONTAMINATIO	DN: PU			TUBING SAMPLE PF		Filtratic placed) N	DUPLICATE INTENDE		SAMPLING	SAMPLE PUMP
FIELD DE SAM SAMPLE	CONTAMINATIO PLE CONTAINE #	DN: PU ER SPECIFIC MATERIAL		PRESERVAT	TUBING SAMPLE PF	Y NO	Filtratic placed) N FINAL	DUPLICATE:	D ID/OR		SAMPLE PUMP FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE D CODE	CONTAMINATIO	DN: PU	CATION		TUBING SAMPLE PF		Filtratic placed) N FINAL	DUPLICATE INTENDE ANALYSIS AN	D ID/OR	SAMPLING EQUIPMENT	FLOW RATE
FIELD DE SAM SAMPLE ID CODE EKMW-13B	CONTAMINATIO PLE CONTAINE #	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS	VOLUME	PRESERVAT	TUBING SAMPLE PF	Y NO	Filtratic placed) N hL) FINAL pH	DUPLICATE DUPLICATE INTENDE ANALYSIS AN METHOD	D ID/OR	SAMPLING EQUIPMENT CODE	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE D CODE KMW-13B EKMW-13B	CONTAMINATION PLE CONTAINE CONTAINERS	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG	VOLUME	PRESERVAT USED NA	TUBING SAMPLE PF	Y NIP	Filtratic placed) N FINAL pH - L 2	DUPLICATE DUPLICATE INTENDE ANALYSIS AN METHOD S208 (Persu	D ID/OR	SAMPLING EQUIPMENT CODE APP	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE D CODE KMW-13B KMW-13B	CONTAMINATION PLE CONTAINE CONTAINERS	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG	CATION VOLUME 25 mL 40 mL	PRESERVAT USED NA HCI	TUBING SAMPLE PF	Y NO	Filtratic placed) N FINAL pH - L 2 5 · 71	DUPLICATE UPLICATE INTENDE ANALYSIS AN METHOD S208 (Persu VOCs	D ID/OR	SAMPLING EQUIPMENT CODE APP APP	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE D CODE KMW-13B KMW-13B KMW-13B	CONTAMINATION PLE CONTAINE CONTAINERS	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG	CATION VOLUME 25 mL 40 mL 40 mL 250 mL	PRESERVAT USED NA HCI H2S04 NONE	TUBING SAMPLE PF	Y NO RESERVATION TOTAL VOL D IN FIELD (n	Filtratic placed) N FINAL pH 2 2 5 · 71 5.71	DUPLICATE INTENDE ANALYSIS AN METHOE S208 (Persu VOCs TOC S04 ²⁻	D ID/OR ()	SAMPLING EQUIPMENT CODE APP APP APP	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAMINATION PLE CONTAINERS 1 3 3 1	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE	CATION VOLUME 25 mL 40 mL 40 mL 250 mL 250 mL	PRESERVAT USED NA HCI H2S04	TUBING SAMPLE PF	Y NO	Filtratic placed) N FINAL pH - L 2 5 · 71	DUPLICATE UNTENDE ANALYSIS AN METHOD S208 (Persu VOCs TOC	D ID/OR ()	SAMPLING EQUIPMENT CODE APP APP APP APP APP	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAMINATION PLE CONTAINERS 1 3 3 1 3 1 3	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE PE	CATION VOLUME 25 mL 40 mL 250 mL 250 mL 500 mL	PRESERVAT USED NA HCI H2S04 NONE HNO3 NONE		Y NO	Filtratic placed) N FINAL pH - 2 2 5 71 5.71 2 2 - - - - - - - - - - - - -	n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD S208 (Persu VOCs TOC S04 ²⁻ Na*; Fe, Mn; TDS	DD/OR () Ifate) Sulfur	SAMPLING EQUIPMENT CODE APP APP APP APP APP APP	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAMINATION PLE CONTAINERS 1 3 3 1 3 5 Well historic:	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE PE ally purges dr	CATION VOLUME 25 mL 40 mL 40 mL 250 mL 250 mL 309 mL 909 mL 909 mL	PRESERVAT USED NA HCI H2S04 NONE HNO3	TUBING SAMPLE PP IVE ADDE	Y NO	Filtratic placed) N FINAL pH 2 2 5 · 71 5.71	n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD S208 (Persu VOCs TOC S04 ²⁻ Na*; Fe, Mn; TDS	DD/OR () Ifate) Sulfur	SAMPLING EQUIPMENT CODE APP APP APP APP APP APP	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE ID CODE EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B EKMW-13B	CONTAMINATION PLE CONTAINERS 1 3 3 1 3 5 Well historic:	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE PE ally purges dr	CATION VOLUME 25 mL 40 mL 250 mL 250 mL 500 mL 500 mL 500 mL 500 mL	PRESERVAT USED NA HCI H2S04 NONE HNO3 NONE quipment volum	TUBING SAMPLE PP IVE ADDE	Y N(P RESERVATION TOTAL VOL D IN FIELD (n - - - - - - - - - - -	Filtratic placed) N FINAL pH - 2 2 5 71 5.71 2 2 - - - - - - - - - - - - -	n Equipment Typ DUPLICATE INTENDE ANALYSIS AN METHOD S208 (Persu VOCs TOC SO4 ²⁻ Na*; Fe, Mn; TDS	DD/OR D/OR Sulfur	SAMPLING EQUIPMENT CODE APP APP APP APP APP APP APP E E	FLOW RATE (mL per minute)
FIELD DE SAM SAMPLE ID CODE KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B	CONTAMINATION PLE CONTAINERS 1 3 3 1 3 5 Well historica Sodium pers	DN: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE PE ally purges dr ulfate tested AG = Amber CODES:	CATION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL 300 mL 300 mL r Glass; CG APP = After P	PRESERVAT USED NA HCI H2S04 NONE HN03 NONE HN03 NONE Coloring	TUBING SAMPLE PF IVE ADDE ADDE	Y N(P RESERVATION TOTAL VOL D IN FIELD (n - - - - - - - - - - - - - - - - - - -	Filtratic placed) N FINAL pH - L 2 5.71 5.71 L 2 D P- 0	n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD S208 (Persu VOCs TOC S04 ²⁻ Na ⁺ ; Fe, Mn; TDS I TATEA ene; S = Silicor ESP = Electric	C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C	SAMPLING EQUIPMENT CODE APP APP APP APP APP E E Teflon; O = 1	FLOW RATE (mL per minute)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP				TE CATION:	Jacksonville, FL				
WELL NO	EKMW-14			SAMPLE	ID: EKMV	V-14			DATE: II	19 2019	
L					PURC	SING DA	ATA		- 1		
WELL DIAMETE	· ·	DIAN	ETER (inches)	- 14 DEP		et to 23	feet TO WATE	ER (feet): 4.25	OR OR	RGE PUMP T BAILER:	
	LUME PURGE: t if applicable)	1 WELL VC	DLUME = (TO = (TH – STA feet–	TIC DEPTH	TO WATER) X	WELL CAPAC	galions/fc	iot 🐨	gallons
	NT VOLUME P t if applicable)	URGE: 1 EQ		L. = PUMP VOL	UME + (TUB	ING CAPAC ∞2¢ gali	NTY X TU	JBING LENGTH) + FLOW CI	ELL VOLUME	_
	JMP OR TUBIN WELL (feet):	IG 21		MP OR TUBING I WELL (feet):		PURGI		PURGING	1630	TOTAL VO PURGED (LUME gallons): 0.25
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (galions)		DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND: (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) mg/_20r % saturation	TURBIDI (NTUs)		
1630	0.25	0.25	0.025	- 7.72	5,93	25,12	3319	0.57	47.6	FOG G	7 -58.1
										¥ 526	
										<i>QEMA</i>	5 KJ
				_							
WELLCAR	ACITY (Gallor	Per Epot	0.75" - 0.02	1" = 0.04;	1 25" - 0.04	6; 2 " = 0,	16; 3 " = 0.37;	4" = 0.65;	5'' = 1.02;	6 " = 1,47;	12" = 5.88
				00006; 3/16 "						2" = 0.010;	5/8'' = 0.016
PURGING	EQUIPMENT	ODES: E	3 = Bailer;	BP = Bladder P			Submersible Pu	mp; PP = P	eristaltic Pur	np; O = C	Other (Specify)
SAMPLED	BY (PRINT) / A	FEILIATION		SAMPLER(\$)		LING D	ΑΤΑ	1			
J.	BARNHA	1 1	SYNTEL	Jus	Dh	t		SAMPLING INITIATED A		ENDED	NG 1642
PUMP OR DÉPTH IN	TUBING WELL (feet):	21		TUBING MATERIAL CO	DDE: PL	E,S		-FILTERED: Y on Equipment Ty		FILTER S	SIZE:μm
		DN: PUI	MP Y 🖉	D	TUBING	Y	eplaced)	DUPLICATE		(N)	
SAM		ER SPECIFIC	ATION		SAMPLE PR	ESERVATIO	NC	INTEND	ED	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATI USED		OTAL VOL D IN FIELD	(mL) FINAL	ANALYSIS A METHC		CODE	FLOW RATE (mL per minute)
EKMW-14	1	CHEMETS	25 mL	NA		-		S2O8 (Pers	sulfate)	APP	6100
EKMW-14	3	AG	40 mL	H2S04		-	12	тос		APP	1
EKMW-14	1	PE	250 mL	NONE				SO4 ^{2.}		APP	
EKMW-14	1	PE	250 mL	HNO3		-	22	Sulfur, T	otal	APP	1
EKMW-14	1	PE	250 mL	HNO3		-	42	Fe, Mn		APP	
REMARKS	Mall history		. Dunne			malia	Y CONTAINS	4 - 1650	I LITTE		
	even matoria			quipment volume EMETS colorime		npling	•	NDED SOLJ			
MATERIAL	CODES:	AG = Amber		= Clear Glass;	PE = Poly			ene; S = Silic			Other (Specify)
	EQUIPMENT		RFPP = Rever	eristaltic Pump; se Flow Peristal		SM = Straw	= Bladder Pump; v Method (Tubing ter 62-160, F.A	Gravity Drain);	ric Submersi O = Othe	ble Pump; er (Specify)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE CATION:	Jackso	onville, FL						
WELL NO	: EKMW-11			SAMPLE ID:	EKMV	V-11				DATE:	12	103/2	5-1 Y	
					PURG	ING DA	TA							
WELL DIAMETE	R (inches):		NG ETER (inches)			INTERVAL et to 23 f	eet	STATIC C		0	PURG	E PUMP T	YPE P	2
	LUME PURGE			TAL WELL DEPTH						TY				
EQUIPME	NT VOLUME P	URGE: 1 EC	= (UIPMENT VO	L. = PUMP VOLUM	t – E + (TUB	ING CAPACI	TY	feet) X	JBING LENGTH	gallor) + FLOV	ns/foot N CELL	VOLUME	-	gallons
	ut if applicable)					026 gallo							= 0	2 gallons
	UMP OR TUBIN		FINAL PL	IMP OR TUBING		PURGIN	G		PURGING		Т	OTAL VO	LUME	
DEPTH IN	WELL (feet):	2.1	DEPTH IN	NWELL (feet):	21			1100	ENDED AT: DISSOLVED	11.5	F	URGED (g	gallons): 0.75
TIME	VOLUME PURGED (galions)	CUMUL. VOLUME PURGED (gallons)	RATE	MATER (S	pH tandard units)	TEMP; (^o C)	(ciro μm	COND. cle units) hos/cm	OXYGEN (circle units) mg/ or % saturation		BIDITY TUs)	COLO (descrit		ORP (mV)
1115	2500	0.75	0.75	7.41 3	.35	22.10	Co:	367	0.85	17.	٩	CLEAR	-/	411.2
_			_									ORANG	É	
	1						-					5.5		
									_				-	
			_											
													-	
										+			-	
	PACITY (Gallor NSIDE DIA. CA				5" = 0.06	5; 2" = 0.10 1/4" = 0.002		3" = 0,37; 5/16" = 0.0	4" = 0.65; 004: 3/8" = (5" = 1.0 0.006:	2: 6" 1/2" =	= 1.47; 0.010;	12" = 5/8" =	
PURGING	EQUIPMENT O	ODES:	B = Bailer;	BP = Bladder Pum	p; E:	SP = Electric	Subm	ersible Pur		eristaltic		and a reason of the second		pecify)
SAMOLED	BY (PRINT) / A	FEILATION		SAMPLER(S) SIG		LING DA	JA	1						_
J. K	7 7 7	11	intec	SAMPLER(S) SIG		Th	1		SAMPLING INITIATED A	T: 112	5	SAMPLIN ENDED A		130
		121			2	۲.) ۲.)	-		FILTERED: Y		>	FILTER S	IZE:	<u> μ</u> m
			MP Y (1	MATERIAL CODE	JBING	Y ON Pre	enlace		DUPLICATE:			N		
SAM						ESERVATIO			INTEND		1	IPLING	SAM	PLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	Т	OTAL VOL D IN FIELD (r	T	FINAL	ANALYSIS A METHO	ND/OR	EQU	PMENT ODE	FL(OW RATE per minute)
EKMW-11	1	CHEMETS	25 mL	NA		-		3.35	S2O8 (Pers	ulfate)	F	PP	د	100
EKMW-11	3	AG	40 mL	H2S04		-		ι2	тос		F	NPP		
EKMW-11	1	PE	250 mL	NONE		-		3.35	SO42-		ļ	APP .		
EKMW-11	1	PE	250 mL	HNO3		~		42	Sulfur, T	otal	/	\PP		
EKMW-11	1	PE	250 mL	HNO3	-	-	_	42	Fe, Mn		- /	APP		•
REMARKS		ally purges dr ulfate tested i	y. Purge one e n field with CH	quipment volume pr EMETS colorimetric	ior to sau tubes, 2	pling.	1		I,					
MATERIAL	CODES:	AG = Amber	Glass; CG	= Clear Glass; P	E = Poly	ethylene;	J PP =	Polypropyle	ene; S = Silice	one; T	= Teflor	n; O = C)ther (S	Specify)
SAMPLING	GEQUIPMENT			eristaltic Pump; se Flow Peristaltic F	B = Bail			er Pump; od (Tubing	ESP = Electi Gravity Drain);		ersible f Other (S			
)TES: 1.	The above of	lo not cons	stitute all of	the information	required	by Chapte	er 62	-160, F.A	.C.					

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)
SITE NAME:	NAS JAX EK	TAP				TE DCATION:	Jacksonville, F	L			
WELL NO	EKMW-12			SAMPLE	ID: EKM	N-12			DATE 12	103/2019	
					PURC	SING DA	TA				
	ry (monoa).	2 TUBIN DIAM	ETER (inches)	: 1/4 DEP1	L SCREEN TH: 19 fe	et to 23	feet TO WA		32 OF	IRGE PUMP T 8 BAILER:	PP PP
	LUME PURGE it if applicable)	1 WELL VO		TAL WELL DEPT	TH - STA	TIC DEPTH	TO WATER)	X WELL CAPA	CITY		
EQUIPME	NT VOLUME P	URGE: 1 EC	= (UIPMENT VO	L. = PUMP VOLU	feet – JME + (TUE	BING CAPAC	feet)	X	gailons/fo H) + FLOW C		gallons
(only fill ou	it if applicable)			= — gal	llons + (a.c	oze gall	ons/foot X	30 fee	t) + - 12	2 gallons	= 0.2 gallons
	JMP OR TUBIN WELL (feet):	1G 21		IMP OR TUBING N WELL (feet):	21	PURGIN	IG ED AT: 1150	PURGING ENDED AT	11:00		
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gailons)	PURGE RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or rtS/cm	DISSOLVED OXYGEN (circle units) mg/Dor % saturation	TURBIDI (NTUs	TY COLO	R ORP
1200	0.50	0.50	0.05	8.45	6.11	23.87	2457	0.19	34.5	CEA	2 -28.5
										~/ss	
									_		
			_						_		
											_
-											
	PACITY (Gallor			1" = 0.04; 0.0006; 3/16" =	1 .25" = 0.08				5 " = 1.02; 0.006: 1/2	6 " = 1.47 2 " = 0.010:	12" = 5.88 5/8" = 0.016
PURGING	EQUIPMENT	ODES:	3 = Bailer;	BP = Bladder Pu	imp; E	SP = Electric	Submersible F	ump; PP = i	Peristaltic Pur	np, O = O	ther (Specify)
CAMPI CO	BY (PRINT)	CELLATION	/	SAMPLER(S)	SAMP	LING D	ATA			Ť	
			harstone	SAMPLERIS		A		SAMPLING INITIATED	AT: 12:09	SAMPLIN	
PUMP OR	TUBING	21		TUBING		ي حرا		D-FILTERED:	CND		IZE:μm
	WELL (feet):		VIP Y	MATERIAL CO	TUBING	Y CD(n		tion Equipment T			
						RESERVATIO		INTEN	1	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIN USED		IOTAL VOL D IN FIELD (ANALYSIS . METH	AND/OR E	CODE	FLOW RATE (mL per minute)
EKMW-12	1	CHEMETS	25 mL	NA		-	6.11	S2O8 (Per	sulfate)	APP	6100
EKMW-12	3	AG	40 mL	H2S04		-	42	тос		APP	
EKMW-12	1	PE	250 mL	NONE		-	6.11	SO4 ²		APP	
EKMW-12 EKMW-12	1	PE PE	250 mL 250 mL	HNO3		-	62	Sulfur,		APP	- F
	1		200 ML	HNO3			42	Fe, M	1	APP	
REMARKS	vvcii matorioi	ally purges dr ulfate tested i	✓. Purge one e n field with CH	l quipment volume IEMETS colorime	prior to san tric tubes.	npling.	→ = [3.	.5 ppm]		;	
MATERIAL	CODES:	AG = Amber	Glass; CG	= Clear Glass;	PE = Poly	ethylene;	PP = Polyprop	oylene; S = Silio	cone; T = T	eflon; O = (Other (Specify)
SAMPLING	EQUIPMENT			eristaltic Pump;	B = Bail		Bladder Pump	ESP = Elec	tric Submersi	ble Pump;	
OTES: 1.	The above of			se Flow Peristalti the informatio				ig Gravity Drain); A.C.	O = Othe	er (Specify)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

	NAS JAX EK	TAP				LO	CATION:	ackson	ville, FL					
WELL NO	EKMW-13B			SA	MPLE ID:	EKMV	V-13B				DATE:	2 03/201	٦	
					F	URG	ING DA	ТА						
NELL VO	n (inches).		IETER (inches		DEPTH:	19 fe	NTERVAL et to 23 fe TIC DEPTH T	eet T	STATIC D TO WATE ER) X		Λ ο	PURGE PUMP DR BAILER:	TYPE	PP
	NT VOLUME P It if applicable)	URGE: 1 EC	= (Quipment VC)L. = PUMI		- + (TUB + (0. 04		f TY ms/foot		BING LENGTH) + FLOW	/foot = - CELL VOLUM 132- gallon		gallons
	JMP OR TUBIN WELL (feet):	1G 21		JMP OR TI	UBING		PURGIN	G		PURGING ENDED AT:		TOTAL V	OLUME	
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGEE (gallons)	PURGE RATE	DEP T(WAT (fee	C (sta	pH Indard nits)	TEMP.	(circle µmho	ND. e units) os/cm	DISSOLVED OXYGEN (circle units) mg. or saturation	TURBII (NTL			ORP (mV)
1342	0.50	0.50	0.06	10.0	a) 5.	82	25.67	28	4-2	0.69	8.41	- CLEA	5.1	-24.5
		-		_				-			-			
			_											
				_										
											-			
	-												-	
	ACITY (Gallor ISIDE DIA. CA					" = 0,06	; 2" = 0.16 1/4" = 0.0026		= 0_37: / 16'' = 0_0		5 " = 1,02;		12" =	
	EQUIPMENT (B = Bailer;		dder Pump		SP = Electric 8	-			eristaltic P	ump: O =	Other (\$	= 0.016 Specify)
			112/2010							10.1			Guiden	
200						PANUAI	ING DA							
AMPLER	BY (PRINT) / /	1.2		SAMPLE	ER(S) SIG					SAMPLING		SAMPL		400
<u> </u>	TSIAHIUSA	11								INITIATED A		T ENDED	AT:	400 354 (
MP OR	TSIAHIUSA	1.2	лес	TUBING		B					B	T ENDED	AT:	14-00
JMP OR EPTH IN	TUBING	(2 00 511	лес	TUBING	AL CODE:	B	(S):hA		Filtratio	INITIATED A	- B	T ENDED	AT:	400 354 (
EPTH IN	איינצאל TUBING WELL (feet):	DN: PUI	лес MP Y (TUBING	AL CODE:	BING	(S):hA	Placed)	Filtratio	INITIATED A FILTERED: Y n Equipment Ty DUPLICATE: INTEND	pe:	FILTER	SIZE: _	4-00 3-5-4-(μm
EPTH IN ELD DEC SAMP	TUBING WELL (feet): CONTAMINATIO PLE CONTAINE #	DN: PUI ER SPECIFIC MATERIAL	лес MP Y (AL CODE: TU SAM	BING PLE PRI	(S): 76, 5 Y O(rel ESERVATION OTAL VOL	TA placed)	Filtratio	INITIATED A FILTERED: Y n Equipment Ty DUPLICATE:	ED ND/OR	Filter	SIZE: _	400 354 (
EPTH IN ELD DEC SAMPLE CODE	TUBING WELL (feet): CONTAMINATIO	DN: PUI			AL CODE: TU SAM	BING PLE PRI	(S) Y (rej ESERVATION OTAL VOL D IN FIELD (m	TA placed) N	Filtratio FINAL pH	INITIATED A ILTERED: Y n Equipment Ty DUPLICATE: INTENDE ANALYSIS A	ED ND/OR	FILTER FILTER N SAMPLING EQUIPMENT	SIZE: _	4 -∞ 3 -5-4-(μm IPLE PUMF OW RATE
AMPLE CODE CODE	TUBING WELL (feet): CONTAMINATIO PLE CONTAINE #	DN: PUI ER SPECIFIC MATERIAL CODE	лес MP Y CATION VOLUME	TUBING MATERI N PRESER	ER(S) SIG AL CODE: TU SAM RVATIVE SED	BING PLE PRI	(S): 76, 5 Y O(rel ESERVATION OTAL VOL	placed) N	Filtratio	INITIATED A FILTERED: Y n Equipment Ty DUPLICATE: INTENDI ANALYSIS A METHO	ED ND/OR	FILTER FILTER N SAMPLING EQUIPMENT CODE	SIZE: _	1PLE PUMP OW RATE per minute
UMP OR EPTH IN ELD DEC SAMF AMPLE CODE (MW-13B (MW-13B	TUBING WELL (feet): CONTAMINATIO PLE CONTAINE # CONTAINERS 1	CHEMETS	MP Y CATION VOLUME 25 mL	PRESEF US N/ H25	ER(S) SIG AL CODE: TU SAM RVATIVE SED	BING PLE PRI	(S) Y (rej ESERVATION DTAL VOL D IN FIELD (m	placed)	Filtratio FINAL pH 5.82	INITIATED A' FILTERED: Y n Equipment Ty DUPLICATE: INTENDI ANALYSIS A METHO S2O8 (Pers	ED ND/OR	FILTER FILTER N SAMPLING EQUIPMENT CODE APP	SIZE: _	1PLE PUMP OW RATE per minute
MP OR EPTH IN ELD DEC SAMP MPLE CODE MW-13B MW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3	DN: PUI R SPECIFIC MATERIAL CODE CHEMETS AG	MP Y ATION VOLUME 25 mL 40 mL	PRESEF US N/ H25	R(S) Sig AL CODE: TU SAM RVATIVE EED S04	BING PLE PRI	(S): Y (rei ESERVATION DTAL VOL D IN FIELD (m	placed) N nL)	Filvatio FINAL pH 5.82 42	INITIATED A TLTERED: Y n Equipment Ty DUPLICATE: INTENDI ANALYSIS A METHO S208 (Pers TOC	ED ND/OR D ulfate)	APP ENDED FILTER N SAMPLING EQUIPMENT CODE APP	SIZE: _	14 cc 3 5 4 γ μm iPLE PUMF OW RATE per minute
AMPLE CODE CODE CMW-13B CMW-13B CMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1	DN: PUI ER SPECIFIC MATERIAL CODE CHEMETS AG PE	MP Y ATION VOLUME 25 mL 40 mL	TUBING MATERI N PRESEF US N/ H2S N0 HN	R(S) Sig AL CODE: TU SAM RVATIVE EED S04	BING PLE PRI	(S) Y (rej ESERVATION OTAL VOL D IN FIELD (m	placed) N nL)	Filtratio FINAL pH 5.82 LL 5.81	INITIATED A' FILTERED: Y IN Equipment Ty DUPLICATE: INTENDI ANALYSIS A METHO S208 (Pers TOC S04 ²⁻	ED ND/OR D ulfate)	APP APP	SIZE: _	1PLE PUMP OW RATE per minute
UMP OR EPTH IN IELD DEC	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1 1 1 Well historice	CHEMETS AG PE PE PE Ally purges dr	лбс MP Y CATION VOLUME 25 mL 250 mL 250 mL	TUBING MATERI N PRESEF US N/ H2S N/ H2S N/ H2S N/ H2N H2S	R(S) SiG AL CODE: TU SAM RVATIVE EED A 504 NE 03 003	BING PLE PRI ADDEI	(S): Y (rej Y (rej ESERVATION DTAL VOL D IN FIELD (m - - - - - - - - - - - - -	placed) N	Filtratio FINAL pH 5.82 LL 5.82 LL	INITIATED A' FILTERED: Y n Equipment Ty DUPLICATE: INTENDI ANALYSIS A METHO S2O8 (Pers TOC SO4 ²⁻ Sulfur, To Fe, Mn	ED ND/OR D Ulfate)	APP APP	SIZE: _	IPLE PUMP OW RATE per minute
CMMP OR EPTH IN ELD DEC SAMF AMPLE COODE CMW-13B CMW-13B CMW-13B CMW-13B CMW-13B CMW-13B CMW-13B CMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1 1 1 Well historice	CHEMETS AG PE PE PE Ally purges dr	MP Y ATION VOLUME 25 mL 250 mL 250 mL 250 mL 250 mL 250 mL	TUBING MATERI N PRESEF US N/ H2S N/ H2S N/ H2S N/ H2N H2S	R(S) Sig AL CODE: TU SAM RVATIVE SED S04 INE 03 IO3 IO3	PLE PRI ADDEL	(S) Y (rej SERVATION DTAL VOL DIN FIELD (m - - - - - - - - - - - - -	placed) N nL)	Filtratio FINAL pH 5.82 LL 5.82 LL	INITIATED A' TILTERED: Y INTERED: Y INTENDI ANALYSIS A METHO S208 (Pers TOC S04 ²⁻ Sulfur, To Fe, Mn DUP - C	ED ND/OR D Ulfate)	N SAMPLING EQUIPMENT CODE APP APP APP APP	SIZE: _	IPLE PUMP OW RATE per minute
AMPLE CODE (MW-13B (MW-13B (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1 1 1 1 1 1 1 1 1	CODES:	MP Y ATION VOLUME 25 mL 250 mL 250 mL 250 mL 250 mL 250 mL	TUBING MATERI MATERI N PRESEF US N/ H25 N/ H25 N/ H25 N/ H25 H25 N/ H25 H25 N/ H25 H25 H25 H25 H25 H25 H25 H25 H25 H25	ER(S) SiG NAL CODE: TU SAM RVATIVE SED 304 NE 03 003 Volume price olorimetric f ass; PE ump;	PLE PRI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDE TI ADDE TI ADDEL TI ADDE TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDEL ADDEL TI ADDEL TI ADDEL TI ADDEL TI ADDE	(S): Y (re, ESERVATION DTAL VOL D IN FIELD (m - - - - - - - - - - - - -	placed) N nL) PP = Pc Bladder	Filtratio	INITIATED A' TILTERED: Y INTERED: Y INTENDI ANALYSIS A METHO S208 (Pers TOC S04 ²⁻ Sulfur, To Fe, Mn DUP - C	ED ND/OR D Ulfate)	APP APP APP APP APP APP APP APP APP APP	SIZE: _	IPLE PUM OW RATE per minute

pH: \pm 0.2 units **Temperature**: \pm 0.2 °C **Specific Conductance**: \pm 5% **Dissolved Oxygen**: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity**: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

	NAS JAX EK						TE DCATION:	Jacksonvill	le, FL						
VELL NC	EKMVV-14			SAN	IPLE ID:	EKM	N-14				DATE:	12/0	3/2019		
						PURC	SING DA	TA				1.			
/ELL				14			INTERVAL		ATIC D		NM		E PUMP T		~~
	R (inches):		IETER (inches)				et to 23			n (icci).		OR BA	ILER:		>>
nly fill ou	ut if applicable)		 (10												
	NT VOLUME P	URGE: 1 EC		L. = PUMP	- feet VOLUME	: E + (TUE	SING CAPAC	ITY X	et) X TU	BING LENG		ns/foot W CELL		_	gallons
only fill ou	ut if applicable)				gallon	s+(0		ons/foot X	21	6 fe	et) +	2.132	_ aallons	= 0 /	2 gallons
	UMP OR TUBIN	1G 2	FINAL PL	IMP OR TU	BING	2),	PURGIN	IG		PURGING	i uli	20 1	OTAL VO	LUME	10
EPTH IN	I WELL (feet):			WELL (fei	et):	1.19		1	T	ENDED A		37 F	URGED (gallons): 7.0
TIME	VOLUME	VOLUME		DEPT		pН	TEMP	CONE (circle ur		OXYGEN	TUR	BIDITY	COLC	R	ORP
	PURGED (gallons)	PURGED (gallons)		WATE (feet	- R - ,	andard Inits)	(°C)	μmhos/		(circle units	(1)	TUs)	(descri	be)	(mV)
4 257	0.50	0.50	0.04			٥٦	24.22	<u>or</u> 45/0 3213	-	% saturatio		OR	FOLG		91.5
1434	0.50	1.00			2	.42	22.53	2570		0.24		51C 1.6		-	- 72.1
1121		1			, 0	.10		3.4	-	0. 40	19		clear		,
				-	_						-				
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	BY (PRINT)	PACITY (Gal CODES: FILIATION	./Ft.): 1/8" = 0 B = Bailer;	.0006; 3	der Pump	0014; E	1/4" = 0.002 SP = Electric	26; 5/16 Submersib	5" = 0.0	004; 3/8" =	= 0.006; Peristaltic	1/2" = Pump;	0.010; 0 = 0	5/8'' =	0.016 pecify)
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	BY (PRINT)	PACITY (Gal CODES: FILIATION	./Ft.): 1/8" = 0 B = Bailer;	BP = Blad	1/16" = 0. der Pump R(S/SIG		1/4" = 0.002 SP = Electric	Submersib	5" = 0.0 ble Pun	004; 3/8" =	= 0.006; Peristaltic AT: /4 Y NC	1/2" = Pump;	0.010; 0 = 0 SAMPLIN ENDED A FILTER S	5/8" = Ither (S IG AT: (0.016 specify) 4:55
	BY (PRINT)	PACITY (Gal CODES: FILIATION AZNHA.2 BDX	./Ft.): 1/8" = 0 B = Bailer;	BP = Blad SAMPLE TUBING MATERIA	AL CODE		1/4" = 0.002 SP = Electric	26; 5/16 Submersib	5" = 0.0 ble Pun	004; 3/8" = np; PP = SAMPLINC INITIATED FILTERED:	= 0.006; Peristaltic AT: /4 Y N⊂ Type:	1/2" = Pump;	0.010; O = O SAMPLIN ENDED A	5/8" = Ither (S IG AT: (0.016 specify) 4:55
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CUBING IN CURGING CAMPLED CUMP OR DEPTH IN IELD DEC SAM	NSIDE DIA. CA EQUIPMENT (BY (PRINT) / TUBING WELL (feet): CONTAMINATIO	PACITY (Gal CODES: FILIATION AZA HA.2 DYT ON: PU	/Ft.): 1/8" = 0 B = Bailer; 	BP = Blad SAMPLE TUBING MATERIA N PRESER	VITE" = 0. der Pump R(S)SIG AL CODE TL SAM VATIVE	DO14; AMP Noturn JBING	1/4" = 0.002 SP = Electric SP = C.S Y QI (n ESERVATIO TOTAL VOL	Submersite Submersite Transformersite Transformersite Transformersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submersite Submers	5" = 0.0 ple Pun FIELD- Filtratio	004; 3/8 th p; PP = SAMPLINC INITIATED FILTERED: n Equipment DUPLICAT	e 0.006; Peristaltic AT: /4 Y NC Type: E: DED AND/OR	1/2" = Pump; • 45 >> Y SAN	0.010; 0 = 0 SAMPLIN ENDED A FILTER S	5/8'' = hther (S NG NT: (' IZE: - SAM FLO	0.016 (με ε τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ
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2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units **Temperature:** \pm 0.2 °C **Specific Conductance:** \pm 5% **Dissolved Oxygen:** all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity:** all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР					Jacksonville, FL				
	EKMW-11			SAMPLE					DATE:	12/18/20	19
					PURC	SING DA	TA				
	R (inches): 2		ETER (inches):	74 DEP	L SCREEN TH: 19 fe	INTERVAL et to 23 f	STATIC D feet TO WATE	R (feet): Ч. S	6 0	PURGE PUMP T DR BAILER:	PP PP
(only fill ou	it if applicable)		= (feet –		FO WATER) X feet) X		gallons	/foot =	gallons
	NT VOLUME P It if applicable)	URGE: 1 EQ	UIPMENT VOL			0026 gall					
	JMP OR TUBIN	G	FINAL PUI	- U ga		PURGIN		PURGING)+ 0. ((= 0.2 gallons
	WELL (feet):	21		WELL (feet):	21			ENDED AT:	11:04	PURGED (gallons): 0.25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP, (°C)	COND. (circle units) µmhos/cm or مرجعبه	OXYGEN (circle units) (circle units) (circle units) (circle units) (circle units) (circle units) (circle units)	TURBI (NTL		
11:04	0.25	0.25	0.08	6.15	3.02	22.40	5783	1.40	6.0	16 clea	- 484.5
			_								
			_								
	-			_							
			_								
WELLCA	PACITY (Gallon	Ber Foot):	0.75" = 0.02	1" = 0.04;	1.25 " = 0.0	6; 2 " = 0,1	6; 3 " = 0.37;	4 " = 0.65;	5 " = 1.02:	6" = 1.47;	12" = 5.88
	SIDE DIA. CAI					1/4" = 0.002				1/2" = 0.010;	5/8'' = 0.016
PURGING	EQUIPMENT	ODES:	3 = Bailer;	BP = Bladder P			Submersible Pun	np; PP = P	eristaltic P	² ump; O = C	other (Specify)
SAMPLED	BY (PRINT) / A	FEILIATION		SAMPLER(S)		LING D		1		1	
	Zinckar	,	cosyntec	B	. 7	11/	1	SAMPLING	т: 1127	U SAMPLIN ENDED A	ng at: 11:25
PUMPIOR	TUBING U		- wayne a	TUBING	7	1	FIELD-	FILTERED Y) N	FILTER S	SIZE: 0.45 μm
	WELL (feet):	21	MP Y A	MATERIAL CO		EIS 1		n Equipment Ty		line	
			ĭ	9	TUBING		oplaced)	DUPLICATE:	r		
SAMPLE ID CODE	PLE CONTAINE # CONTAINERS		VOLUME	PRESERVATI	VE 1	RESERVATIO TOTAL VOL D IN FIELD (FINAL	INTEND ANALYSIS A METHC	ND/OR	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA			-	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-11	3	AG	40 mL	H2S04		-		тос		APP	c100
EKMW-11	1	PE	250 mL	NONE		-		SO42-		APP	~ 300
EKMW-11	1	PE	250 mL	HNO3		-	-	Sulfur, T	otal	APP	~ 300
EKMW-11	+2	PE	250 mL	HNO3				Metels Ee, Min	Total	Z APP	~ 300
EKMW-1		сG	40 nL	HCI				VOC	- M	APP	<100
REMARKS	**Cil Instolict			quipment volum EMETS colorim		npling. S	5208: 10	mglL			
MATERIAL	CODES:	AG = Amber	Glass; CG	- Clear Glass;	PE = Poly	ethylene;	PP = Polypropyle	ene; S = Silico	one; T =	Teflon; O = (Other (Specify)
SAMPLING	GEQUIPMENT			eristaltic Pump; se Flow Peristal	B = Bai Itic Pump;		Bladder Pump; Method (Tubing	ESP = Elect Gravity Drain);		rsible Pump; ther (Specify)	
OTES: 1	The above o						ter 62-160, F.A.				

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE DCATION:	Jacksonville, FL				
	EKMW-12			SAMPLE I					DATE:	12/10/2	al s
					PURC	SING DA	TA				
	· · ·	DIANC	ETER (inches): DLUME = (TO	TAL WELL DEPT	SCREEN TH: 19 fe TH – STA	INTERVAL et to 23 f	feet STATIC D TO WATE TO WATER) X	R (feet): 5 · /		JRGE PUMP T R BAILER:	PP
	NT VOLUME PI if applicable)	URGE: 1 EQ	= (UIPMENT VO	L. = PUMP VOLU			「feet) X ITY X TL ons/foot X 3の	IBING LENGTH;		ELL VOLUME	= 0.2 (gallons
	MP OR TUBIN WELL (feet):	G 21		MP OR TUBING	21	DUDCIN		DUBCING	/1:42	TOTAL VO	
TIME	VOLUME PURGED (gallons)	CUMUL, VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP, (°C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) <u>or</u> % saturation	TURBID (NTUs		
11:42	0.25	0.25	0.08	6.51	5.69	22.22	2357	0.62	17.0	dee	r 36.3
TUBING IN PURGING I SAMPLED	EQUIPMENT C BY (PRINT) / A	FFILIATION:	/Ft.): 1/8" = 0 3 = Bailer;	1" = 0.04; .0006; 3/16" = BP = Bladder PL SAMPLER(S) S	= 0.0014; ump; E SAMP	1/4" = 0.002 SP = Electric	26; 5/16" = 0.0 Submersible Pur	004: 3/8" = 0	eristaltic Pu		12" = 5.88 5/8" = 0.016 ther (Specify)
PUMPORT	Zinckgra	f/Ge	syntec	TUBING	- 3	m	EIEL D.	FILTERED:			IZE:0.45 μm
DEPTH IN \		2	۱	MATERIAL CO	DE:	PE,S	Filtratio	n Equipment Ty	pe: 1~-1	ine	μπ
FIELD DEC	ONTAMINATIO	DN: PUN	MP Y	5	TUBING	Y MO	eplaced)	DUPLICATE:	Y	Ð	
SAMPLE ID CODE	LE CONTAINE # CONTAINERS	R SPECIFIC	ATION VOLUME	S PRESERVATIN USED	/E T	RESERVATIO	FINAL	INTENDI ANALYSIS A METHO	ND/OR	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-12	1	CHEMETS	25 mL	NA			-	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-12	3	AG	40 mL	H2S04			-	TOC		APP	L 100
EKMW-12	1	PE	250 mL	NONE		_	-	SO42-		APP	~ 300
EKMW-12	1	PE	250 mL	HNO3		-	_	Sulfur, To	otal	APP	~ 300
EKMW-12	1	PE	250 mL	HNO3		-	-	utals the	Total &	APP	~ 300
EKMW-12		CG	40 mL	Dy of the	-1		_	VOC	Disse.	APP	C100
REMARKS	AACH HISTORICS			quipment volume EMETS colorime	prior to sar		208:0 m	- 10 SS	collec	ted.	
	EQUIPMENT		APP = After Pe RFPP = Rever	= Clear Glass; eristaltic Pump; se Flow Peristalti		vethylene; ler; BP = SM = Straw	PP = Polypropyle Bladder Pump; Method (Tubing ter 62-160, F.A	ene; S = Silico ESP = Electr Gravity Drain);	ne; T = ⁻ ric Submers	Teflon; O = 0	Other (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР					lacksonville, FL				
	EKMW-13B			SAMPL		W-13B			DATE:	12/18/20	19
					PURC	SING DA	ТА			10/10/0	
	R (inches):	DIAM	ETER (inches)	'/4 DE	ELL SCREEN PTH: 19 fe	INTERVAL eet to 23 f	eet TO WATE	ER (feet): 4.	16 0	PURGE PUMP T OR BAILER:	YPE ንዖ
	ULUME PURGE: ut if applicable)	: 1 WELL V(DLUME = (TO = (TAL WELL DE	PTH – STA feet –	TIC DEPTH T	OWATER) X feet) X			s/foot =	gallons
	NT VOLUME P	URGE: 1 EQ		L. = PUMP VO		BING CAPACI				CELL VOLUME	gailona
	ut if applicable)			= 0 9	gallons + (o .	0026 gallo	ons/foot X 3	o fee	t) + 0 . 13	3.2 gallons	= 0.21 gallons
	UMP OR TUBIN WELL (feet):	^{IG} 21		MP OR TUBIN I WELL (feet):	G 21	PURGIN INITIATE	G ED AT: /3 · 3			אן דסדאן voi PURGED (נ	LUME gallons): の. こら
TIME	VOLUME PURGED (gallons)	CUMUL, VOLUME PURGED (gailons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µ8700	DISSOLVED OXYGEN (circle units) mgA_or % saturation	TURBI (NTU		
13:39	0.25	0.25	0.08	5.68	5.71	23.45	3010	0.68	26.	8 dea	\$ 38.0
										1	
									-		
	-								-		
	-										
WELL CA	PACITY (Gallor	s Per Foot):	0.75" = 0.02:	1" = 0.04;	1.25" = 0.0	6; 2 " = 0,1	6; 3 " = 0.37;	4" = 0.65;	5 " = 1.02	; 6 " = 1.47;	12" = 5.88
	NSIDE DÌA. CA				" = 0.0014;	1/4" = 0.002	6; 5/16'' = 0.	.004; 3/8" =		1/2" = 0.010;	5/8'' = 0.016
PURGING	EQUIPMENT	CODES:	3 = Bailer;	BP = Bladder			Submersible Pu	mp; PP = 1	Peristaltic F	oump; O = C	ther (Specify)
	BY (PRINT) / A				SAMP	LING DA					
-		,			J SIGNATUR	711	1_	SAMPLING INITIATED	AT: 13:4	15 SAMPLIN	
PUMP OF	- Zinckgr TUBING		posyntec	TUBING	\sim	800	FIELD	-FILTERED:			IZE: 0.45 um
DEPTH IN	WELL (feet):	21		MATERIAL	CODE:	PE,S	Filtrati	on Equipment T	ype: .n-	line	
FIELD DE	CONTAMINATI	ON: PUI	MP Y		TUBING	Y NG	placed)	DUPLICATE	\mathcal{O}) N	
	PLE CONTAIN		ATION			RESERVATIO	N			SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVA USED		TOTAL VOL D IN FIELD (I	FINAL mL) pH	ANALYSIS / METH		EQUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-13B	1	CHEMETS	25 mL	NA			<u></u>	S2O8 (Per	sulfate)	APP	~ 300
EKMW-13B	3	CG	40 mL	HCI			-	VOC	5	APP	< 100
EKMW-13B	3	AG	40 mL	H2S04				TOC		APP	<10D
EKMW-13B	1	PE	250 mL	NONE				SO4 ²		APP	~ 300
EKMW-13B	@ \$2	PE	250 mL	HNO3				Metals (7	n, Sulfur	Dissinge()	~ 3.00
EKMW-13B	1	PE	2590 mL	B NONE	HNOS			(87) ID8			~ 300
REMARK	wwent matorica	ally purges dr	y. Purge one e	quipment volu IEMETS colori	ne prior to sa		208:4.	2 mg/L	(orange	. color - 1	ess pink)
MATERIA	L CODES:	AG = Amber	Glass; CG	= Clear Glass;	PE = Poly	/ethylene;	PP = Polypropy			- Teflon: 0 = 0	Cher (Specify)
	G EQUIPMENT	CODES:	APP = After P	eristaltic Pump se Flow Perist	; B = Ba	iler; BP =	Bladder Pump; Method (Tubing	ESP = Elec	tric Subme	ersible Pump; other (Specify)	
OTES: 1	. The above						er 62-160, F.A				

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР					lacksonville, FL				
WELL NO	EKMW-14			SAMPLE ID	: EKM	W-14			DATE:	12/18/20	19
					PURC	SING DA	ТА			110/00	
WELL VO	R (inches): 2 LUME PURGE: ut if applicable)	TUBIN DIAMI 1 WELL VC	ETER (inches)	1/4 DEPTI	SCREEN 1: 19 fe	INTERVAL et to 23 f	eet TO WATE	R (feet): 3. WELL CAPACI	15 0	URGE PUMP T R BAILER:	PP
	INT VOLUME P ut if applicable)	URGE: 1 EQ	UIPMENT VO	l. = pump volui	ME + (TUB		τγ χ τι	JBING LENGTH)	+ FLOW C	CELL VOLUME	
		- AD	1		ons + (0.	0026 gallo			+ 6.13		= 0.21 gallons
DEPTH IN	UMP OR TUBIN WELL (feet):	G1921		MP OR TUBING WELL (feet):	19	PURGIN	IG ED AT: 14:29	PURGING ENDED AT:	14:34	PURGED (g	IUME Jallons): 0.25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or w87cm	DISSOLVED OXYGEN (circle units) OP or % saturation	TURBID (NTUs		
14:34	0.25	0.25	0.05	5.81	6.07	22.41	3067	1.16	5.0	17 clean	40.9
				_	_						
			_								
	J										
TUBING I	PACITY (Gallor NSIDE DIA. CA EQUIPMENT (PACITY (Gal.				1/4" = 0.002		004; 3/8'' = 0		/ 2'' = 0.010;	12 " = 5.88 5/8 " = 0.016
FUNCING	EQUIFINIENT	,0023. 1	b – Dallel,			LING DA		np, PP = P	eristaltic Pu	/mp, 0 = 0	ther (Specify)
SAMPLED	BY (PRINT) / A	FFILIATION:		SAMPLER(S) SI				SAMPLING		SAMPLIN	
Bina	. Zinckar	af / 6.	eosynte	B		zus		INITIATED A	r: 14: 4	D ENDED A	T: 14:55
PUMP OR	TUBING WELL (feet):	19		TUBING MATERIAL COL		PE,S		FILTERED			IZE: 0.45µm
							placed)	DUPLICATE:	pe: .n-((N)	
	PLE CONTAINE		C			RESERVATIO		INTENDE	1	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE		MATERIAL CODE		PRESERVATIV	E 1	TOTAL VOL	FINAL	ANALYSIS A	ND/OR	EQUIPMENT	FLOW RATE (mL per minute)
EKMW-14	1	CHEMETS	25 mL	NA			_	S2O8 (Pers	ulfate)	APP	~300
EKMW-14	3	AG	40 mL	H2S04				тос		APP	L100
EKMW-14	1	PE	250 mL	NONE				SO42-		APP	~ 300
EKMW-14	1	PE	250 mL	HNO3		_		Sulfur, To	otal .	APP	~ 300
EKMW-14	1	PE	250 mL	HNO3		-		Metalsentin	tal Totol Dissu	Werpp	~ 300
Examin-14	3	CG	YOAL	HCI			-	Joes	- Grap	APP	2100
REMARKS	Well historica			quipment volume EMETS colorimeti		mpling. S	208:0	mg/L			
MATERIA	CODES	AG = Amber	Glass; CG	= Clear Glass;	PE = Poly	ethylene;	PP = Polypropyl	ene; S = Silico	ne; T=	Teflon; O = C	Other (Specify)
	G EQUIPMENT	CODES:	APP = After P	eristaltic Pump; se Flow Peristaltic	B = Bai	ler; BP =	Bladder Pump; Method (Tubing	ESP = Electr	ic Submers		(
OTES: 1.	The above of	do not cons	titute all of	the information	require	d by Chapt	er 62-160. F.A	.C.			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP			SI'	TE CATION: `	Jacksonville, FL				
WELL NO	EKMW-11			SAMPLE	ID: EKMV				DATE:	17/2	0
·				+	PURC	SING DA	TA			111-	<u> </u>
WELL VO	r t (miondo).	2 TUBII DIAM : 1 WELL V	ETER (inches): DLUME = (TOT	DEP	L SCREEN	INTERVAL et to 23 f	STATIC D TO WATE TO WATER) X	R (feet): N WELL CAPAC	NO	URGE PUMP T DR BAILER:	YPE P
EQUIPME (only fill ou	INT VOLUME P ut if applicable)	URGE: 1 EC	= (QUIPMENT VOL	., = PUMP VOL				JBING LENGTH		foot = CELL VOLUME 33 gallons	gallons = 0:21 gallons
	UMP OR TUBIN WELL (feet):			AP OR TUBING WELL (feet):	21		IG ED AT: 355	PURGING ENDED AT:	ILUC	TOTAL VO PURGED (LUME gallons): 0.3
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gailons)	PURGE RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^o C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) (mg/L/or % saturation	TURBIE (NTU		
MIU	0.25	0.35	0:02	NU	5,22	23.82	10690	3.23	11.1	9 C10	2 332
				ï							
								2			-
			-								
TUBING IN	PACITY (Gallor SIDE DIA. CA	PACITY (Gal	/Ft.): 1/8" = 0.0	1 " = 0.04; 0006; 3/16 " BP = Bladder P	= 0.0014;	1/4" = 0.002	6; 3" = 0.37; 6; 5/16" = 0.1 Submersible Pur	004; 3/8" = (/2" = 0.010;	12" = 5.88 5/8" = 0.016 other (Specify)
					SAMP	LING DA			onotanio i c	-	(opeoly)
A	BY (PRINT) / A	10	scinter			(S)		SAMPLING INITIATED A			
	WELL (feet):			MATERIAL CO		2	Filtratio	n Equipment Ty	/pe:		and the pill
	CONTAMINATIO				TUBING	<u> </u>	eplaced)	DUPLICATE	: Y	N	
SAMPLE ID CODE	PLE CONTAINE # CONTAINERS	ER SPECIFIC MATERIAL CODE	VOLUME	PRESERVATI	VE T	ESERVATIO OTAL VOL D IN FIELD (r	FINAL	INTEND ANALYSIS A METHO	ND/OR	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA	-		5.22	S2O8 (Pers	sulfate)	APP	NUU
EKMW-11	3	AG	40 mL	H2S04			62	тос		APP	
EKMW-11	1	PE	250 mL	NONE			5.2.7	SO42-		APP	
EKMW-11	1	PE	250 mL	HNO3	_		12	Sulfur, T	otal	APP	
EKMW-11	13	PE	250 mL	HNO3			22.	Fe, Mn		APP	
REMARKS	Well historica	ally purges dr	UDMU y. Purge one eq	HC 1 uipment volume	e prior to sam	npling.	10	Vages tot	SUIVE	APP	4
MATERIAL	Sodium pers	ulfate tested i AG = Amber CODES:	n field with CHE	METS colorime Clear Glass; ristaltic Pump;	PE = Polye	ethylene; er; BP =	PP = Polypropyle Bladder Pump; Method (Tubing	ESP = Elect	one; T = ` ric Submers	Teflon; O = 0	Other (Specify)
OTES: 1.	The above of						er 62-160, F.A.			(

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ГАР			SI LC	TE J CATION: J	lacksonville, FL				
	EKMW-12			SAMPLE					DATE:	11-1-	
						SING DA	ТА			4400	
WELL		TUBIN			L SCREEN		STATIC			URGE PUMP TY	
DIAMETER		DIAME	TER (inches):	DEF		et to 23 f		ER (feet): NELL CAPACI		R BAILER:	PP
	if applicable)	1 WELL VO								-	- Hana
EQUIPMEN		JRGE: 1 EQU	= (JIPMENT VOL	= PUMP VOL	feet – UME + (TUE	ING CAPACI	feet) X TY X T	UBING LENGTH)	gallons/f + FLOW C		gallons
(only fill out	if applicable)			= () g	allons + (🜔	UU> gallo	ons/foot X	30 feet)	+ 0, 13	allons	
INITIAL PU	MP OR TUBIN		FINAL PUN	IP OR TUBING	3	PURGIN	IG N O I	PURGING		TOTAL VOL	UME
DEPTH IN	WELL (feet):	21	DEPTH IN	WELL (feet):	a		ED AT: YUN	DISSOLVED	145	PURGED (g	allons): U . 5
ТІМЕ	VOLUME	CUMUL. VOLUME	PURGE	DEPTH TO	pH (standard	TEMP.	COND. (circle units)	OXYGEN (cirele units)	TURBID		
TIME	PURGED (gallons)	PURGED (gallons)	RATE (gpm)	WATER (feet)	units)	(°C)	μmhos/cm or (S/cm)	mg/l) or % saturation	(NTU:	s) (descrit	e) (mV)
11107.	0.25	0.35	OUR	NM	5.70	21:24	3274	6.83	32.	1 0100	er 10.4
1970	Ulas	0.00	1000	10,01	5120		-1911	0.000		- Ciec	
						2					
				1							
						2					
			_								2
WELL CAF	PACITY (Gallon	s Per Foot):	0.75" = 0.02;	1" = 0.04;	1.25 " = 0.0	6; 2'' = 0.1	6; 3'' = 0.37;		5" = 1.02;		12" = 5,88
	ISIDE DIA. CA				= 0.0014;	1/4" = 0.002			0.006; 1 eristaltic Pu	//2" = 0.010;	5/8" = 0.016 ther (Specify)
PURGING	EQUIPMENT O	ODES: E	l = Bailer;	BP = Bladder I			Submersible Pu	ump, FF-F		ump, 0 -0	
SAMPLED	BY (PRINT) / A	FFILIATION:	5A	SAMPLER(S)				SAMPLING		SAMPLIN	IG
4-	Johns	on/6e	counter	U	n	<u> </u>	1	INITIATED A			NT: 1510
PUMP OR DEPTH IN	TUBING WELL (feet):	10	12	TUBING MATERIAL C	ODE:	ZES	FIELD	D-FILTERED	npe:	FILTERS	IZE: 0/15 µm
FIELD DEC	CONTAMINATIO	ON: PUN	AP Y (N	3	TUBING	(r	eplaced)	DUPLICATE:	Y	(°N)	
SAM		ER SPECIFIC	ATION			RESERVATIO		INTEND ANALYSIS A		SAMPLING	SAMPLE PUMP FLOW RATE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVAT USED		TOTAL VOL ED IN FIELD (mL) pH	METHO		CODE	(mL per minute)
EKMW-12	1	CHEMETS	25 mL	NA			5,30	S2O8 (Pers	sulfate)	APP	NOU
EKMW-12	3	AG	40 mL	H2S04			23	TOC		APP	
EKMW-12	1	PE	250 mL	NONE			5.30	SO42-		APP	
EKMW-12	1	PE	250 mL	HNO3			22	Sulfur, T		APP	
EKMW-12	2	PE	250 mL	HNO3			1		Aloschie	APP	
EXMINI	9	CB	Himi	HC)			V	- VOCS		V.	V
REMARKS	11010110		Purge one ed n field with CHI				mal	USILE	SD .		
MATERIAI		AG = Amber		- Clear Glass;		yethylene;	PP = Polyprop	ylene; S = Silic	one; T =	Teflon; O = 0	Other (Specify)
		CODES:	APP = After Pe	ristaltic Pump	B = Ba	iler; BP =	Bladder Pump;	ESP = Elect		rsible Pump;	
NOTES: 1.	The above		RFPP = Revers				Method (Tubin) ter 62-160, F.	g Gravity Drain); A.C.	U = 0t	her (Specify)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

	: EKMW-13	в		SAMPLE	ID: EKM	OCATION: " W-13B			DATE:	161		
						GING DA	ТЛ		DATE:	180	30	
WELL			BING	WEL		INTERVAL		DEPTH			TICE	
DIAMETER	R (inches):	2 DIA	METER (inche		THE AD A				M OR	RGE PUMP BAILER:	TYPE	P
(only fill out	t if applicable	E: TWELL)	VOLUME = (1	TOTAL WELL DEP	TH - STA	TIC DEPTH T	O WATER)	WELL CAPACI	TY			/ <u>/</u>
EQUIPMEN	NT VOLUME	PURGE: 1		OL. = PUMP VOLI	feet -		feet)	x	gallons/foo	1 =		gallons
(only fill out	t if applicable)						TUBING LENGTH)				
INITIAL PU	MP OR TUB	ING	EINAL	PUMP OR TUBING		, Sorgallo		30 feet)	+ 6133	gallon	is = C	gallons
DEPTH IN	WELL (feet):	16	DEPTH	IN WELL (feet):	21	PURGIN	G D AT: 1351	PURGING ENDED AT:	125/10	TOTAL V	OLUME	03
	VOLUME	CUMU		DEPTH	pН		COND.	DISSOLVED		TOKGED	(gailon	s). Or (J
TIME	PURGED	VOLUN PURGE			(standard	TEMP. (°C)	(circle units) µmhos/cm	OXYGEN (circle units)	TURBIDIT			ORP
_	(gallons)	(gallons	s) (gpm		units)		or µS/cm	% saturation	(NTUs)	(deso	ribe)	(mV)
1306	0,75	0.25	5.00	3 NM	4.74	01.93	3073	5.40	51.3	(NA	On al	:00
				1			00.0	-SI-IO	515	- Le	ar	138.0
										-		_
										-		
		2										
											-	
											-	
					2							*
NELL 0101											-	
VELL CAPA	ACITY (Gallo	ns Per Foot): PACITY (Ga	0.75" = 0.02	1" = 0.04; 1 0.0006; 3/16" =	.25" = 0.06	2" = 0.16;	3 " = 0.37;	4" = 0.65; 5		i" = 1.47;	12" =	5.88
UBING INS	ACITY (Gallo BIDE DIA. CA	PACITY (Ga	0.75" = 0.02 il./Ft.): 1/8" = B = Bailer;	1" = 0.04; 1 0.0006; 3/16" = BP = Bladder Pur	0.0014;	1/4" = 0.0026;	5/16" = 0	.004; 3/8" = 0.0	06; 1/2"	= 0.010;	5/8" =	0.016
UBING INS	QUIPMENT	PACITY (Ga	<u>II/FL): 1/8" =</u> B = Bailer;	0.0006; 3/16" = BP = Bladder Pur	0.0014; mp; ES	1/4" = 0.0026 P = Electric S	5/16" = 0 ubmersible Pu	.004; 3/8" = 0.0		= 0.010;		0.016
OURGING E	QUIPMENT	PACITY (Ga CODES:	II./Ft.): 1/8" = B = Bailer; I:	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI	0.0014; mp; ES	1/4" = 0.0026 P = Electric S	5/16" = 0 ubmersible Pu	.004; 3/8" = 0.0 mp; PP = Per	006; 1/2" istaltic Pump;	= 0.010; O = 0	5/8'' = Other (S	0.016
		PACITY (Ga CODES:	<u>II/FL): 1/8" =</u> B = Bailer;	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI tec /	0.0014; mp; ES	1/4" = 0.0026 P = Electric S	5/16" = 0 ubmersible Pu TA	004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT:	006; 1/2" istaltic Pump;	= 0.010;	5/8'' = Other (S	0.016
		PACITY (Ga CODES:	II./Ft.): 1/8" = B = Bailer; I:	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI	0.0014; mp; ES SAMPL IGNATURE	1/4" = 0.0026 P = Electric S	5/16" = 0 ubmersible Pu TA FIELD	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: (Y)	1/2" istaltic Pump;	= 0.010; 0 = 0 SAMPLI	5/8" = Other (S NG AT:	0.016 Specify)
			$\frac{11/FL}{B} = Bailer,$ $\frac{11}{C}$	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD	0.0014; mp; ES SAMPL IGNATURE	1/4" = 0.0026 P = Electric S	5/16" = 0 ubmersible Pu TA FIELD Filtratic	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: on Equipment Type	1/2" istaltic Pump; 1310 N	= 0.010; 0 = 0 SAMPLI ENDED FILTER \$	5/8" = Other (S NG AT:	0.016 Specify)
AMPLED B AMPLED B A C COMP OR TL EPTH IN W IELD DECO SAMPLE	Y (PRINT) //		IL/FL): 1/8" = B = Bailer, I: CCSSS MP Y (0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI tec TUBING MATERIAL COD	0.0014; mp; ES SAMPL GNATURE DE: TUBING	$\frac{1}{4} = 0.0026$ $\frac{1}{8}P = E ectric S$ $\frac{1}{5}NG DA^{-1}$ $\frac{1}{5}$	5/16" = 0 ubmersible Pu TA FIELD Filtratic	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: on Equipment Type DUPLICATE:	006; 1/2" : istaltic Pump; i310 N 2: (i)	SAMPLII SAMPLII ENDED FILTER S	5/8" = Other (S NG AT:) SIZE: ()	0.016 Specify)
A SAMPLED B SAMPLED B SAMPLED B SAMPLED B SAMPLE SAMPLE	IDE DIA. CA QUIPMENT (VY (PRINT) // UBING /ELL (feet): DNTAMINATIONE E CONTAINE #	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL	IL/FL): 1/8" = B = Bailer, I: CCSSS MP Y (0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD SA PRESERVATIVE	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S): P = S Y Nuepl SERVATION DTAL VOL	5/16" = 0 ubmersible Pu TA FIELD Filtratio laced)	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: On Equipment Type DUPLICATE: INTENDED ANALYSIS AND	1/2": istaltic Pump, 1/310 N SA D/OR EQL	SAMPLII SAMPLII ENDED FILTER N MPLING JIPMENT	5/8" = Other (S NG AT:) SIZE: SIZE: SAMI FLC	230 ΔΔ μm PLE PUMP DW RATE
CUMPORTU COMPORTU EPTHINW IELD DECO SAMPLE	IDE DIA. CA QUIPMENT (PRINT) (PRINT) (PRINT) (PRINT) UBING (ELL (feet): DNTAMINATION E CONTAINE	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE	IL/FL): 1/8" = B = Bailer, I: CATION VOLUME	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD MATERIAL COD SA PRESERVATIVE USED	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S) Y Y Nuepl SERVATION	5/16" = 0. ubmersible Pu TA FIELD Filtratio faced) FINAL pH	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: On Equipment Type DUPLICATE: INTENDED ANALYSIS AND METHOD	1/2": istaltic Pump; istaltic Pump; N N S N S S S S S All EQL C	SAMPLII ENDED FILTER S N MPLING JIPMENT CODE	5/8" = Other (S NG AT:) SIZE: SIZE: SAMI FLC	0.016 Specify)
AMPLED B AMPLED B AMPLED B AMPLED B COMP OR TL DEPTH IN W IELD DECO SAMPLE CODE C (MW-13B	AUDITAL CALL	AFFILIATION CODES: AFFILIATION ON: PU ER SPECIFIC MATERIAL CHEMETS	IL/FL): 1/8" = B = Bailer; I: OLCS: MP YOLUME 25 mL	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD N SA PRESERVATIVE USED NA	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S): P = S Y Nuepl SERVATION DTAL VOL	5/16" = 0 ubmersible Pu TA FIELD Filtratio laced)	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT; -FILTERED: on Equipment Type DUPLICATE: INTENDED ANALYSIS AND METHOD S208 (Persulf	1/2": istaltic Pump; istaltic Pump; istaltic Pump; N SAL SAL SAL SAL SAL SAL SAL SAL	SAMPLII SAMPLII ENDED FILTER \$ N MPLING JIPMENT CODE APP	5/8" = Other (S NG AT: SIZE: SIZE: (mL ;	230 ΔΔ μm PLE PUMP DW RATE
AMPLED B AMPLED B AMPLED B AMPLED B AMPLED DECO SAMPLI AMPLE CODE C (MW-13B (MW-13B)	IDE DIA. CA QUIPMENT (PRINT) // OVCCP UBING /ELL (feet): DNTAMINATIONE E CONTAINERS 1	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE CHEMETS CG	IL/FL): 1/8" = B = Bailer; I: I:	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD PRESERVATIVE USED NA HCI	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S): P = S Y Nuepl SERVATION DTAL VOL	5/16" = 0 ubmersible Pu TA FIELD Filtratic laced) FINAL pH	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: OD Equipment Type DUPLICATE: NALYSIS AND METHOD S2O8 (Persulf VOCs	1/2": istaltic Pump; istaltic Pump; N SAI D/OR EQL (ate)	SAMPLI SAMPLI ENDED FILTER N MPLING JIPMENT CODE APP	5/8" = Other (S NG AT: SIZE: SIZE: (mL ;	0.016 Specify)
A SAMPLED B COMPORTLO COMPORTLO DEPTHIN W IELD DECO SAMPLE	A CONTAINERS	AFFILIATION ON: PU R SPECIFIC CHEMETS CG AG	IL/FL): 1/8" = B = Bailer, I: I: I: I: I: I: I: I: I: I:	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD MATERIAL COD PRESERVATIVE USED NA HCI H2S04	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S): P = S Y Nuepl SERVATION DTAL VOL	5/16" = 0 ubmersible Pu TA FIELD Filtratio aced) FINAL pH 4.74 U	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: FILTERED: Son Equipment Type DUPLICATE: NTENDED: ANALYSIS AND METHOD S208 (Persulf VOCs TOC	1/2" : istaltic Pump; istaltic Pump; N SAI D/OR SAI EQL (iate)	SAMPLII ENDED FILTER S N MPLING JIPMENT CODE APP APP	5/8" = Other (S NG AT: SIZE: SIZE: (mL ;	0.016 Specify)
AMPLED B AMPLED B AMPLED B AMPLED B AMPLE CODE C CODE C C C C C C C C C C C C C C C C C C C	SIDE DIA. CA QUIPMENT (PY (PRINT) // DUBING /ELL (feet): DNTAMINATION E CONTAINERS 1 3 3	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE CHEMETS CG	IL/FL): 1/8" = B = Bailer; I: I:	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI LCC TUBING MATERIAL COD NA PRESERVATIVE USED NA HCI H2S04 NONE	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S): P = S Y Nuepl SERVATION DTAL VOL	5/16" = 0. ubmersible Pu TA FIELD Filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filt	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: on Equipment Type DUPLICATE: INTENDED ANALYSIS AND METHOD S2O8 (Persulf VOCs TOC SO42-	1/2": istaltic Pump; istaltic Pump; N SAI D/OR EQL (1 iate)	SAMPLII ENDED FILTER S N MPLING JIPMENT CODE APP APP APP	5/8" = Other (S NG AT: SIZE: SIZE: (mL ;	PLE PUMP DW RATE per minute)
AMPLED B AMPLED B AMPLED B AMPLED DECO SAMPLE CODE C (MW-13B (MW-13B (MW-13B	IDE DIA. CA QUIPMENT (PY (PRINT) // DUBING /ELL (feet): DNTAMINATION E CONTAINERS 1 3 3 1	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE	AL/FL): 1/8" = B = Bailer, B = Bailer, B = Bailer, CATION VOLUME 25 mL 40 mL 40 mL 250 mL	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD MATERIAL COD PRESERVATIVE USED NA HCI H2S04	0.0014; mp; ES SAMPL GNATURE GNATURE TUBING MPLE PRE TOBING	1/4" = 0.0026 P = Electric S ING DA (S): P = S Y Nuepl SERVATION DTAL VOL	5/16" = 0 ubmersible Pu TA FIELD Filtratio aced) FINAL pH 4.74 U	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: FILTERED: Son Equipment Type DUPLICATE: NTENDED: ANALYSIS AND METHOD S208 (Persulf VOCs TOC	1/2": istaltic Pump; istaltic Pump; N SAI D/OR EQL (1 iate)	SAMPLII ENDED FILTER S N MPLING JIPMENT CODE APP APP	5/8" = Other (S NG AT: SIZE: SIZE: (mL ;	0.016 Specify)
AMPLED B AMPLED B AMPLED B AMPLED B AMPLED DECO SAMPLI IELD DECO SAMPLI AMPLE CODE C (MW-13B (MW-13B (MW-13B (MW-13B (MW-13B) (MW-13B)	SIDE DIA. CA QUIPMENT (PY (PRINT) // DUBING VELL (feet): DNTAMINATION E CONTAINERS 1 3 3 1 3 3 Well historica	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE	IL/FL): 1/8" = B = Bailer; B B CATION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD MATERIAL COD NA PRESERVATIVE USED NA HCI H2S04 NONE HNO3	0.0014; mp; ES SAMPL GNATURE MPLE PRE MPLE PRE TOBING MPLE PRE	1/4" = 0.0026 P = Electric S ING DA (S): Y Y Y Y ESERVATION DTAL VOL IN FIELD (mL	5/16" = 0. ubmersible Pu TA FIELD Filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filtration filt	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: DUPLICATE: DUPLICATE: NETHODE ANALYSIS AND S208 (Persulf VOCs TOC S042-	006; 1/2" : istaltic Pump; i31() N SAL D/OR SAL EQL (rate)	0.010; 0 = 0 SAMPLII ENDED FILTER \$ N MPLING JIPMENT CODE APP APP APP APP APP	5/8" = Other (S NG AT:) SIZE: (mL ;	230 PLE PUMP DW RATE per minute) 107
AMPLED B AMPLED B AMPLED B AMPLED B AMPLED DECO SAMPLE SAMPLE CODE C CMW-13B CMW-13B CMW-13B CMW-13B CMW-13B	SIDE DIA. CA QUIPMENT (PY (PRINT) // DUBING VELL (feet): DNTAMINATION E CONTAINERS 1 3 3 1 3 3 Well historica	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE	IL/FL): 1/8" = B = Bailer; B B CATION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI LCC TUBING MATERIAL COD NA PRESERVATIVE USED NA HCI H2S04 NONE	0.0014; mp; ES SAMPL GNATURE MPLE PRE MPLE PRE TOBING MPLE PRE	1/4" = 0.0026; P = Electric S ING DA (S); P = S Y (V)(ep) SERVATION DTAL VOL IN FIELD (mL	5/16" = 0. ubmersible Pu TA FIELD Filtratic filtratic filtratic filtratic filtratic filtratic filtratic	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: DUPLICATE: DUPLICATE: NALYSIS ANL METHOD S2O8 (Persulf VOCs TOC SO42-	1/2": istaltic Pump; istaltic Pump; N SAI SAI SAI EQL C iate) e, Mn	SAMPLII SAMPLII ENDED FILTER S N MPLING JIPMENT CODE APP APP APP	5/8" = Other (S NG AT:) SIZE: Q SAMI FLC (mL ;	230 PLE PUMP DW RATE per minute) 1000
AMPLED B AMPLED B AMPLED B AMPLED B AMPLED DECO SAMPLI IELD DECO SAMPLI AMPLE CODE C (MW-13B (MW-13B (MW-13B (MW-13B (MW-13B) (MW-13B)	SIDE DIA. CA QUIPMENT (PY (PRINT) // DUBING /ELL (feet): DNTAMINATIO E CONTAINERS 1 3 3 1 3 4 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 1 3 3 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AFFILIATION AFFILIATION ON: PU ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE	IL/FL): 1/8" = B = Bailer; B = Bailer; I: CATION VOLUME 25 mL 40 mL 250 mL 250 mL y. Purge one e n field with CH	0.0006; 3/16" = BP = Bladder Pur SAMPLER(S) SI CLCC TUBING MATERIAL COD MATERIAL COD NA PRESERVATIVE USED NA HCI H2S04 NONE HNO3 Quipment volume p EMETS colorimetri	0.0014; mp; ES SAMPL GNATURE MPLE PRE MPLE PRE TOBING MPLE PRE	1/4" = 0.0026 F = Electric S ING DA (S): Y Y Notepl SERVATION DTAL VOL IN FIELD (mL DTAL VOL IN FIELD (mL	5/16" = 0. ubmersible Pu TA FIELD Filtratic filtratic filtratic filtratic filtratic filtratic filtratic	.004; 3/8" = 0.0 mp; PP = Per SAMPLING INITIATED AT: -FILTERED: DUPLICATE: DUPLICATE: DUPLICATE: ANALYSIS AND METHOD S2O8 (Persulf VOCs TOC SO42- Total/Dissolved Fersol	006; 1/2": istaltic Pump; istaltic Pump; N SAI SAI SAI SAI CO/OR EQL (C ate) 	0.010; 0 = 0 SAMPLII ENDED FILTER N MPLING JIPMENT CODE APP APP APP APP APP APP APP APP APP APP	5/8" = Other (S NG AT:) SIZE: Q SAMI FLC (mL ;	PLE PUMP DW RATE poer minute)

PH: \pm 0.2 units **Temperature:** \pm 0.2 °C **Specific Conductance:** \pm 5% **Dissolved Oxygen:** all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) **Turbidity:** all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

WELL NO: EKMW-14 WELL NO: EKMW-14 UBING DATA UAMETER (inches): UMETER (inches):	DATE: 1	18120
WELL TUBING ILL WELL SCREEN INTERVAL STATIC DEPTH		10120
WELL 2 TUBING ILL WELL SCREEN INTERVAL STATIC DEPTH		1.1.6
DIAMETER (inches); DIAMETER (inches); UP DEPTH: 19 feet to 23 feet TO WATER (feet);	PURGE	
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CA		ILER: DY
(only fill out if applicable) = (feet - feet) X	43-0410-80-0420-000	-
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LEN	gallons/foot GTH) + FLOW CELL	VOLUME
= O gallons + (O , CO gallons/foot X 3 O	feet) + (), 133	gallons = 0.21 gallons
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21 FINAL PUMP OR TUBING DEPTH IN WELL (feet): 31 PURGING INITIATED AT: 1210 PURGING INITIATED AT: 1210 PURGING		OTAL VOLUME
CUMUL DEPTH COND DISSOLV	/ED	URGED (gallons): 03
TIME VOLUME VOLUME PURGE TO PH TEMP (circle units) OXYGE PURGED PURGED RATE WATER (standard units) (°C) umhos/cm or contact or contact	its) (NTUs)	COLOR ORP (describe) (mV)
1340 0.35 0.25 0.03 NIN 6027 2370 2773 0.8		unite -33.
	s ozer	to the sol
WELL CAPACITY (Gallons Per Foot); 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65 TUBING INSIDE DIA. CAPACITY (Gal/Ft.); 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8		
	" = 0.006; 1/2" = 0 = Peristaltic Pump;	0.010; 5/8" = 0.016 O = Other (Specify)
SAMPLING DATA	- r chstallo r dhip,	e - Other (apecity)
SAMPLED BY (PRINT) / AFFILIATION: SAMPLER(S) SIGNATURE(S): SAMPLINITIATE		
PUMP OR TUBING DEPTH IN WELL (feet): TUBING MATERIAL CODE: PES Filtration Equipment	(Y) N	FILTER SIZE
FIELD DECONTAMINATION: PUMP Y (N) TUBING Y (R)(replaced) DUPLIC/		N
		PUNG SAMPLE PUMP
SAMPLE # MATERIAL VOLUME PRESERVATIVE TOTAL VOL FINAL ANALYS ID CODE CODE VOLUME PRESERVATIVE ADDED IN FIELD (mL) pH ME	IS AND/OR EQUI	PMENT FLOW RATE DDE (mL per minute)
	Persulfate) A	PP ~ ivo
		PP
		PP
	In the second	PP
KMW-14 PE 250 mL HNO3 Z Fe	MIN COLOSSENS A	PP 4
REMARKS: Well historically purges dry. Purge one equipment volume prior to sampling. Sodium persulfate tested in field with CHEMETS colorimetric tubes.		(r)
	Silicone; T = Teflon	; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = E	lectric Submersible P	ump;
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drail DTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.	n); O = Other (Sp	ecify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP				TE CATION: `	lacksonville, FL				
WELL NO): EKMW-11			SAMPLE I					DATE: I	128/207	20
					PURC	SING DA	ТА				
WELL		TUBI			SCREEN	INTERVAL	STATIC D		PU	RGE PUMP T	YPE
	R (inches): 2	DIAN	ETER (inches)	: '/4 DEPT	'H: 19 fe	et to 23 f	eet TO WATE	R (feet): 4.	82 OF	BAILER:	PP
(only fill of	ut if applicable)			TAL WELL DEPT	H – STA	TIC DEPTH T	O WATER) X	WELL CAPAC	ITY		
EQUIPME	NT VOLUME P	URGE: 1 FO	= (L. = PUMP VOLU	eet		feet) X	JBING LENGTH	gallons/fc	ot =	gallons
(only fill of	ut if applicable)										0.62
	UMP OR TUBIN				ons + (0.	0026 gallo		1)+ 0.13	2 gallons	
	WELL (feet):	21		MP OR TUBING WELL (feet):	21		B AT: 13:13	PURGING ENDED AT:	13:16	PURGED (gallons): 0.25
		CUMUL.		DEPTH	-		COND.	DISSOLVED			
TIME	VOLUME PURGED	VOLUME PURGEE		TO WATER	pH (standard	TEMP. (°C)	(circle units) μmhos/cm	OXYGEN (circle units)	TURBIDI		
	(gallons)	(gallons)	(gpm)	(feet)	units)	(0)	or ustom	% saturation	(NTUs)) (descri	ibe) (mV)
13:16	0.25	0.25	0.08	6.22	2.98	23.33	5851	0.85	9.85	clea	- 442.4
									1		
										- III-	
										-	
	-										
				-							
WELL CA	PACITY (Gallon	s Per Foot):	0.75" = 0.02;	1" = 0.04; 1 .0006; 3/16" =	.25" = 0.06	5; 2" = 0.10	6; 3 " = 0.37; 6; 5/16 " = 0.0		5" = 1.02;		12" = 5.88
	EQUIPMENT O		B = Bailer;	BP = Bladder Pu			Submersible Pur		eristaltic Pun	<u>" = 0.010;</u> np: 0 = 0	5/8" = 0.016
						LING DA					
	BY (PRINT) / A			SAMPLER(S) S	IGNATURE	:(S):	1 /	SAMPLING		SAMPLIN	NG
	Zinckgro	-f /6c	osyntec	B	-	yu,		INITIATED A			AT: 13:40
PUMP OR DEPTH IN	TUBING WELL (feet):	2		TUBING MATERIAL COL	DE: C	PE, IS		FILTERED:			SIZE:0 <u>.45</u> μm
FIELD DEC	CONTAMINATIO	DN: PUI	VIP Y A	Ð	TUBING	Y NO	placed)	DUPLICATE:	tener 10A	N	
SAM	PLE CONTAINE	R SPECIFIC	ATION	s	AMPLE PR	ESERVATIO		INTEND	ED	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIV		OTAL VOL D IN FIELD (r	FINAL pH		ND/OR E	QUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA			<u> </u>	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-11	3	AG	40 mL	H2S04		140 /		тос		APP	2/00
EKMW-11	1	PE	250 mL	NONE				SO42-		APP	~ 300
EKMW-11	1	PE	250 mL	HNO3		ـــــ		Sulfur, To		APP	~ 300
EKMW-11	2× @	PE	250 mL	HNO3				Fe, Mn	(Dissolve	APP	~ 300
EKMWLI		CG	40ml	Hel		_		Voc		APP	<100
REMARKS	V Ven matorice			quipment volume EMETS colorimet		pling.	S	208:45			
MATERIAL	CODES	AG = Amber	Glass; CG	= Clear Glass;	PE = Polye	ethylene:	PP = Polypropyle	ene; S = Silico	ne; T = Te	eflon: O = (Other (Specify)
SAMPLING		CODES:	APP = After Pe	eristaltic Pump;	B = Baile	er; BP =	Bladder Pump;	ESP = Electr		· · · · · · · · · · · · · · · · · · ·	
OTES: 1.	The above o			se Flow Peristaltion		SM = Straw	Method (Tubing	Gravity Drain);		r (Specify)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

WELL NO: EKMW-12 SAMPLE ID: EKMW-12 DATE: 1/20/2020 PURGING DATA WELL DIAMETER (inches): 2 TUBING DIAMETER (inches): 1/4 WELL SCREEN INTERVAL DEPTH: STATIC DEPTH To WATER (feet): DATE: 1/20/2020 WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) STATIC DEPTH TO WATER (feet): DATE: 1/20/2020 EQUIPMENT VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) STATIC DEPTH TO WATER) X WELL CAPACITY MELL CAPACITY EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOLUME = PUNP VOLUME (TUBING CAPACITY X TUBING LENGTH) FLOW CELL VOLUME 0.63 Official state INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 2 1 FINAL PUMP OR TUBING DEPTH IN WELL (feet): 2 1 PURGING INITIATED AT: /3: SS PURGING ENDED AT: /3: SS TOTAL VOLUME PURGED (gallons) 0.25 IMME VOLUME (gallons) CUMUL (gallons) PURGE (gallons) DEPTH RATE (gallons) PH RATE (gallons) TEMP, (feet) COND. COND. DISSOLVED COLOR COLOR COLOR ORP (mV) I/3:58 0.25 0.08 7.97 4.32 24.05 2.986
PURGING DATA WELL DIAMETER (inches): TUBING DIAMETER (inches): TUBING DIAMETER (inches): WELL SCREEN INTERVAL DEPTH: STATIC DEPTH TO WATER (feet): PURGE PUMP TYPE OR BAILER: PURGE OR BAILER: PURGE GUIPMENT VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME 0.63 GUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME 0.63 (only fill out if applicable) = O gallons + (0.002/6 gallons/toot X 30 feet) + 0.132 gallons = 0.2 [gallons INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21 PURGING INITIATED AT: /3:55 PURGING ENDED AT: /3:56 TOTAL VOLUME PURGED (gallons): 0.25 TIME VOLUME PURGED (gallons) PURGE RATE (gpm) DEPTH TO WATER (feet) PH (standard Units) COND. (circle units) WATER DISSO
WELL 2 TUBING DIAMETER (inches): TUBING DIAMETER (inches): WELL SCREEN INTERVAL DEPTH: STATIC DEPTH TO WATER (feet): STATIC DEPTH TO WATER (feet): PURGE PUMP TYPE OR BAILER: PURGE PURGE <th< td=""></th<>
Diameter (incres). Diameter (incres). Product (incres). <thp< td=""></thp<>
(only fill out if applicable) = (feet - feet) X gallons/foot = gallons/foot > 0 6 > > > Gallons/foot X TUBING LENGTH) + FLOW CELL VOLUME O > > O 6 > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > > ><
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME 0.63 (only fill out if applicable) = 0 gallons + (0.002 & gallons/foot X 30 feet) + 6.132 gallons = 0.2 (gallons) gallons = 0.2 (gallons) gallons = 0.2 (gallons) fill out if applicable) = 0 gallons + (0.002 & gallons/foot X 30 feet) + 6.132 gallons = 0.2 (gallons) gallons = 0.2 (gallons) foot X 30 feet) + 6.132 gallons = 0.2 (gallons) foot X 30 feet) + 6.132 gallons = 0.2 (gallons) foot X 30 foot X 30 feet) + 6.132 gallons = 0.2 (gallons) foot X 30 foot X 30 feet) + 6.132 gallons = 0.2 (gallons) foot X 30 foot X 30 feet) + 6.132 gallons = 0.2 (gallons) foot X 30 foot X 30 foot X 55 PURGING foot X 30 foot X 10 foot X
(only fill out if applicable) = 0 gallons + (0.0026 gallons/foot X 30 feet) + 0.132 gallons = 6.2 (gallons = 6
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 21 FINAL PUMP OR TUBING DEPTH IN WELL (feet): 21 PURGING INITIATED AT: /3:55 PURGING ENDED AT: 73:55 TOTAL VOLUME PURGED (gallons): TOTAL VOLUME PURGED (gallons): 0.25 TIME VOLUME PURGED (gallons) CUMUL, VOLUME PURGED (gallons) PURGE RATE (gpm) DEPTH TO WATER (feet) pH (standard units) TEMP, (°C) COND. (circle units) primos/cm DISSOLVED OXYGEN (circle units) primos/cm TURBIDITY (NTUS) COLOR (describe) ORP (mV)
DEPTH IN WELL (feet): Z1 DEPTH IN WELL (feet): Z1 DEPTH IN WELL (feet): Z1 INITIATED AT: 73:50 ENDED AT: 73:50 PURGED (gallons): 0, 25 TIME VOLUME PURGED (gallons) CUMUL, VOLUME (gallons) PURGE RATE (gpm) DEPTH TO WATER (feet) pH (standard units) TEMP, (°C) COND, (circle units) (°C) DISSOLVED OXYGEN (circle units) TURBIDITY (NTUS) COLOR (describe) ORP (mV)
TIME CUMUL. VOLUME PURGED (gallons) CUMUL. VOLUME PURGED (gallons) DEPTH PURGE (gpm) pH TO (standard (feet) pH (standard units) TEMP. (°C) COND. (circle units) (°C) DISSOLVED OXYGEN (circle units) TURBIDITY (Store % saturation COLOR (NUS) ORP (describe) ORP
TIME VOLUME VOLUME FORGE TO (standard units) (circle units) (circle units) (circle units) (circle units) (circle units) (circle units) (the units) (circle units) (the units)
Image: Second
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.016; 5/8" = 0.016;
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify) SAMPLING DATA
SAMPLED BY (PRINT) / AFFILIATION: SAMPLER(S) SIGNATURE(S):
By Zinckyrof / Geosyntic By Zuf INITIATED AT: 14:05 SAMPLING ENDED AT: 14:05
PUMP OR TUBING / TUBING / FIELD-FILTERED: O N FILTER SIZE: O. 45 µm
DEPTH IN WELL (feet): 21 MATERIAL CODE: PE,S Filtration Equipment Type: in - Linc FIELD DECONTAMINATION: PUMP Y Y TUBING Y OUPLICATE: Y N
SAMPLE CONTAINER SPECIFICATION SAMPLE PRESERVATION INTENDED SAMPLING SAMPLE PUM
SAMPLE # MATERIAL VOLUME PRESERVATIVE TOTAL VOL FINAL ANALYSIS AND/OR EQUIPMENT FLOW RATE ID CODE CONTAINERS CODE VOLUME USED ADDED IN FIELD (mL) pH METHOD CODE CODE GODE MILLE MAILE FLOW RATE
EKMW-12 1 CHEMETS 25 mL NA S208 (Persulfate) APP ~ 300
EKMW-12 3 AG 40 mL H2S04 - TOC APP
EKMW-12 1 PE 250 mL NONE - SO42 APP ~ 300
EKMW-12 1 PE 250 mL HN03 - Sulfur, Total APP ~ 3 vo
EKMW-12 21 20 PE 250 mL HNO3 Fe, Mr. (550 VCH) APP ~ 300
KMW-12 3 CG 40 mL HCI - VOCS APP <100
REMARKS: Well historically purges dry. Purge one equipment volume prior to sampling. Sodium persulfate tested in field with CHEMETS colorimetric tubes. Sodium persulfate tested in field with CHEMETS colorimetric tubes.
AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE CATION:	lacksonville, FL				
WELL NO	EKMW-13B			SAMPLE ID	EKM	V-13B			DATE:	128120	20
L					PURC	SING DA	TA				00
WELL		TUBIN			SCREEN	INTERVAL	STATIC D			RGE PUMP T	YPE
	R (inches): 2	DIANC	TER (inches)				eet TO WATE			BAILER:	PP
	ut if applicable)	1 WELL VO		TAL WELL DEPTH		TIC DEPTH I	O WATER) X	WELL CAPACI	ΙY		_
EQUIPME		URGE: 1 EQ	= (JIPMENT VO	fe	et – ME + (TUE	SING CAPACI	feet) X TY X TL	BING LENGTH	gallons/fo + FLOW C		gallons 0.63
	ut if applicable)				•						
		30,		= () gallo MP OR TUBING	ons + (0.	0026 gallo		DURCING	+ 0.13	TOTAL VO	= 0, 21 gallons
DEPTH IN	WELL (feet):	19/2		WELL (feet):	21	INITIATE	ED AT: 14:34	ENDED AT:	14:37	PURGED (gallons): 0.25
	NOLIME	CUMUL.	DUDOT	DEPTH	рН		COND.	DISSOLVED OXYGEN			
TIME	VOLUME PURGED	VOLUME PURGED	PURGE RATE	WATER (standard	TEMP. (°C)	(circle units) µmhos/cm	(circle units)	TURBIDI (NTUs		
	(gallons)	(gallons)	(gpm)	(feet)	units)		or ps7cm	% saturation			
14:37	0.25	0.25	0.08	8.19	4.09	23.62	2992	1.01	24.6	light	ow 235.7
										0	
					_						
					<u> </u>			_			
		2									
					0 4 0						
	NSIDE DIA. CA			1" = 0.04; 1 .0006; 3/16" =		6; 2" = 0,1 1/4" = 0,002			5" = 1.02; .006; 1/	6" = 1.47; 2" = 0.010;	12" = 5.88 5/8" = 0.016
PURGING		ODES: E	I = Bailer;	BP = Bladder Pur	np; E	SP = Electric	Submersible Pur	np; PP = P	eristaltic Pur	mp; O = C	ther (Specify)
		FERMATION				LING DA				1	
	BY (PRINT) / A Zinekaro		systec	SAMPLER(S) SI		E(S): AN	/	SAMPLING INITIATED A	T: 14:49	SAMPLIN ENDED	IG AT: 15:15
PUMP OR		21	- 1	TUBING	0	PEIS	FIELD-	FILTERED: (Y) N	FILTER S	IZE: <u>0.45</u> μm
	WELL (feet):		IP Y ∕t	MATERIAL COL			Filtratic	DUPLICATE:	~	N	
					_	RESERVATIO		INTEND		SAMPLING	SAMPLE PUMP
	# CONTAINERS			PRESERVATIV	= " -		FINAL	ANALYSIS A METHO	ND/OR E	EQUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-13B	1	CHEMETS	25 mL	NA			_	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-13B	3	AG	40 mL	H2S04			-	тос		APP	C/00
EKMW-13B	1	PE	250 mL	NONE			-	SO42-		APP	~ 300
EKMW-13B	1	PE	250 mL	HNO3		_		Sulfur, To	otal	APP	~ 300
EKMW-13B	21 O	PÉ	250 mL	HNO3		-	-	Fe, Mn	(Total Dissolut	APP APP	~ 300
EKMW-1		60	40 mL	HCI		<u> </u>	-	VOC		APP	C100
REMARKS	S: Well historica Sodium pers	ally purges dry ulfate tested in	. Purge one e n field with CH	quipment volume EMETS colorimeti	prior to sar fic tubes.		$S_2O_8 = 2$	ollected.			
MATERIA	L CODES:	AG = Amber	Glass; CG	= Clear Glass;	PE = Poly		PP = Polypropyle		one; T = T	eflon; O = (Other (Specify)
SAMPLIN	G EQUIPMENT			eristaltic Pump; se Flow Peristaltic	B = Bai Pump;		Bladder Pump; Method (Tubing	ESP = Electi Gravity Drain);		ible Pump; er (Specify)	
OTES: 1	The above (to not cons	titute all of	the information	, require	d by Chapt	er 62-160 F A	С			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE DCATION: `	Jacksonville, FL				
WELL NO	EKMW-14			SAMPLE I	D: EKMV	V-14			DATE:	1/28/20	20
					PURC	SING DA	ТА				
WELL VO	R (inches): 2 LUME PURGE: It if applicable)	TUBIN DIAMI 1 WELL VC	ETER (inches)		H: <u>19</u> fe H – STA		,	R (feet): 6	50 _{OF} TY	RGE PUMP T BAILER:	PP
	NT VOLUME P It if applicable)	URGE: 1 EQ	= (UIPMENT VO	L. = PUMP VOLU	eet – ME + (TUB	ING CAPACI	feet) X TY X TL	BING LENGTH	gallons/fo + FLOW C		gallons 0.6
				= <i>O</i> galio	ons + (0.	0026 galle	ons/foot X 3 d	o feet)	+ 0.132	gallons	= 0.2/gallons
	JMP OR TUBIN WELL (feet):	^{IG} /9		IMP OR TUBING	19	PURGIN INITIATI	IG ED AT: 15:40	PURGING ENDED AT:	15:45	TOTAL VO PURGED (LUME gallons): 0, 25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm <u>or</u> برگاری	DISSOLVED OXYGEN (circle units) rool or % saturation	TURBIDI (NTUs		
15:45	0.25	0.25	0.05	8.47	5.80	22.51	2446	1.12	11.)	clea	12.2
				_							_
			_	_							
					_				×		
						121					
	1										
TUBING IN	PACITY (Gallor SIDE DIA. CA	PACITY (Gal.		1" = 0.04; 1 0.0006; 3/16" = BP = Bladder Put	0.0014;	1/4" = 0.002		004; 3/8" = 0	5" = 1.02; .006; 1/2 eristaltic Pur	2" = 0.010;	12 " = 5.88 5/8 " = 0.016 Other (Specify)
						LING DA					
	BY (PRINT) / A ZIAckgr			SAMPLER(S) SI		E(S):		SAMPLING INITIATED A	r. 15:5		NG 16:05
PUMP OR			ssyna	TUBING	-7	up	FIELD-	FILTERED: 1			SIZE:0 <u>,45</u> μm
	WELL (feet):	19		MATERIAL COL		PE,S	Filtratic	n Equipment Ty	pe: / - / - / - / - / - / - / - / - / - /	u	
			C	<u> </u>	TUBING		placed)	DUPLICATE:		Ø	1
	PLE CONTAINE # CONTAINERS			S/ PRESERVATIVI USED	ET	RESERVATIO OTAL VOL D IN FIELD (1	FINAL	INTENDI ANALYSIS A METHO	ND/OR E	Sampling Equipment Code	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-14	1	CHEMETS	25 mL	- NA			-	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-14	3	AG	40 mL	H2S04			-	тос		APP	C100
EKMW-14	1	PE	250 mL	NONE		-	-	SO42-		APP	~ 300
EKMW-14		PE	250 mL	HNO3			-	Sulfur, Te		APP	~ 300
EKMW-14	@12	PE	250 mL	HNO3	_		-	Fe, win	Dissour	(A)APP	~ 300
EKMW-1		66	yone	HCI		-	-	VOCS		APP	2100
REMARKS	A AGU UNITON COLOR			quipment volume IEMETS colorimeti		npling.	Sz00: 5.	o mg/L			
MATERIAL	CODES:	AG = Amber	Glass; CG	≠ Clear Glass;	PE = Poly	ethylene;	PP = Polypropyle	ene; S = Silico	one; T = T	eflon; O = 0	Other (Specify)
SAMPLING	EQUIPMENT			eristaltic Pump; se Flow Peristaltic	B = Bail Pump;		Bladder Pump; Method (Tubing	ESP = Electr Gravity Drain);		ble Pump; er (Specify)	
OTES: 1.	The above of			the information							

2 STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP					lacksonville, FL					
WELL NO): EKMW-11			SAMPLE					DATE:	ړ	11/20	.)
					PURC	GING DA	ТА				1.10	<u> </u>
WELL	ER (inches); 2	TUBI	IG	ALLA WEL				DEPTH UC			E PUMP TY	^{PE} ~~~
	ER (inches):		ETER (inches):		TH: 19 fe	TIC DEPTH T	eet TO WATER	R (feet):		OR BAI	LER:	PP-
	ut if applicable)		= (:			,				-	-
EQUIPME	ENT VOLUME P	URGE: 1 EC						JBING LENGTH	1) + FLO		VOLUME	gallons
(only fill o	ut if applicable)			= () ga	allons + (📲	gallo	ins/foot X	h(2 fee	t) + 0.	132.	· gallons =	~0.35. gallons
	UMP OR TUBIN	IG ,		MP OR TUBING	6	PURGIN	G	PURGING		T	OTAL VOLU	JME
DEPTHI	N WELL (feet):	21	DEPTH IN	WELL (feet):	21		DAT: נאס	ENDED AT	113	<u>3</u> P	URGED (ga	llons): 0.3
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or vs/cm	OXYGEN (circle units) ng/() or % saturation		BIDITY TUs)	COLOR (describe	
1137	0.25	0.25	5 0.03	1 (e.45	2.64	24,29	INTIA	1.48	20	2	ricce	r 528.
				00.00	Childe I	LA BLOWT			au	<u> </u>		100.
			×									
WELL CA	PACITY (Galion	Por Footh:	0.75% - 0.02:	42 = 0.04:	4.95% - 0.0	C: 01 - 0.1	6; 3" = 0.37;	4 " = 0.65;	5 " = 1.0	0. 01	= 1.47; 1	2" = 5.88
TUBING I	NSIDE DIA. CAI	PACITY (Gal	/Ft.): 1/8" = 0	0006; 3/16 "	= 0.0014;					1/2" = (/8" = 0.016
PURGING		ODES:	B = Bailer;	BP = Bladder P			Submersible Pu	mp; PP = F	Peristaltic	Pump;	O = Oth	er (Specify)
SAMPLET	BY (PRINT) / A	FEILIATION		SAMPLER(S)								
	sunso	A	osinter	11	GIGNATON	_(0).		SAMPLING	AT: 113	5	SAMPLING ENDED AT	
PUMP OF	TUBING	100	0.000	TUBIN	0	-0	FIELD	FILTERED:	2 N		FILTER SIZ	Έ: . 45 μm
	I WELL (feet):	ON: PUI	WP Y (N	MATERIAL CO		5,2		DI Equipment				
			Y			RESERVATIO	placed) -	DUPLICATE				
SAMPLE ID CODE	# CONTAINERS	MATERIAL	VOLUME	PRESERVATI	VE	TOTAL VOL	, FINAL	ANALYSIS A METHO	AND/OR	EQUI	PLING PMENT DDE	SAMPLE PUMP FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA		-	-	S2O8 (Per	sulfate)	A	PP	~150
EKMW-11	3	AG	40 mL	H2S04		-	62	TOC		A	PP	1
EKMW-11	1	PE	250 mL	NONE		-	2201	SO42		A	PP	+
EKMW-11	1	PE	250 mL	HNO3		-	12	Sulfur, T	otal	A	PP	
EKMW-11	٢	PE	250 mL	HNO3		-	1	A SUFFE, Mr	1		.PP	
W/WW-1	3	CG	Yome	ACI		-	47	VOC	B	V-	366	*
REMARKS	4400100	ally purges dr ulfate tested i	Purge one ec n field with CHE	uipment volume EMETS colorime	e prior to sar etric tubes.	^{mpling} 3	208 = 1	128m	8/2	•		
MATERIA	L CODES:	AG = Amber	Glass; CG =	Clear Glass;	PE = Poly	ethylene;	PP = Polypropyl	ene; S = Silic	one; T	= Teflon	; 0 = Oti	ner (Specify)
SAMPLING			APP = After Pe	ristaltic Pump; e Flow Peristal	B = Bai		Bladder Pump; Method (Tubing	ESP = Elect		nersible P Other (Sp		
DTES: 1.	The above of						er 62-160, F.A		0 - 0	omer (ap	cony)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE	NAS JAX EK	ТАР				TE	Jacksonville, FL				
NAME:	EKMW-12			CAMPLE		DCATION:		T	DATE	1 1	_
WELL NO				SAMPLE						SIMP	0
WELL		TUBI	NG.	10/5	LL SCREEN	SING DA		DEDTU			NOF
DIAMETEI	v (inches).	2 DIAM	ETER (inches):	Vy def	PTH: 19 fe	et to 23 f	eet TO WAT	ER (feet): 6.0		rge pump t Bailer:	PPP PO
WELL VO	LUME PURGE t if applicable)	: 1 WELL V	DLUME = (TOT	AL WELL DEF	PTH – STA	TIC DEPTH 1	OWATER) X	WELL CAPAC	ITY		
	,		= (UIPMENT VOL		feet -		feet) > TY X 1		gallons/foo	ot =	gallons
(only fill ou	t if applicable)	UNCE. TEC		-)+0.15		20.25
INITIAL PL	JMP OR TUBIN	NG		P OR TUBING	3			PURGING)+01	gallons TOTAL VO	
	WELL (feet):			WELL (feet):	21			ENDED AT:	1212	PURGED (
	VOLUME	CUMUL.	PURGE	DEPTH TO	рН	TEMP.	COND. (circle units)	DISSOLVED OXYGEN	TURBIDIT		R ORP
TIME	PURGED (gallons)	PURGED (gallons)	RATE	WATER	(standard units)	(°C)	umhos/cm)	(errcle units) (mg)L or	(NTUs)	(descri	
		(galions)		(feet)	11.000		or S/cm	secturation		0140	NANCI
1210	0.25	0,25	0.03	9.00	4.17	2002	200.	0.38	119	ciec	U 325.4
			_							_	
				+							
							34				
									-	-	
										1.6	
WELL CAR	ACITY (Gallor	Ber Foot):	0.75 " = 0.02;	1 " = 0.04;	1 25" - 0.0	6; 2" = 0.1	6: 3 " = 0.37;	4 " = 0.65;	5 " = 1.02;	6 " = 1.47;	401 5.00
TUBING IN	SIDE DÍA. CA	PACITY (Gal	<u>/Ft.): 1/8" = 0.02</u>							6 " = 1.47, ' = 0.010;	12" = 5.88 5/8" = 0.016
PURGING	EQUIPMENT (CODES:	B = Bailer, E	3P = Bladder F			Submersible Pu	ump; PP = Pe	eristaltic Pump	p; O = C	ther (Specify)
SAMPLED	BY (PRINT) / A	FFILIATION	,	SAMPLER(S)		LING DA	AIA				
A	5.0	reston	bee	12				SAMPLING INITIATED AT	1215	SAMPLIN ENDED /	
PUMP OR		2.1		TUBING MATERIAL C				D-FILTERED:	N	FILTER S	IZE: •45 μm
			1	WATERIAL C		YRM	placed)-	DUPLICATE:		(N)	
SAMF		ER SPECIFIC	ATION	/	SAMPLE PR	ESERVATIO		INTENDE	- T	AMPLING	SAMPLE PUMP
SAMPLE	#	MATERIAL	VOLUME	PRESERVAT	IVE T	OTAL VOL	FINAL	ANALYSIS AI METHO	ND/OR EC		FLOW RATE (mL per minute)
ID CODE EKMW-12	CONTAINERS 1	CODE	25 mL	USED NA	ADDE			S2O8 (Pers		APP	
EKMW-12	3	AG	40 mL	H2S04	-	1	-	TOC		APP	1
EKMW-12	1	PE	250 mL	NONE			4.17			APP	
EKMW-12	1	PE	250 mL	HNO3			23	Sulfur, To	otal	APP	
EKMW-12	2	PE	250 mL	HNO3				TRACENER	8	APP	
EKIND-	9	<u>C6</u>	40ml	HU		¥	¥	VOCA		MAP	*
REMARKS:	Well Historica	ally purges dr	/. Purge one equin field with CHE	uipment volum METS colorim	e prior to san etric tubes.	npling.	S,08 .	= ~ 1.4.	,		
MATERIAL	CODES	AG = Amber	Glass; CG =	Clear Glass;	PE = Poly	ethylene;	PP = Polypropy	lene; S = Silico	ne; T = Tef	flon; O = 0	Other (Specify)
SAMPLING	EQUIPMENT	CODES:	APP = After Per		B = Bail	er; BP =	Bladder Pump;	ESP = Electri	ic Submersibl	e Pump;	
OTES: 1	The above (RFPP = Reverse					Gravity Drain);	O = Other	(Specify)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

D

pH: \pm 0.2 units Temperature: \pm 0.2 °C Specific Conductance: \pm 5% Dissolved Oxygen: all readings \leq 20% saturation (see Table FS 2200-2); optionally, \pm 0.2 mg/L or \pm 10% (whichever is greater) Turbidity: all readings \leq 20 NTU; optionally \pm 5 NTU or \pm 10% (whichever is greater)

SITE	NAS JAX EK	TAP				TE	acksonville, FL				
WELL NO:	EKMW-13B			SAMPLE ID		DCATION:			DATE	NU	120
					_	SING DA	ТΔ				H
WELL		TUBIN			SCREEN	INTERVAL	STATIC			PURGE PUMP ⁻ OR BAILER:	TYPE O
			ETER (inches):		1: 19 fe	et to 23 f	eet TO WAT	ER (feet): 5.4		OR BAILER:	PP
	if applicable)			_							
		URGE: 1 EQ	= (UIPMENT VOL.	= PUMP VOLUM	et – /IE + (TUE	BING CAPACI	feet) X TY X T	UBING LENGTH)	+ FLOW	s/foot = CELL VOLUME	gallons
(only fill out	if applicable)			= 1 gallo	ns + (allo gallo	ns/foot X	bU feet)	+ ,1	3≻ gallons	= ~ 0.35 gallons
	MP OR TUBIN WELL (feet):	ig di	FINAL PUM DEPTH IN V	P OR TUBING VELL (feet):	21	PURGIN	G ED AT: \\Y > (PURGING ENDED AT: DISSOLVED	144	TOTAL VO	
TIME	VOLUME PURGED (galions)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µ8/cm	OXYGEN (circle units) (circle units) (004 or % saturation	TURB (NTI		
MUI	0.25	0.25	. 6.03	7.70 2	.961	25.30	3429	0.be	9,1	1 Cleo	1 Zide.
			_				: T				
		10	_								
										1	
			0.75" = 0.02; /Ft.): 1/8" = 0.0	1" = 0.04; 1. 0006; 3/16" =		6; 2" = 0.1 1/4" = 0.002				6" = 1.47; 1/2" = 0.010;	12" = 5.88 5/8" = 0.016
PURGING I		CODES: I	B = Bailer; B	P = Bladder Pur	np; E	SP = Electric	Submersible Pu	ump; PP = Pe	eristaltic F	Pump; O =	Other (Specify)
SAMPLED	BY (PRINT) / A			SAMPLER(S) SI		LING DA		705622			
AC	June		al 12	N		L(0).	w)	SAMPLING INITIATED A	: 144	5 SAMPLI ENDED	ng AT: 155.
PUMP OR T		NI		TUBING MATERIAL COD	C	2-4		D-FILTERED:) N		SIZE: 45 µm
			1			Y N(re	placed)	DUPLICATE:	Y Y) N	
SAMP	LE CONTAIN	R SPECIFIC		SA	MPLE PF	RESERVATIO		INTENDE		SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED		TOTAL VOL D IN FIELD (I	nL) FINAL	ANALYSIS AI METHO		EQUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-13B	- 1	CHEMETS	25 mL	NA	ADDE			S2O8 (Pers	ulfate)	APP	~ loc
EKMW-13B	3	AG	40 mL	H2S04			12	тос		APP	
EKMW-13B	1	PE	250 mL	NONE			3.81	SO42-		APP	
EKMW-13B	1	PE	250 mL	HNO3			62	Sulfur, To	otal	APP	
EKMW-13B	3	PE	250 mL	HNO3				arssorfe, Mn		APP	
REMARKS:		CG	Your	HC.		¥	*	VUCS	5	APP	
	110000			uipment volume p METS colorimetr		^{mpling.} S	JUg = 1	0.7 mg	sle		
MATERIAL	CODES:	AG = Amber	Glass; CG =	Clear Glass;	PE = Poly	ethylene;	PP = Polypropy	/lene; S = Silico	ne: T=	= Teflon; 0 =	Other (Specify)
SAMPLING	EQUIPMENT	CODES:	APP = After Per		B = Bai	iler; BP =	Bladder Pump;		ic Subme	rsible Pump; ther (Specify)	
				Ne information VARIATION OF I				A.C. s (see FS 2212	, SECTIO	<u>N 3)</u>	
pH: opt	: <u>+</u> 0.2 units	Temperatu	re: <u>+</u> 0.2 °C S	pecific Condu	uctance:	: <u>+</u> 5% Dis	solved Oxyge	en: all readings ptionally <u>+</u> 5 NT	<u><</u> 20% s	aturation (see	Table FS 2200-
		22									r is greater) bruary 12, 200
10.	in a	A.	all are	ADT S	Da				1.04101		
- til	xa au	ptor	un opt	cept s d tuk	5 ~ 4	4.1	to ale	1/04		2	
*8	witch	es de	edicate	d The	Sing	r and	10 0ar	nune -			

SITE NAME:	NAS JAX EK	K TAP				TE DCATION:	Jacksonville, FL				
WELL NO	D: EKMW-14			SAMPLE					DATE:	Jul-	J N
L					PURC	SING DA	TA			me	
WELL	R (inches):	2 TUB	ING /IETER (inches):		L SCREEN		STATIC			E PUMP TY	PEOP
WELL VO	LUME PURGE	: 1 WELL V			TH - STA	TIC DEPTH	TO WATER) - X	ER (feet): 5.7 WELL CAPACI	O OR BA	ILER:	FI
	ut if applicable)		= (<u> </u>	feet -	-	feet) X	_	gallons/foot	-	gallons
(only fill o	ENT VOLUME F ut if applicable)	PURGE: 1 E	QUIPMENT VOL					UBING LENGTH)	+ ELOW CELL	VOLUME	
					allons + (0			6 feet)			へ D. XS gallons
	UMP OR TUBIN WELL (feet):	21		VIP OR TUBINO WELL (feet):	21	PURGIN	IG ED AT: 155	7 PURGING ENDED AT:		OTAL VOLU	
TIME	VOLUME PURGED (gallons)	CUMUL VOLUM PURGE (gallons	E PURGE D RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP, (°C)	COND. (circle units) μmhos/cm or μs/cm	DISSOLVED OXYGEN (circle units)	TURBIDITY (NTUs)	COLOR (describe	
1550	0.25	0.25		8.70	5.71	25.48	2700	% saturation	1800	Clea	1 -2405
~~~~	0.05	10.00	urga	0000	2.11	0.2.48	00100	0.58	1000	Lieu	A - Jon
	_		-								
	-		-								
	-	-			-						-
											_
								-			
WELL CA TUBING I	PACITY (Gallor NSIDE DIA. CA	ns Per Foot): PACITY (Ga	0.75" = 0.02; I./Ft.): 1/8" = 0.	1" = 0.04; 0006; 3/16"	1.25" = 0.00 = 0.0014;	3; 2" = 0.1 1/4" = 0.002					2" = 5.88 /8" = 0.016
A	EQUIPMENT (		and a state of the second second	<b>BP</b> = Bladder P	the second s		Submersible Pu		eristaltic Pump;		er (Specify)
SAMDI ED	BY (PRINT) / /			CAMPLED(O)		LING DA	ATA				
ANIPLEL	-1.	kon	600	SAMPLER(S)		:(S):	6	SAMPLING	1555	SAMPLING	
PUMP OR	TUBING	N		TUBING	DE	0		-FILTERED:			Έ: <b>15</b> μm
	WELL (feet): CONTAMINATI		IMP Y N	MATERIAL CO	TUBING	Y IND	Filtrati placed)	on Equipment Typ DUPLICATE:	and the second se	N	3
	PLE CONTAINI		Y			ESERVATIO		INTENDE		T	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATI USED	VE T	OTAL VOL D IN FIELD (J	FINAL	ANALYSIS AM METHO	ND/OR EQU		FLOW RATE (mL per minute)
EKMW-14	1	CHEMETS	25 mL	NA		-	- 1	S2O8 (Persu	ulfate) A	PP	N150
EKMW-14	3	AG	40 mL	H2S04	_	_	62	TOC	<i>F</i>	PP	
EKMW-14	1	PE	250 mL	NONE	_	_	5.71	SO42-		APP	
EKMW-14 EKMW-14	1	PE PE	250 mL 250 mL	HNO3 HNO3		-	62	Sulfur, To			
EVLIMIN	3	(1)	Mone	HCI		V	1	VOC		APP	+
REMARKS	Well historica	ally purges d	ry. Purge one eq in field with CHE	uipment volum	e prior to san	npling. S.	Da = A	- Dwg/L		717	<u>v</u>
MATERIAL	CODES:	AG = Ambe	r Glass; CG =	Clear Glass;	PE = Poly	ethylene:	PP = Polypropyl	01-	ne; <b>T</b> = Teflor	) <b>0</b> = 0#	ner (Specify)
			APP = After Per RFPP = Revers	ristaltic Pump;	B = Bail	er; BP =	Bladder Pump; Method (Tubing	ESP = Electri	c Submersible F	ump;	ier (opcony)
OTES: 1.	The above o	do not con	stitute all of t						2 34141 (0		

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE					S	ITE					
NAME:	NAS JAX EK	СТАР				DCATION:	Jacksonville, FL		-		
WELL NO	D: EKMW-11			SAMPL	e id: ekm	<i>W</i> -11			DATE:	2125/20	20
					PUR	GING DA	TA				-
and the second sec	ER (inches).		ETER (inches)	: 1/4 DE		eet to 23 f		ER (feet): 5.	14   c	PURGE PUMP T DR BAILER:	YPE PP
(only fill o	DLUME PURGE out if applicable)	: 1 WELL V		TAL WELL DE		TIC DEPTH 1		WELL CAPAC			_
EQUIPME		URGE: 1 E	= (	L = PUMP VC	feet –		feet) X TY X T	UBING LENGTH		foot =	gallons
(only fill o	ut if applicable)	- - -		_		0026 gallo			+ 0.00		= 0.20 gallons
INITIAL P	UMP OR TUBIN	IG _ (	FINAL PU	MP OR TUBIN		PURGIN				TOTAL VO	
	N WELL (feet):	21	DEPTH IN	WELL (feet):	21	INITIATI	ED AT: 10:58	BISSOLVED	11:02		gallons): 0.25
TIME	VOLUME PURGED (gallons)	CUMUL VOLUME PURGEI (gallons)	PURGE RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP. ( [°] C)	COND. (circle units) µmhos/cm or aS/cm	OXYGEN (circle units) mg/ <u>or</u> % saturation	TURBII (NTU		
11:02	0.25	0.25	0.06	6.94	2.65	22.45	6342	2.71	12.	9 cles	r 592.3
1		1									
	PACITY (Gallor			1" = 0.04;	<b>1.25</b> " = 0.0	6; <b>2''</b> = 0.1	6; <b>3</b> " = 0.37;		<b>5''</b> = 1.02;	6" = 1.47;	12" = 5.88
	NSIDE DIA. CA				and a share of the second s	1/4" = 0.002	New York			/2" = 0.010;	5/8" = 0.016
FURGING		JODES:	B = Bailer;	BP = Bladder		LING DA	Submersible Pu	mp; <b>PP</b> = Po	eristaltic Pi	ump; <b>O</b> = C	ther (Specify)
SAMPLED	BY (PRINT) / A	FFILIATION		SAMPLER(S	) SIGNATURI	E(S):					-
Byu	- Zincka	raf/G	cosynte	- B	-2	nl	1	SAMPLING	r: 11÷11	SAMPLIN ENDED A	AT: 11-25
PUMP OR	TUBING	2		TUBING	b	E,S	FIELD	-FILTERED: 🕂	N		12E0.45 µm
	WELL (feet):			MATERIAL				on Equipment Ty			1 and 5 are
				D	TUBING		placed)	DUPLICATE:	Y	Ø	
SAM	PLE CONTAINE #		ATION	DECEDIA		RESERVATIO		INTENDE ANALYSIS A		SAMPLING	SAMPLE PUMP FLOW RATE
ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVA USED		OTAL VOL D IN FIELD (1	nL) pH	METHO		CODE	(mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA			-	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-11	3	AG	40 mL	H2S04		-		TOC		APP	c100
EKMW-11	1	PE	250 mL	NONE	-		-	SO42-		APP	~ 300
EKMW-11	1	PE	250 mL	HNO3				Sulfur, To		APP	~ 300
EKMW-11	12	PE	250 mL	HNO3			-	Fe, Mn	Dissol	APP	~ 300
EKMW-11	3	CG	40mL	HCI		-	A	VOC	s	APP	<100
REMARKS	won matchice	ally purges dr ulfate tested	y. Purge one ea in field with CH	quipment volur EMETS colorir	ne prior to sar netric tubes.		208:45 role roun	0 mg/L	(10:1 campl	diwhon)	nia.
MATERIAL	CODES	AG = Ambe	Glass; CG	= Clear Glass;	PE = Poly		PP = Polypropyl				Other (Specify)
SAMPLING	S EQUIPMENT		APP = After Pe RFPP = Revers				Bladder Pump; Method (Tubing	ESP = Electr Gravity Drain);		sible Pump; her (Specify)	
OTES: 1.	The above o						er 62-160, F.A				

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

WELL NO:         EKMW-12         DATE:         2/15 [2:0:0           URGING DATA           WELL DUMETER (inches):         2         TUBING DUMETER (inches):         2         TUBING DUMETER (inches):         Y         DEPTH         STATIC DEPTH         OWNER (red; 5: 0         PURCE PUMP TYPE ON WATER (red; 5: 0         PURCE PURCE 1: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0: 0:	SITE NAME:	NAS JAX EK	ТАР				ITE OCATION:	lacksonville, FL						
PURGING DATA           WELL DIAMETER (inches): 2         TUBING DIAMETER (inches): 4/4         WELL SCREEN INTERVAL VOLUME (inches): 1/4         STATIC DEPTH Is feet to z3 feet TO WATER (itee): 5.10         DURGE PUMP TYPE OR BALLER         DURGE PUMP TYPE OR DURGE PUMP TYPE OR DURGE PUMP TYPE TY TYPE TY TYPE TY TYPE OR DURGE PUMP TYPE TY TYPE TYPE TYPE TY TYPE TYPE OR DUP TYPE TYPE TYPE T		EKMW-12			SAMPL					DATE:	2/25	-12020	-)	
WELL DIAMETER (inches):         TUBINO DIAMETER (inches):         TUBINO DIAMETER (inches):         TUBINO DIAMETER (inches):         TUBINO DEPT H:         Total cost at test to 23 test TOWATER (ited):         TUBINO DEPT H:         PURCE PUMP VPE OR BAILER:         PURCE PUMP VPE OR BAILER:         PURCE PUMP VPE OR BAILER:         PUMP VE OR BAILER: <td></td> <td></td> <td></td> <td></td> <td></td> <td>PUR</td> <td>GING DA</td> <td>TA</td> <td>I</td> <td></td> <td>6160</td> <td>1000</td> <td></td>						PUR	GING DA	TA	I		6160	1000		
WELL VOLUME PURGE:         1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER)         X WELL CAPACITY           (only fill out if applicable)         = (         feet -		R (inches): 2				ELL SCREEN	INTERVAL	STATIC	DEPTH	0				
EQUIPMENT VOLUME PURGE:         1 EQUIPMENT VOL.         ret://rule         ret://rule         ret://rule         rule         rule <thrule< th=""></thrule<>	WELL VOI	LUME PURGE:						O WATER) X	WELL CAPAC	YTK		-1.	FF	
Intrial publicable)       = 0 gallons + ( g, vo ZC gallons/foot X       2.5 feet) + 0.132 gallons = 0.26 ga				= (		feet –		feet) X	<	gailon	s/foot =	_	gallons	
INITIAL PUMP OR TUBING DEPTH IN WELL (teet):         2.1         FINAL PUMP OR TUBING DEPTH IN WELL (teet):         FINAL PUMP OR TUBING DEPTH IN WELL (teet):         2.1         PURGING INITIAL TED AT:         PURGING FINAL PUMP OR TUBING DEPTH IN WELL (teet):         2.1         PURGING INITIAL TED AT:         PURGING FINAL PUMP OR TUBING PURGE         PURGE PURGE         PURGE			URGE: 1 EQ	UIPMENT VO	L. = PUMP VC	LUME + (TU	BING CAPACI	тү х т	UBING LENGTH	i) + FLOW	CELL VO	DLUME	0.20 BI	
DEPTH IN WELL (feet):         21         INITIATED AT:         11'SQ         PURDED AT:         11'SQ         PURGED (gallons):         0.           TIME         VOLUME PURGED         CUMUL. Question         OEPTH IN WELL (feet):         21         INITIATED AT:         11'SQ         PURDED AT:         11'SQ         PURGED         PURGED <td< td=""><td></td><td></td><td></td><td>17</td><td></td><td></td><td></td><td></td><td></td><td>t) + 💋 , (</td><td></td><td>-</td><td>-gallona</td></td<>				17						t) + 💋 , (		-	-gallona	
TIME         VOLUME PURGED         CUMUL PURGED         PURGE RATE         DEPTH TO WATERIAL (gallons)         PH (ret)         Depth (ret) (ret)         TEMP, (ret)         COND. (ret)         OXYGEN (ret)         TUBIDITY (NTUS)         COLOR (describe)         O           /// Saluration         (gallons)         (gallons)         (gpm)         (feet)         1.25         // O.7         CLOR         0           /// Saluration         0         0.25         0.25         0.06         6.82         4.18         23.19         3355         // O.7         CLOR         0           // Saluration         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0			^G 21			^G 21		ig Ed at: 11 · 5	0 ENDED AT	<u></u> 11÷5				
WELL CAPACITY (Gallons Per Foct):         0.75" = 0.02;         1" = 0.04;         1.25" = 0.06;         2" = 0.16;         3" = 0.37;         4" = 0.65;         5" = 1.02;         6" = 1.47;         12" = 0.01;         36" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12" = 0.01;         12	TIME	PURGED	VOLUME PURGED	RATE	TO WATER	(standard		(circle units) μmhos/cm	OXYGEN (circle units)				ORP ) (mV)	
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.008; 1/2" = 0.010; 5/8" = 0.010;         PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PP = Peristaltic Pump; O = Other (Specific Submersible Pump; PUMP) / AFFILIATION:         SAMPLE D BY (PRINT) / AFFILIATION:         SAMPLER(S) SIGNATURE(S):       SAMPLER(S) SIGNATURE(S):       SAMPLER(S) SIGNATURE(S):       SAMPLER(S) SIGNATURE(S):       SAMPLER(S) SIGNATURE(S):       SAMPLING INTIATED AT: 12:00       SAMPLING INTIATED AT: 12:00       SAMPLING INTIATED AT: 12:00         PUMP'OR TUBING DECONTAMINATION:       PUMP Y       TUBING Y       FIELD-FILTERED: FILTERED: FILTERED: FILTER SIZE: 9.95       SAMPLE       FILTER SIZE: 9.95       SAMPLE       SAMPLE       SAMPLE       SAMPLE CONTAMINATION: PUMP Y       Y       TUBING Y       V(colaced)       DUPLICATE: Y       SAMPLE       SAMPLE       SAMPLE       SAMPLING EQUIPMENT CODE       SAMPLE       SAMPLE       SAMPLE       SAMPLE       SAMPLE       SAMPLE       SAMPLING EQUIPMENT CODE       SAMPLE <t< td=""><td>11:54</td><td>0.25</td><td>0.25</td><td>0.06</td><td>6.82</td><td>4.18</td><td>23.19</td><td>3355</td><td>1.25</td><td>/0.1</td><td>7</td><td>clear</td><td>213.1</td></t<>	11:54	0.25	0.25	0.06	6.82	4.18	23.19	3355	1.25	/0.1	7	clear	213.1	
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SAMPLING DATA         SAMPLED BY (PRINT) / AFFILIATION:       SAMPLER(S) SIGNATURE(S):       SAMPLING INITIATED AT: 12:00       SAMPLING ENDED AT: 12:10         BAMPLON TUBING       FILED FILTERED: ON FILT	TUBING IN	ISIDE DÍA. CAI	PACITY (Gal.											
SAMPLED BY (PRINT) / AFFILIATION:       SAMPLER(S) SIGNATURE(S):       SAMPLING INITIATED AT: 12:00       SAMPLING ENDED AT: 12:10         PUMP'OR TUBING DEPTH IN WELL (feet):       21       TUBING MATERIAL CODE:       FILED.FILTERED:       N Filtration Equipment Type:         FIELD DECONTAMINATION:       PUMP       Y       Y       TUBING       Y       Y         SAMPLE CONTAINER SPECIFICATION       SAMPLE PRESERVATION       INTENDED ANALYSIS AND/OR MATERIAL       SAMPLE       FILLOR       SAMPLE EQUIPMENT CODE       SAMPLE         SAMPLE       # ID CODE       WATERIAL CODE       VOLUME       PRESERVATIVE USED       TOTAL VOL ADDED IN FIELD (mL)       FINAL PH       INTENDED ANALYSIS AND/OR METHOD       SAMPLE FLOW R (mL per method)	PURGING	EQUIPMENT C	ODES: E	<b>3</b> = Bailer;	BP = Bladder				ump; <b>PP</b> = F	Peristaltic I	Pump;	O = Oth	er (Specify)	
By a Zinckgrof / Geospher       By a Z	SAMPLED	BY (PRINT) / A	FFILIATION:		SAMPLER(S				CAMPUNO					
PUMP'OR TUBING DEPTH IN WELL (feet):     21     TUBING MATERIAL CODE:     PEE, S     FIELD-FILTERED: Filtration Equipment Type:     N     FILTER SIZE:     92       FIELD DECONTAMINATION:     PUMP     Y     Y     TUBING     Y     N'     DUPLICATE:     Y     Y       SAMPLE     CONTAINER SPECIFICATION     SAMPLE     PRESERVATIVE USED     TOTAL VOL ADDED IN FIELD (mL)     FINAL PH     SAMPLING MATERIAL SAMPLE     SAMPLING FLOW R (mL per method)     SAMPLING NATERIAL SAMPLE     SAMPLING CODE			1			1-	Stat	-	INITIATED A	T: 12:0	20   S	NDED AT:	12:15	
FIELD DECONTAMINATION: PUMP Y       Y       TUBING Y       Y       DUPLICATE: Y       Y         SAMPLE CONTAINER SPECIFICATION       SAMPLE PRESERVATION       INTENDED       INTENDED       SAMPLING EQUIPMENT       FLOW R         SAMPLE       #       MATERIAL CODE       VOLUME       PRESERVATIVE USED       TOTAL VOL ADDED IN FIELD (mL)       FINAL PH       SAMPLEODE       SAMPLING EQUIPMENT CODE       SAMPLE IN FIELD (mL)       FINAL PH       MATHOD       SAMPLE IN PH       SAMPLE	PUMP'OR	TUBING 🗸			TUBING	ADDE G	ES	FIELD	D-FILTERED: 👌	🤈 N	FI	LTER SIZ	E: <mark>0.45</mark> µm	
SAMPLE CONTAINER SPECIFICATION     SAMPLE PRESERVATION     INTENDED     SAMPLING										a hard a second s	1	0		
SAMPLE     #     MATERIAL     VOLUME     PRESERVATIVE     TOTAL VOL     FINAL     ANALYSIS AND/OR     EQUIPMENT     FLOW R       DCODE     CONTAINERS     CODE     VOLUME     PRESERVATIVE     TOTAL VOL     FINAL     ANALYSIS AND/OR     EQUIPMENT     FLOW R													SAMPLE PUMP	
	SAMPLE	#	MATERIAL			TIVE	TOTAL VOL	FINAL	ANALYSIS A	AND/OR	EQUIP	MENT	FLOW RATE (mL per minute)	
	EKMW-12	1	CHEMETS	25 mL	NA			<u> </u>	S2O8 (Per	sulfate)	AP	P	~ 300	
EKMW-12 3 AG 40 mL H2S04 - TOC APP	EKMW-12	3	AG	40 mL	H2S04			-	тос		AP	P	2100	
EKMW-12 1 PE 250 mL NONE SO42- APP ~_ 30	EKMW-12	1	PE	250 mL	NONE				SO42		AP	P	~ 300	
EKMW-12         1         PE         250 mL         HNO3          Sulfur, Total         APP         ~_3 o	EKMW-12	1	PE	250 mL	HNO3			-	Sulfur, 7	otal	AP	P	~300	
	EKMW-12	12	PE		HNO3		-	-	Fe, Mr	ı	AP	P	~300	
							_	-		s	AP	P	2100	
REMARKS: Well historically purges dry. Purge one equipment volume prior to sampling. Sodium persulfate tested in field with CHEMETS colorimetric tubes.	REMARKS	Well historica Sodium pers	ally purges dry ulfate tested i	y, Purge one e n field with CH	quipment volui EMETS colorii	me prior to sa metric tubes.	impling.			sano	line			
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Terlon; O = Other (Speci	MATERIAL	CODES	AG = Amber	Glass; CG	= Clear Glass;	PE = Po	yethylene;					O = Oth	er (Specify)	
SAMPLING EQUIPMENT CODES:       APP = After Peristaltic Pump;       B = Bailer;       BP = Bladder Pump;       ESP = Electric Submersible Pump;         RFPP = Reverse Flow Peristaltic Pump;       SM = Straw Method (Tubing Gravity Drain);       O = Other (Specify)         IOTES:       1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.				RFPP = Rever	se Flow Perist	altic Pump;	SM = Straw	Method (Tubin	g Gravity Drain);					

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS.2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

1

Martin Mar	NAS JAX EK	TAP				TE DCATION: J	acksonville, FL				
VVELL NO:	EKMW-13B	18		SAMPLE I	D: EKMV	W-13B		D	ATE: 2	125 /202	6
					PURC	SING DA	TA			Tes fee	0
WELL DIAMETER WELL VOL			ETER (inches):	14 DEPT	SCREEN "H: 19 fe "H – STA	et to 23 fe	STATIC D TO WATE O WATER) X	EPTH R (feet): 4.59 WELL CAPACIT	OR B	ge pump typi Ailer:	PP
-			= (		'eet -		feet) X		gallons/foot		• gallons
	NT VOLUME P t if applicable)	URGE: 1 EQ	UIPMENT VOI	L. = PUMP VOLU	15			BING LENGTH) +			
			T		ons + ( 0	. UUZ (gallo			0.132		0.20 gallons
	JMP OR TUBIN WELL (feet):	21		MP OR TUBING WELL (feet):	21	PURGIN	G D AT: 12:26	LINDED AT.		TOTAL VOLUI PURGED (gall	
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	RATE	DEPTH TO WATER (feet)	pH (standard units)	TEMP ( ^o C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) MGA_ or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (mV)
12:30	0.25	0.25	0.06	6.44	4.60	23.20	3182	0.85	9.64	dear	173.9
					0222			1. A . A . A . A . A . A . A . A . A . A			
	•									2	
T :											
		e.	<u>.</u>								
TUBING IN	ACITY (Gallor ISIDE DIA. CA EQUIPMENT C	PACITY (Gal.	/Ft.): 1/8" = 0	1" = 0.04; 1 .0006; <b>3/16</b> " = <b>BP</b> = Bladder Pu	= 0.0014; imp; E	1/4" = 0.002 SP = Electric	6; <b>5/16''</b> = 0.0 Submersible Pur	004; <b>3/8''</b> = 0.0		= 0.010; 5/8	" = 5.88 I" = 0.016 r (Specify)
				04401 FD/01 0		LING DA	TA	ř –			13:25
	Contraction Contraction	1	20	SAMPLER(S) S		=(5):		SAMPLING	12:40	SAMPLING	
		aC / Geo	Suppor			2/1-		INITIATED AT:			
Byce		-	syntec	TUBING	you	of	FIELD-	INITIATED AT:			
Bya PUMP OR T DEPTH IN T	TUBING WELL (feet):	21	, k	TUBING MATERIAL COL	DE: PE	e,s	Filtratio	FILTERED: n Equipment Type	N	FILTER SIZE	::0 <u>.45</u> μm
Bya PUMP OR T DEPTH IN T	TUBING	21	, k	TUBING MATERIAL COL	1			FILTERED: 🔗	N	FILTER SIZE	13-10-3 ::0.45 μm 01, M.S/N
Bycc PUMP OR DEPTH IN TIELD DEC SAMP	TUBING WELL (feet): CONTAMINATION PLE CONTAINE	21 ON: PUI ER SPECIFIC	MP Y	TUBING MATERIAL COL T) S.	DE: PO	Y MOR	Filtratic placed) N	FILTERED: n Equipment Type DUPLICATE: INTENDEE	N	FILTER SIZE	::0.45 μm D1, M.S/N AMPLE PUMP
By COMP OR DEPTH IN TIELD DEC SAMP	TUBING WELL (feet): CONTAMINATIO	21 ON: PU	MP Y	TUBING MATERIAL COL		Y MRESERVATION	Filtratic placed) N FINAL	FILTERED: O n Equipment Type DUPLICATE:	N D D/OR EQ	FILTER SIZE	::0.45 μm 01, M.S/N
Byu PUMP OR DEPTH IN FIELD DEC SAMP SAMPLE D CODE	TUBING WELL (feet): CONTAMINATIO PLE CONTAINE #	21 ON: PUI ER SPECIFIC MATERIAL		TUBING MATERIAL COL ) S. PRESERVATIV		Y MOR	Filtratic placed) N FINAL	FILTERED: On Equipment Type DUPLICATE: INTENDED ANALYSIS AND	N DOOR EQ	FILTER SIZE	E.O.45 μm DI, M.S/M AMPLE PUMP FLOW RATE
By COMP OR DEPTH IN TIELD DEC SAMPLE D CODE KMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINE # CONTAINERS	2.1 ON: PUM ER SPECIFIC MATERIAL CODE	MP Y ATION VOLUME	TUBING MATERIAL COL S PRESERVATIV USED		Y MRESERVATION	Filtratic placed) N FINAL	FILTERED: n Equipment Type DUPLICATE: INTENDEE ANALYSIS ANI METHOD	N DOOR EQ	FILTER SIZE	Cl, <u>MS</u> μm Cl, <u>MS</u> /M AMPLE PUMF FLOW RATE mL per minute
By COMPOR DEPTHIN TELD DEC SAMPLE D CODE KMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS CONTAINERS 1	2.1 ON: PUI ER SPECIFIC MATERIAL CODE CHEMETS	MP Y ATION VOLUME 25 mL	TUBING MATERIAL COU S PRESERVATIV USED NA		Y MRESERVATION	Filtratic placed) N FINAL	FILTERED: On n Equipment Type DUPLICATE: INTENDED ANALYSIS ANI METHOD S2O8 (Persult	N DOOR EQ	FILTER SIZE N DUP- MPLING UIPMENT CODE (I APP	Cl, MS/M AMPLE PUMF FLOW RATE mL per minute ~ 300
By COMP OR DEPTH IN D	TUBING WELL (feet): CONTAMINATION PLE CONTAINE CONTAINERS 1 3	2.1 DN: PUM ER SPECIFIC MATERIAL CODE CHEMETS CG	MP Y ATION VOLUME 25 mL 40 mL	TUBING MATERIAL COL S PRESERVATIV USED NA HCI		Y MRESERVATION	Filtratic placed) N FINAL pH	FILTERED: On n Equipment Type DUPLICATE: INTENDED ANALYSIS ANI METHOD S2O8 (Persult VOCs	N DOOR EQ	FILTER SIZE N DUP- MPLING UIPMENT CODE (( APP APP	Cl J MS/M AMPLE PUMF FLOW RATE mL per minute ~ 300 < 100
By CUMP OR 3 DEPTH IN 1 FIELD DEC SAMPLE D CODE KMW-13B KMW-13B KMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 3	2.1 ON: PUM ER SPECIFIC MATERIAL CODE CHEMETS CG AG	MP Y ATION VOLUME 25 mL 40 mL 40 mL	TUBING MATERIAL COL S PRESERVATIV USED NA HCI H2S04		Y MRESERVATION	Filtratic placed) N FINAL pH	FILTERED: DUPLICATE: INTENDED ANALYSIS AND METHOD S2O8 (Persult VOCs TOC	N D/OR EQ fate)	FILTER SIZE N DUP- MPLING UIPMENT CODE (( APP APP	::0.45 μm D1, MS/M AMPLE PUMF FLOW RATE mL per minute ~300 <100 <100
Byte DUMP OR 3 EPTH IN 1 EELD DEC SAMPLE D CODE KMW-13B KMW-13B KMW-13B KMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 3 1	2.1 ON: PUM ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE	MP Y ATION VOLUME 25 mL 40 mL 250 mL	TUBING MATERIAL COL S PRESERVATIV USED NA HCI H2S04 NONE		Y MRESERVATION	Filtratic placed) N FINAL pH   	FILTERED: On Equipment Type DUPLICATE: INTENDED ANALYSIS AND METHOD S2O8 (Persult VOCs TOC SO4 ²⁻	N D/OR EQ fate)	FILTER SIZE FILTER SIZE N DUP-1 MPLING UIPMENT CODE APP APP APP	
FIELD DEC	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 3 1 3 1 3 4 1 2 4 1 Well historica	2.1 ON: PUM ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE PE PE PE ally purges dry	MP Y ATION VOLUME 25 mL 40 mL 40 mL 250 mL 250 mL 500 mL 9. Purge one et	TUBING MATERIAL COL S PRESERVATIV USED NA HCI H2S04 NONE HNO3	DE: PC TUBING SAMPLE PR TE ADDE	Y Me RESERVATION TOTAL VOL D IN FIELD (n 	Filtratic placed) N FINAL pH 	FILTERED: DUPLICATE: INTENDEE ANALYSIS ANI METHOD S208 (Persult VOCs TOC SO4 ²⁻ Na ⁺ ; Fe, Mn; S TDS Voc /L	N SAPARA	FILTER SIZE N DUP-1 MPLING UIPMENT CODE APP APP APP APP APP APP	::0.45 μm D1, MS/M AMPLE PUMF FLOW RATE mL per minute ~ 300 < 100 < 200 ~ 300 ~ 300 ~ 300 ~ 300
COMP OR DEPTH IN FIELD DEC SAMP CODE CODE KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B KMW-13B	TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 3 1 3 1 3 4 1 Well historica Sodium pers	2.\ ON: PUM ER SPECIFIC MATERIAL CODE CHEMETS CG AG PE PE PE PE PE ally purges dry ulfate tested in	MP Y ATION VOLUME 25 mL 40 mL 40 mL 250 mL 250 mL 500 mL 9. Purge one et	TUBING MATERIAL COL S PRESERVATIV USED NA HCI H2S04 NONE HNO3 NONE guipment volume EMETS colorimet	DE: PC TUBING SAMPLE PR TE ADDE	Y	Filtratic       placed)       N       FINAL       pH	FILTERED: On Equipment Type DUPLICATE: INTENDED ANALYSIS ANI METHOD S2O8 (Persult VOCs TOC SO4 ²⁻ Na*; Fe, Mn; S TDS	N SALANCE CONTRACTOR Sulfur Sulfur	FILTER SIZE FILTER SIZE N DUP- MPLING UIPMENT CODE APP APP APP APP APP Collected	::0.45 μm D1, MS/M AMPLE PUMF FLOW RATE mL per minute ~ 300 < 100 < 200 ~ 300 ~ 300 ~ 300 ~ 300

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР				TE DCATION: `	Jackso	onville, FL				
WELL NO	: EKMW-14			SAMPLE ID:	EKM	N-14				DATE:	2/25/20	20
1					PURC	<b>GING DA</b>	TA				2100100	20
WELL VO	R (inches): 2 LUME PURGE: It if applicable)	TUBIN DIAME 1 WELL VC	ETER (inches) DLUME = (TO	'/4     WELL S       DEPTH:       TAL WELL DEPTH	CREEN 19 fe - STA	INTERVAL et to 23 f	eet	ATER) X	२ (feet): 🧲 .	50   c TY	PURGE PUMP TY OR BAILER:	PP
(only fill ou	ut if applicable)		= ( UIPMENT VO	fee L. = PUMP VOLUMI = O gallon	E + (TUE				BING LENGTH)			gallons
INITIAL P DEPTH IN	UMP OR TUBIN I WELL (feet):	G2179		MP OR TUBING I WELL (feet):	2(	PURGIN	IG ED AT	: 14:50	PURGING ENDED AT:	14:54	TOTAL VOL	
TIME	VOLUME PURGED (gallons)	CUMUL, VOLUME PURGED (gallons)		WATER (SI	pH andard units)	TEMP. ( ^o C)	C (circ μm	COND. cle units) hhos/cm	DISSOLVED OXYGEN (circle units) mg/ or % saturation	TURBII (NTU		
14:54	0.25	0.25	0.06	7.03 6	.97	22.06	2	646	1.73	19.	3 char	- 25. (
TUBING I		PACITY (Gal.		1" = 0.04; 1.2 0.0006; 3/16" = 0 BP = Bladder Pum	.0014;		26	<b>5/16"</b> = 0.0	004; <b>3/8</b> " = 0	5" = 1.02; .006;	1/2" = 0.010;	12" = 5.88 5/8" = 0.016 ther (Specify)
						LING DA	<b>ATA</b>					
Bru	BY (PRINT) / A			SAMPLER(S) SIG	NATUR	E(S):		/	SAMPLING INITIATED AT	15:0	5 SAMPLIN ENDED A	IG AT: 15:20
PUMP OR	TUBING WELL (feet):	21		TUBING MATERIAL CODE	B	E,S			FILTERED: 💋		FILTER S	IZE: 0. 45 µm
	CONTAMINATIO		MP Y		UBING		place		n Equipment Ty DUPLICATE:	pe: Y	Ø	
	PLE CONTAINE		C	<u> </u>	_	RESERVATIO		,	INTENDE	1	SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL	VOLUME	PRESERVATIVE	1		1	FINAL pH	ANALYSIS A METHO	ND/OR	EQUIPMENT	FLOW RATE (mL per minute)
EKMW-14	1	CHEMETS	25 mL	NA					S2O8 (Pers	ulfate)	APP	~ 300
EKMW-14	3	AG	40 mL	H2S04					TOC		APP	6100
EKMW-14	1	PE	250 mL	NONE		-			SO42-		APP	~ 300
EKMW-14	5 1	PE	250 mL	HNO3		-			Sulfur, To		APP	~ 300
EKMW-14	×2	PE	250 mL	HNO3				<b>-</b> - 1	Fe, Mn	(Dissa	ved APP	~ 300
EKMW-14	3	CG	40 mL	HCI				_	Voc		APP	<100
REMARKS	won matariat			quipment volume pr EMETS colorimetric	tubon				. 0 mg/L ck suspend		ht room d	sample.
MATERIA	L CODES:	AG = Amber	Glass; CG	= Clear Glass; F		yethylene;			ene; <b>S</b> = Silico			Other (Specify)
			RFPP = Reve	eristaltic Pump; se Flow Peristaltic F		SM = Straw	Meth		ESP = Electr Gravity Drain);		rsible Pump; ther (Specify)	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP			SI	TE DCATION:	Jacksonville	e, FL					
	EKMW-11			SAMPLE							10/20	)	
					PURC	SING DA	TA						
			TER (inches):	14 DEP	L SCREEN TH: 19 fe	INTERVAL et to 23 f	eet TO	) X	EPTH R (feet): 42	C OR	RGE PUMP T' BAILER:	PP -	illons
	IT VOLUME PI if applicable)	JRGE: 1 EQL			UME + (TUE		ITY X	τu	BING LENGTH)	+ FLOW CE		~().)	
	MP OR TUBIN WELL (feet):	G 21		IP OR TUBINO WELL (feet):	えい	PURGIN INITIATI	IG ED AT: U	20		1036	TOTAL VOI PURGED (g	allons): <b>D</b>	.ч
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	CONE (circle ur µmhos/ or	nits) cm	DISSOLVED OXYGEN (circle units) <u>or</u> % saturation	TURBIDIT (NTUs)	(descrit	pe) (m	RP IV)
10300	0.05	0.25	0.03	6.5).	2.76	33.14	772	10	1.36	10.3	clee	W 58	1.3
			_								_		
								_			_		
												_	
TUBING IN	ACITY (Gallon SIDE DIA. CAR	PACITY (Gal./	Ft.): 1/8" = 0.	in a second	<b>1.25</b> " = 0.0 = 0.0014;	1/4" = 0.002	26; 5/16	0.37; i'' = 0.0	004; <b>3/8''</b> = 0	and the second se	6" = 1.47; " = 0.010;	12" = 5.88 5/8" = 0.016	
PURGING	EQUIPMENT C	ODES: B	= Bailer;	BP = Bladder I	and the second			ole Pun	np; PP = P	eristaltic Pum	ip; 0 = 0	ther (Specify	/)
	BY (PRINT) / A			SAMPLER	the second se			_	SAMPLING INITIATED A		SAMPLIN		<del>v</del>
PUMP OR	TUBING	(6ed	syntec	TUBING	~ ~	-0			FILTERED: 🖉	) N		IZE:0.45	
	WELL (feet):		AP Y	MATERIAL C		ES	eplaced)	Filtratic	DUPLICATE:		(N)		
			T	/		RESERVATIO			INTEND			SAMPLE	PLIMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL	VOLUME	PRESERVAT	IVE	TOTAL VOL	FI	NAL pH	- ANALYSIS A METHO	ND/OR E	QUIPMENT	FLOW R (mL per m	RATE
EKMW-11	1	CHEMETS	25 mL	NA			2.	76	S2O8 (Pers	sulfate)	APP	~ w	n
EKMW-11	3	AG	40 mL	H2S04			4	し	тос		APP		
EKMW-11	1	PE	250 mL	NONE			25	76	SO42-		APP		
EKMW-11	1	PE	250 mL	HNO3		2	L	2	Sulfur, T		APP		
EKMW-11	2	PE	250 mL	HNO3			2	6	ATS Fe, Mn		APP		
EVIANI	3	CG	Your	He		*		2	VOC		+	141	
REMARKS	Well historica Sodium pers	ally purges dry ulfate tested i	A Purge one ec n field with CH	quipment volun EMETS colorin	ne prior to sa netric tubes.	mpling.S	Dg z	113	a msk	lax di	lette	~).	
MATERIAL	CODES:	AG = Amber	Glass; CG =	- Clear Glass;	PE = Pol	yethylene;	PP = Poly	propyl	ene; <b>S</b> = Silic	one; <b>T</b> = Te	eflon; <b>O</b> =	Other (Speci	ify)
SAMPLING	EQUIPMENT		APP = After Pe RFPP = Revers		altic Pump;	SM = Strav		ubing	Gravity Drain);	ric Submersil <b>0</b> = Othe	ole Pump; r (Specify)		

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units **Temperature**:  $\pm$  0.2 °C **Specific Conductance**:  $\pm$  5% **Dissolved Oxygen**: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity**: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP					Jacksonville, FL				
WELL NO:	EKMW-12			SAMPLE					DATE:	3/10/2	rU
	9				PURC	SING DA	TA			-1-1-	
WELL DIAMETER WELL VOL (only fill out		DIANE	TER (inches):	IM DEF	TH - STA	et to 23 f	O WATER) X	ER (feet): 8	OR E	GE PUMP T BAILER	- PP
EQUIPMEN (only fill out	IT VOLUME P if applicable)	URGE: 1 EQ	= ( UIPMENT VOL	= D a	 UME + (TUE allons + ( <b>0</b>	Inste					100 100 1
	MP OR TUBIN VELL (feet):	G 21		IP OR TUBING WELL (feet):		PURGIN		PURGING ENDED AT:			
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND, (circle units) µmhos/cm or (S/c)n	DISSOLVED OXYGEN (circle units) mol or % saturation	TURBIDITY (NTUs)	COLC (descri	be) (mV)
1122	0.25	0.25	0.03	10.40	5.10	んちょう	4382	0.79	40.2	· Cle	00 136e.
										_	
										2	
				*							
	ACITY (Gallon SIDE DIA. CAI		0.75" = 0.02; Ft.): 1/8" = 0.0	1" = 0.04; 0006: 3/16"		6; 2" = 0.1 1/4" = 0.002				6" = 1.47; = 0.010;	<b>12"</b> = 5.88 <b>5/8"</b> = 0.016
			A Manager and a second	3P = Bladder F	Pump; E	SP = Electric	Submersible Pu		eristaltic Pump		other (Specify)
SAMPLED E	BY (PRINT) / A	FFILIATION		SAMPLER(S)	SAMP			1		T	
AJUMP OR T	2119UNG	n Geo	synter		<u> </u>			SAMPLING INITIATED A	1125	SAMPLIN ENDED	AT: 1145
DEPTH IN V	VELL (feet):	<u>`&amp;l</u>		MATERIAL CO	1	ES	Filtratio	on Equipment-Ty		2	SIZE: <b>().%</b> μm
				)	TUBING		eplaced)	DUPLICATE:	Y	$(\mathbb{N})$	
SAMPLE	# CONTAINERS	MATERIAL CODE		PRESERVATI USED	VE 1	RESERVATIO OTAL VOL D IN FIELD (r	FINAL	INTENDE ANALYSIS A METHO	ND/OR EQ	MPLING UIPMENT CODE	SAMPLE PUM FLOW RATE (mL per minut
KMW-12	1	CHEMETS	25 mL	NA	_		5.10		ulfate)	APP	-102
EKMW-12 EKMW-12	3	AG PE	40 mL 250 mL	H2S04			5,10	TOC SO4 ²⁻		APP	1
KMW-12	1	PE	250 mL	HNO3			27	Sulfur, To	otal	APP	
KMW-12	2	PE	250 mL	HNO3			62	Fe, Mn		APP	
REMARKS:	Well historica	C6 Illy purges dry	Purge one equ	Jipment volum	e prior to sar	npling,	4	VOC	<u>s</u>	APP	N ⁺
		AG = Amber	field with CHE				08	128/1	~ ~ ~ ~		
		CODES: A	APP = After Per FPP = Reverse		PE = Poly B = Bail tic Pump;	er; BP =	<b>PP</b> = Polypropyl Bladder Pump; Method (Tubing	ESP = Electr	ic Submersible <b>O</b> = Other (	e Pump;	Other (Specify)
2.	STABILIZATIO	N CRITERIA	OR RANGE OF	VARIATION O	F LAST THRE	d by Chapte	er 62-160, F.A	.C. (SEE FS 2212	SECTION 3)		
optie	onally, <u>+</u> 0.2	mg/L or <u>+</u> 10	0% (whicheve	er is greater)	ductance: Turbidity:	<u>+</u> 5% Diss all readings	solved Oxyge s < 20 NTU; op	n: all readings ptionally <u>+</u> 5 NT	U or <u>+</u> 10%	(whichever	is greater)
۷در) '	ect "	100,	nslna	Ð					Revision [	Jate: Feb	oruary 12, 200

	NAS JAX EK	TAP					Jacksonville, FL			w	
WELL NO:	EKMW-13B			SAMPLE	ID: EKMV				DATE:	310	3U
					PURC	SING DA	ТА				
WELL DIAMETEF WELL VOL (only fill out		DIAME	TER (inches):	YY DEP		et to 23 f	eet STATIC D TO WATE TO WATER) X feet) X	R (feet): 4.	N 0 TY	URGE PUMP T R BAILER:	- -
only fill out	t if applicable)		JIPMENT VOL	×	UME + (TUE allons + ( 0			BING LENGTH)		CELL VOLUME	~ 0.20
	MP OR TUBIN WELL (feet):			MP OR TUBING WELL (feet):	21		G ED AT: 1318	PURGING ENDED AT:	1329	PURGED	(gallons): 0.4
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	рН (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) (circle units) (circle units) (circle units) (circle units)	TURBIC (NTU:	NTY COLO	
1328	6.25	0.35	0.0->	5.90	4.96	24.55	4034	1.12	YD.	3 Cle	عدا لع
								2			
	12								/		
						-					
						ia i					
/ELL CAP UBING IN	ACITY (Gallor SIDE DIA. CAI	ns Per Foot): 0 PACITY (Gal./	0.75" = 0.02; Ft.): 1/8" = 0.	1" = 0.04; 0006; 3/16"	<b>1.25"</b> = 0.06 = 0.0014;	5; 2" = 0.1 1/4" = 0.002	6; <b>3</b> " = 0.37; 6; <b>5/16"</b> = 0.0		5" = 1.02; 006; 1/	<b>6''</b> = 1.47; /2'' = 0.010;	12" = 5.88 5/8" = 0.016
URGING F		ODES: B	= Bailer; I	<b>BP =</b> Bladder P			Submersible Pun	np; <b>PP =</b> Pe	ristaltic Pu	mp; O = (	Other (Specify)
					CAMD						surge (opeoul))
AMPLED	BY (PRINT) / A	FEILIATION				LING DA		1			, (Speen)
AMPLED		ALL VALUE AND	sunter	SAMPLER(S)			TA	SAMPLING	1335	SAMPLI	
UMP OR T	TUBING WELL (feet):	-[6e0	synter	TUBING MATERIAL CO		ES	FIELD- Filtratio	SAMPLING INITIATED AT FILTERED: O n Equipment Typ	N	> ENDED	
UMP OR T EPTH IN V ELD DECO	TUBING MELL (feet): ONTAMINATIO	DN: PUM		TUBING MATERIAL CC		E(S): E S Y Ø(re	FIELD- Filtratio	FILTERED:	N	> ENDED	NG 1965
A SUMP OR T EPTH IN V ELD DECO SAMP	TUBING WELL (feet):	DN: PUM		TUBING MATERIAL CC		ES	FIELD- Filtratio Placed) N FINAL	FILTERED: OF NUT	De:	Filter S	NG AT: 1965 SIZE:0-15 µm SAMPLE PUM FLOW RATE
AMPLE CODE	TUBING MELL (feet): ONTAMINATIONE LE CONTAINE	DN: PUM ER SPECIFICA		TUBING MATERIAL CC		E(S): Y Ø(re ESERVATIO	FIELD- Filtratio Placed) N FINAL	HUTIATED AT FILTERED: O n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD	D D D/OR	ENDED     FILTER S     N     SAMPLING     EQUIPMENT	NG AT: 1965 SIZE:0.15 µm SAMPLE PUM FLOW RATE (mL per minute
AMPORT SAMP CODE MW-138	TUBING MELL (feet): ONTAMINATION LE CONTAINERS 1 3	DN: PUM ER SPECIFICA MATERIAL CODE	P Y (Å TION VOLUME 25 mL 40 mL	TUBING MATERIAL CC PRESERVATI USED		E(S): Y Ø(re ESERVATIO	FIELD- Filtratio Pplaced) N FINAL nL) FINAL	HUTIATED AT FILTERED: O n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD	D D D/OR	SAMPLING EQUIPMENT CODE	NG AT: 1965 SIZE:0.15 µm SAMPLE PUM FLOW RATE (mL per minute
AMPLE CODE CODE CODE CODE CODE CODE CODE COD	TUBING MELL (feet): ONTAMINATION LE CONTAINE # CONTAINERS 1	DN: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE	P Y (X) XTION VOLUME 25 mL 40 mL 250 mL	TUBING MATERIAL CO PRESERVATI USED NA		E(S): Y Ø(re ESERVATIO	FIELD- Filtratio Pplaced) N FINAL pH GhQG	INTERED: In Equipment Type DUPLICATE: INTENDE ANALYSIS AN METHOD S208 (Persu	D D D/OR	ENDED     FILTER S     N     SAMPLING     EQUIPMENT     CODE     APP	NG AT: 1965 SIZE:0.45 µm SAMPLE PUM FLOW RATE (mL per minute
AMPLE CODE MW-138 MW-138 MW-138 MW-138	TUBING MELL (feet): ONTAMINATION LE CONTAINERS 1 3	DN: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE PE	P Y N TION VOLUME 25 mL 40 mL 250 mL 250 mL	TUBING MATERIAL CC PRESERVATI USED NA H2S04 NONE HNO3		E(S): Y Ø(re ESERVATIO	FIELD- Filtratio pplaced) N FINAL pH 4494	HUTIATED AT FILTERED: O n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD S2O8 (Persu TOC SO4 ²⁻ Sulfur, To	D D D D/OR D Ifate)	<ul> <li>ENDED</li> <li>FILTER S</li> <li>N</li> <li>SAMPLING EQUIPMENT CODE</li> <li>APP</li> <li>APP</li> <li>APP</li> <li>APP</li> </ul>	NG AT: 1965 SIZE:0.15 µm SAMPLE PUM FLOW RATE (mL per minute
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AMPLE CODE MW-13B MW-13B MW-13B MW-13B MW-13B MW-13B	TUBING TUBING WELL (feet): ONTAMINATION THE CONTAINERS 1 3 1 1 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 3 1 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3	DN: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE PE	P Y (N TION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL 250 mL	TUBING MATERIAL CC PRESERVATI USED NA H2S04 NONE HNO3 HNO3		E(S): Y Ø(re ESERVATIO OTAL VOL D IN FIELD (r	FIELD- Filtratio pplaced) N FINAL pH GRAG G G G G G G G G G G G G G G G G G	HUTIATED AT FILTERED: O n Equipment Typ DUPLICATE: ANALYSIS AN METHOD S2O8 (Persu TOC SO4 ²⁻ Sulfur, To Sulfur, To	D N D D D D O O R D O O R I I I I I I I I I I I I I I I I I	<ul> <li>ENDED</li> <li>FILTER S</li> <li>N</li> <li>SAMPLING EQUIPMENT CODE</li> <li>APP</li> <li>APP</li> <li>APP</li> <li>APP</li> </ul>	NG AT: 1965 SIZE:0.15 µm SAMPLE PUM FLOW RATE (mL per minute
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AMPLE CODE CODE CODE CODE CODE CODE CODE COD	TUBING MELL (feet): ONTAMINATION ILE CONTAINERS 1 3 1 1 1 3 1 Well historical Sodium person	DN: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE PE PE PE PE PE	P Y N TION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL 250 mL 250 mL Purge one eq field with CHE	TUBING MATERIAL CC PRESERVATI USED NA H2S04 NONE HNO3 HNO3 UIPMENT volume IMETS colorime	SIGNATURE DDE: PE TUBING SAMPLE PR VE T ADDE CONTROL OF ADDE DDE TUBING SAMPLE PR TUBING SAMPLE PR TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUBING TUB	ESERVATIO OTAL VOL DIN FIELD (r DIN FIELD (r DIN FIELD (r	FIELD- Filtratio	HUTIATED AT FILTERED: On Equipment Type DUPLICATE: INTENDE ANALYSIS AN METHOD S2OB (Persu TOC SO4 ²⁻ Sulfur, To Sulfur, To Fe, Mn	N D D D D D D D D D D D D D	<ul> <li>ENDED</li> <li>FILTER 3</li> <li>N</li> <li>SAMPLING EQUIPMENT CODE</li> <li>APP</li> <li>APP</li> <li>APP</li> <li>APP</li> <li>APP</li> <li>APP</li> </ul>	NG AT: 1965 SIZE:0.45 µm FLOW RATE (mL per minute
AMPLE SAMP AMPLE CODE CODE CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW-138 CMW	TUBING MELL (feet): ONTAMINATION LE CONTAINERS 1 3 1 1 3 Well historice Sodium person CODES: EQUIPMENT (	DN: PUM R SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE PE PE AG AG AG AG AG AG AG AG AG AG	P Y N TION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL 250 mL 250 mL 250 mL Composed FP = After Per FPP = Reverse	TUBING MATERIAL CC PRESERVATI USED NA H2S04 NONE HNO3 HNO3 Uipment volume METS colorime Clear Glass; ristaltic Pump; e Flow Peristalt	SIGNATURE DDE: PI TUBING SAMPLE PR VE ADDE PI ADDE PI ADDE PI PI PI PI PI PI PI PI PI PI	E(S): Y ()(re ESERVATIO OTAL VOL D IN FIELD (r A A A A A A A A A A A A A	FIELD- Filtratio pplaced) N FINAL pH Group Content PH FINAL pH Content Content FINAL pH Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Content Conten	HUTIATED AT FILTERED: On n Equipment Typ DUPLICATE: INTENDE ANALYSIS AN METHOD S208 (Persu TOC S04 ²⁻ Sulfur, To Sulfur, To Fe, Mn VO( S04 ²⁻ Sulfur, To Fe, S = Silicor ESP = Electric Gravity Drain);	N D D D D D D D D D D D D D	ENDED     FILTER     S     N     SAMPLING     EQUIPMENT     CODE     APP     APP     APP     APP     APP     APP     Formattion ()     Code     Code	NG AT: 1965 SIZE:0.15 µm SAMPLE PUM FLOW RATE (mL per minute
AMPLE EPTH IN V IELD DECC SAMP AMPLE CODE (MW-13B (MW-13B (MW-13B (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MW-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B) (MM-13B)	TUBING MELL (feet): ONTAMINATION CONTAINERS 1 3 1 1 3 1 1 3 1 1 5 3 1 1 5 3 1 1 5 5 Well historical Sodium person CODES: EQUIPMENT OF STABILIZATION	DN: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE CG AG = Amber O CODES: A R Io not const N CRITERIA F	P Y N TION VOLUME 25 mL 40 mL 250 mL	TUBING MATERIAL CC PRESERVATI USED NA H2S04 NONE HN03 HN03 Uuipment volume METS colorime Clear Glass; ristaltic Pump; e Flow Peristalt he informatio	SIGNATURE DDE: PI TUBING SAMPLE PR VE ADDE ADDE PI ADDE PI ADDE PI ADDE PI ADDE ADDE ADDE T ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE ADDE	E(S): ESERVATIO OTAL VOL D IN FIELD (r Papling. 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> Collect Field Bup for all except SSDs.

SITE NAME:	NAS JAX EK	TAP					Jacksonville, FL				
	): EKMW-14			SAMPLE						IUL	• )
L					PURC	SING DA	ТА			10/30	
WELL	P (inches)	TUBI		the WE	LL SCREEN	INTERVAL	STATIC D	EPTH UN	< PURG	Ε Ρυμρ τγ	(PEDO
	rk (inches).	DIAM	ETER (inches): DLUME = (TO	TAL WELL DEF		et to 23 1	TO WATER) X			ILER:	PI-
	ut if applicable)		= (	<del>~~~</del>	feet -		feet) X		gallons/foot		gallons
	INT VOLUME P	URGE: 1 EQ	UIPMENT VOL		UME + (TUE		τ <u>γ</u> χ τι	JBING LENGTH)			~0.25
				= () gi	allons + (		ons/foot X Z	feet)	+ 0,132	gallons :	= gallons
	UMP OR TUBIN VELL (feet):			WP OR TUBING WELL (feet):	3 N	PURGIN		PURGING ENDED AT:	1410	OTAL VOL	UME allons): 0,9
		CUMUL.		DEPTH		T T	COND.	DISSOLVED			
TIME	VOLUME PURGED (gallons)	VOLUME PURGED (gallons)		TO WATER (feet)	рН (standard units)	TEMP. ( ^o C)	(circle units) μmhos/cm or μs/cm	OXYGEN (circle units)	TURBIDITY (NTUs)	COLOF (describ	
1415	0.25	0. 25	0.02	تلفا. فا	6.22	24.58	337S	% saturation	18.4	Clec	er - 34.8
		-									
			-							E.	
										-	-
1											
				12							
	PACITY (Gallor NSIDE DIA. CA			1" = 0.04; 0006; 3/16"		6; <b>2"</b> = 0,1 <b>1/4"</b> = 0,002					<b>12''</b> = 5.88 5/8'' = 0.016
PURGING	EQUIPMENT	ODES:	B = Bailer;	<b>BP</b> = Bladder F			Submersible Pur	mp; <b>PP</b> = Pe	eristaltic Pump;	<b>O</b> = Ot	her (Specify)
SAMDI EF	BY (PRINT) / A	FEILIATION		SAMPLER(8)				1			_
A-T	won	160	Runto	SAMPLERUS)				SAMPLING INITIATED AT		SAMPLIN ENDED A	
PUMP OR		1	~ <u>J</u> q	TUBING		ES		FILTERED: R	) N	FILTER SI	
	WELL (feet): CONTAMINATIO		MPY	MATERIAL C		Y RY	eplaced)	DUPLICATE:	pe: Y	N	
	PLE CONTAINE					RESERVATIO		INTENDE		APLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVAT USED	IVE 1	TOTAL VOL	FINAL	ANALYSIS AN METHO	ND/OR EQU		FLOW RATE (mL per minute)
EKMW-14	1_	CHEMETS	25 mL	NA			6.22	S2O8 (Persi	ulfate) /	APP	NUU
EKMW-14	3	AG	40 mL	H2S04			42	тос		APP	
EKMW-14	1	PE	250 mL	NONE	_		6.22	SO42-		APP	
EKMW-14	1	PE	250 mL	HNO3			42	Sulfur, To		APP	
EKMW-14	2	PE	250 mL	HNO3			22	VOC		APP	1 the
REMARKS	Well historica	ally purges dry ulfate tested i	Purge one ec n field with CHI	uipment volum	e prior to sar etric tubes.	npling. Sy	08 2 0.	14	<u>,</u>	AP	V~
MATERIA	CODES:	AG = Amber	Glass; CG =	Clear Glass;	PE = Poly	ethylene;	PP = Polypropyle	ene; <b>S</b> = Silico	ne; <b>T</b> = Teflo	n; <b>0</b> = 0	ther (Specify)
		CODES:	APP = After Pe RFPP = Revers	ristaltic Pump;	B = Bai	ler; BP =	Bladder Pump; Method (Tubing	ESP = Electri	ic Submersible <b>O</b> = Other (S	Pump;	(22201)
OTES: 1	The above (						er 62-160. F.A		- (-	,	

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbldity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

	EKMW-11	1			DIIDO	SING DA	ТΔ		DATE: 0	- 1 - 1	
WELL		TUBING	1	. WEI	LL SCREEN		STATIC	DEPTH	PU	RGE PUMP 1	TYPE
DIAMETER	R (inches): 2	DIAMET	ER (inches):	1/4 DEP	PTH: 19 fe	et to 23 f	eet TO WATE	ER (feet): 4	70 OR	BAILER:	
		1 WELL VOL	UME = (TOT)	AL WELL DEP	PTH – STA	TIC DEPTH 1	O WATER) X	WELL CAPAC	TY		
	t if applicable)		= (	-	feet –	-	feet) X		gallons/fo		-
	NT VOLUME PU t if applicable)	JRGE: 1 EQU	IPMENT VOL.	= PUMP VOL	UME + (TUB	SING CAPACI	TY X T	UBING LENGTH	+ FLOW C	ELL VOLUME	3.0%
(only nil ou	( in applicable)	19.2	1.77	= 🤶 ga	allons + ( 🗢	. 00 20 gallo	ons/foot X 2	3 feet	+ 2.32	gallons	= 0.2
	WELL (feet):	GZI	FINAL PUM	P OR TUBINO VELL (feet):	3 Z1	PURGIN	ED AT: 132	PURGING ENDED AT:	1328	TOTAL VO	
- DEF III II		CUMUL.		DEPTH	,		COND.	DISSOLVED			
TIME	VOLUME PURGED (gallons)	VOLUME PURGED (gallons)	PURGE RATE (gpm)	TO WATER (feet)	pH (standard units)	TEMP. (°C)	(circle units) µmhos/cm or µS/cm	OXYGEN (circle units) mg/P or % saturation	TURBIDI (NTUs)		
1328	0.23	0.75	0.04	8.31	2:97	25.30	10,380	0.78	19.5	LEA	7 5
									1		
											- 3
	· · · ·							,			
1											
			12	10							
						1					
1			3. ×				1 82 I				
				1.1		1 E E			54		
	PACITY (Gallon	Der Feet): 1	75" - 0.02:	<b>1</b> " = 0.04;	<b>1.25</b> " = 0.0	6; <b>2</b> " = 0.1	6; <b>3</b> " = 0.37;	<b>4</b> " = 0.65;	<b>5" = 1.02</b> ;	<b>6</b> " = 1.47;	<b>12</b> " = 5.
	SIDE DIA. CA									2" = 0.010;	<b>5/8"</b> = 0.
		ODES. D	= Bailer; I	BP = Bladder F			Submersible Pu	mp; <b>PP</b> = Pe	eristaltic Pur	np; <b>O</b> = 0	Other (Spe
PURGING	EQUIPMENT O	ODES. B		1	SAMP		ΔΤΔ				
Ъ.,				SAMPIER S							
Ъ.,	BY (PRINT) / A	AFFILIATION:		SAMPLER(S)					BB	SAMPLI	
Ъ.,	BY (PRINT) / A	AFFILIATION:	CSYNTEC	TUBING	SIGNATUR	(S):		SAMPLING INITIATED AT		ENDED	AT:13
SAMPLED	BY (PRINT) / A	AFFILIATION:	1		ODE: 7	(S): E, J	FIELD	-FILTERED	N N	FILTER S	AT:13
SAMPLED	BY (PRINT) / A	AFFILIATION:			ODE: 7 TUBING	τ(S): 	FIELD Filtration Filtration	FILTERED	) N	ENDED	AT: 13
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI	BY (PRINT) / A APDHA TUBING WELL (feet): CONTAMINATIO	AFFILIATION: 21 ON: PUM ER SPECIFICA	P Y N	TUB <b>W</b> G MATERIAL C	ODE: 7 TUBING	Y NUR	FIELD Filtrati Pplaced) N	INITIATED AT FILTERED: Y on Equipment Ty DUPLICATE: INTENDE	N De: Y	FILTER S	AT: 1 3 4 SIZE: <u>.4</u> SAMPI
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI	BY (PRINT) / A ABHA TUBING WELL (feet): CONTAMINATIO PLE CONTAINE #	AFFILIATION: 2 DN: PUM	P Y N		ODE: 7 TUBING SAMPLE PF	τ(S): 	FIELD Filtratii Pplaced) N FINAL	-FILTERED: Y on Equipment Ty DUPLICATE:	N De: Y ED S ND/OR E	FILTER S	AT: ( ) SIZE: <u>.4</u> .
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI	BY (PRINT) / A APDHA TUBING WELL (feet): CONTAMINATIO	AFFILIATION: 21 ON: PUM ER SPECIFICA MATERIAL		TUB <b>IN</b> G MATERIAL C	ODE: 7 TUBING SAMPLE PF	Y NG RESERVATIC	FIELD Filtratii Pplaced) N FINAL	INITIATED A -FILTERED: Y on Equipment Ty DUPLICATE: INTENDE ANALYSIS A	N De: Y ED Y ND/OR E D	FILTER S	AT: 1 3 4
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI SAMPLE ID CODE	BY (PRINT) / A AB HA TUBING WELL (feet): CONTAMINATION PLE CONTAINERS	AFFILIATION: 2 ON: PUM ER SPECIFICA MATERIAL CODE	P Y N TION VOLUME	TUB <b>W</b> G MATERIAL C PRESERVAT USED	ODE: 7 TUBING SAMPLE PF	Y NG RESERVATIC	FIELD Filtrati Pplaced) N mL) FINAL pH	INITIATED AT -FILTERED: Y on Equipment Ty; DUPLICATE: INTENDE ANALYSIS AI METHO	N De: Y ED Y ND/OR E D	FILTER S	AT: ( ) SIZE: <u>4</u> SAMPI FLOV (mL pe
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI SAMPLE ID CODE EKMW-11	BY (PRINT) / A ABDHA TUBING WELL (feet): CONTAMINATIO PLE CONTAINERS CONTAINERS 1	AFFILIATION: 2 0N: PUM ER SPECIFICA MATERIAL CODE CHEMETS	P Y N TION VOLUME 25 mL	TUBLING MATERIAL C PRESERVAT USED NA	ODE: 7 TUBING SAMPLE PF	Y NG RESERVATIC	FIELD Filtrati Pplaced) N mL) FINAL pH	INITIATED AT FILTERED Ty on Equipment Ty DUPLICATE: INTENDE ANALYSIS AI METHO S208 (Pers	N De: Y ED Y ND/OR E D	FILTER S	AT: ( ) SIZE: .4 SAMPI FLOV (mL pe
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMPLE ID CODE EKMW-11 EKMW-11	BY (PRINT) / A ABCHA TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3	AFFILIATION: 2 0N: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG	P Y N TION VOLUME 25 mL 40 mL	TUBLWG MATERIAL C PRESERVAT USED NA H2S04	ODE: 7 TUBING SAMPLE PF	Y NG RESERVATIC	FIELD Filtrati Pplaced) N mL) FINAL pH - 2	INITIATED AT FILTERED Y on Equipment Ty DUPLICATE: INTENDE ANALYSIS AI METHO S2O8 (Pers TOC	D N D Y D/OR E D Ulfate)	SAMPLING QUIPMENT CODE APP APP	AT: ( ) SIZE: .4 SIZE: .4 FLOV (mL pe
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI SAMPLE ID CODE EKMW-11 EKMW-11 EKMW-11	BY (PRINT) / A ABCHA TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1	AFFILIATION: 2 0N: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE	P Y N TION VOLUME 25 mL 40 mL 250 mL	TUBLWG MATERIAL C PRESERVAT USED NA H2S04 NONE	ODE: 7 TUBING SAMPLE PF	Y Wigh RESERVATION TOTAL VOL DIN FIELD (	FIELD Filtration Piltration FINAL PH C C C C C C C C C C C C C C C C C C	INITIATED AT FILTERED Ty on Equipment Ty DUPLICATE: INTENDE ANALYSIS A METHO S208 (Pers TOC S042- Sulfur, To Fe, Mn	D N D Y D SE D SE	APP APP APP	AT: ( ) SIZE: .4 SIZE: .4 FLOV (mL pe
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMI SAMPLE ID CODE EKMW-11 EKMW-11 EKMW-11	BY (PRINT) / A ABDHA TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1 1 3	AFFILIATION: 2 0N: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE	P Y N TION VOLUME 25 mL 40 mL 250 mL 250 mL	TUBLING MATERIAL C PRESERVAT USED NA H2S04 NONE HNO3	ODE: 7 TUBING SAMPLE PF	S): Y (L) RESERVATION TOTAL VOL D IN FIELD (	FIELD Filtration Piltration FINAL PH C C C C C C C C C C C C C C C C C C	INITIATED AT FILTERED Ty on Equipment Ty DUPLICATE: INTENDE ANALYSIS A METHO S208 (Pers TOC S042- Sulfur, To Fe, Mn	D N D Y D SE D SE	APP APP APP	AT: ( ) SIZE: .4 SIZE: .4 FLOV (mL pe
SAMPLED PUMP OR DEPTH IN FIELD DEC SAMPLE ID CODE EKMW-11 EKMW-11 EKMW-11 EKMW-11 EKMW-11	BY (PRINT) / A ADDHA TUBING WELL (feet): CONTAMINATION PLE CONTAINERS 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1	AFFILIATION: 2 CN: PUM ER SPECIFICA MATERIAL CODE CHEMETS AG PE PE PE PE	P Y N TION VOLUME 25 mL 40 mL 250 mL 250 mL 250 mL 250 mL 1 c Purge one eq	PRESERVAT USED NA H2S04 NONE HNO3 1/	CODE: 7 TUBING SAMPLE PF IVE ADDE	S): Y Wi RESERVATION TOTAL VOL D IN FIELD (	FIELD Filtration Piltration FINAL PH C C C C C C C C C C C C C C C C C C	INITIATED AT FILTERED Ty on Equipment Ty DUPLICATE: INTENDE ANALYSIS AI METHO S208 (Pers TOC S04 ²⁻ Sulfur, To Fe, Mn Fe, Mn	D N D Y D SD ND/OR E D ulfate) D D D D D D D D D D D D D	APP APP APP	AT: ( ) SIZE: .4 SIZE: .4 FLOV (mL pe

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK T	AP	1.2	- Constant of the	SI LO		Jackson	nville, FL	205	er dere		160	1.1
WELL NO:	EKMW-12	3 J. J. J. 19	1.1.2	SAMPLE ID	EKMV	V-12		32		DATE:	3/24	2020	
1					PURG	SING DA	TA	1				1	
WELL		TUBING	TER (inches):	14 DEPTH	: 19 fe	INTERVAL et to 23 1	feet	STATIC DE	R (feet): 3.4	0 0			^{re} PP
WELL VOL (only fill out	UME PURGE: t if applicable)	1 WELL VOL	UME = (TOT) = (	AL WELL DEPTH	– STA			TER) X feet) X	WELL CAPAC	ITY gallons/		_	gallons
EQUIPMEN (only fill out	NT VOLUME PU t if applicable)	RGE: 1 EQU		. = PUMP VOLUN	IE + (TUB	ING CAPAC	ITY	X TU	BING LENGTH	l) + FLOW (	CELL VOI	LUME allons =	×3=
	MP OR TUBING	2		P OR TUBING	ns + ( 0.			1 23	PURGING	1)+ 0.132	-		
	WELL (feet):	21		WELL (feet):	21			1400	ENDED AT:	1409		AL VOLU GED (ga	
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH standard units)	TEMP. (°C)	(circ µm)	OND. le units) hos/cm µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIC (NTU		COLOR	
4409	0.25	0.25	0.03	6.62 3	5.47	26.64	46	31	5.88	26.9	• •	Euro	100.2
		Cas d										TINT	
		S. N. 19					-				-		
1		-											-
1.376			100		1		-						
		- 2	-		4		-	1		1.			
1.11	10	100			1			-					
		1.37	Sec. 1										plan, a
			1.5	1.0				5	× 9	1.10		85	5 6
			5 A.C. 14		93 - S.		8	191					
	PACITY (Gallon NSIDE DIA. CAI			1" = 0.04; 1 .0006; 3/16" =		6; <b>2</b> " = 0. <b>1/4</b> " = 0.00		3" = 0.37; 5/16" = 0.0	<b>4</b> " = 0.65; 04; <b>3/8</b> " =	<b>5</b> " = 1.02; 0.006; 1	6" = 1 1/2" = 0.0		2" = 5.88 8" = 0.016
PURGING	EQUIPMENT	ODES: E	8 = Bailer;	BP = Bladder Pur		SP = Electric			np; <b>PP</b> = F	Peristaltic P	ump;	O = Oth	er (Specify)
		FEILIATION.	. 7 7			LING D	ΑΤΑ			5.5			1
SAMPLED		/	STATEC	SAMPLER(SI 8	SHOR	elsy	1		SAMPLING	T: 14-14		MPLING	
PUMP OR	TUBING	/	Sprice	TUBING	yre"	5,5	in de		FILTERED:	5 N			E: <u>.45</u> μm
	WELL (feet):	21		MATERIAL COL		-	replace		n Equipment T			2	- 10. F
	CONTAMINATIO		<u> </u>		TUBING			a)	DUPLICATE		Ň	<u> </u>	
SAMPLE	PLE CONTAINE # CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIV	E	RESERVATIO		FINAL pH	INTEND ANALYSIS / METHO	AND/OR	SAMPL EQUIPN COD	IENT	SAMPLE PUMP FLOW RATE (mL per minute)
ID CODE EKMW-12	1	CHEMETS	25 mL	NA		-		-	S2O8 (Per	sulfate)	APF	>	
EKMW-12	3	AG	40 mL	H2S04		-		42	тос		APF		~100
EKMW-12	1	PE	250 mL	NONE				5.47	SO42	•	APP	2	4 200
EKMW-12	1	PE	250 mL	HNO3		-	11	42	Sulfur,	Total	AP	P	1.1
EKMW-12	1	PE	250 mL	HNO3	8	-		1		n TOTAL	APF	>	1
••	5	11	11					T	FEMN	FILTER	>		Y
REMARKS	S: Well historic Sodium pers	ally purges dry ulfate tested i	y. Purge one e n field with CH	quipment volume EMETS colorimet	ric tubes.			SULFATE		1	. 021g		e de la composition de la comp
MATERIA		AG = Amber		= Clear Glass;		yethylene;		Polypropyl			= Teflon;		her (Specify)
SAMPLIN	G EQUIPMENT			eristaltic Pump; se Flow Peristaltic	B = Ba Pump;			der Pump; od (Tubing	ESP = Elec Gravity Drain);		ther (Spec		
	<b>T</b> 1			the informatio					. ,.				

 NOTES:
 1. The above do not constitute all of the information required by chapter 62-160, 1.A.O.

 2.
 Stabilization Criteria For Range of Variation of Last three Consecutive Readings (see FS 2212, section 3)

+ VOC'

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР		1		OCATION:	cksonville, FL	and a			
	EKMW-13B		100	SAMPL	EID: EKN	IW-13B	1.12		DATE:	03/24/2	
					PUR	GING DAT	A			5/24/2	
WELL	R (inches): 2	TUBIN	TER (inches):	14 DE	ELL SCREEN	N INTERVAL feet to 23 fee	STATIC D	ER (feet): 3.	,0 0	URGE PUMP T R BAILER:	YPE 77
(only fill out	UME PURGE: t if applicable)	1 WELL VO	LUME = (TOT = (	AL WELL DE	feet - SI	ATIC DEPTH TO	feet) X			foot = -	gallons
EQUIPMEN (only fill out	NT VOLUME PU t if applicable)	JRGE: 1 EQI	JIPMENT VOL		UME + (TU	JBING CAPACIT			) + FLOW (	CELL VOLUME	¥3= 0.6 =0.2 gallons
	IMP OR TUBING	^G 21		MP OR TUBIN WELL (feet):		PURGING		PURGING		TOTAL VO	
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm	DISSOLVED OXYGEN (circle units) mg/l_or % saturation	TURBID (NTU:		
1447	0.25	0.25	6.03	7.15	25.90	45.13	4124	0.25	APX8 &	and ut	AR 139.7
						-					
				5							
					-						-
											1 1 1
							N				
1.4		1.00		1.			1 B				
TUBING IN	ACITY (Gallon ISIDE DIA. CAI EQUIPMENT C	PACITY (Gal.	<b>0.75</b> " = 0.02; /Ft.): <b>1/8</b> " = 0 <b>B</b> = Bailer;	1" = 0.04; .0006; 3/10 BP = Bladder	<b>5"</b> = 0.0014; Pump;	1/4" = 0.0026 ESP = Electric S	5/16" = 0. ubmersible Pu	.004; 3/8" = 0	eristaltic Pu	<b>2"</b> = 0.010; mp: <b>O</b> = 0	<b>12"</b> = 5.88 <b>5/8"</b> = 0.016 Other (Specify)
	BY PRINT /		1	SAMPLER(	SAM	PLING DA	IA		145 z		10
SAMPLED	IK	/	GEGSTNEC		15	L		SAMPLING INITIATED A	T: 1929	ENDED	
PUMP OR		21		TUBING MATERIAL		PES		-FILTERED: Y		FILTER S	SIZE: <u>·9.5</u> μm
		enter anteres	MP Y (	1	TUBING	Y Rrep	laced)	DUPLICATE:	$\overline{\mathbb{Y}}$	Ν	
SAMP	LE CONTAINE	R SPECIFIC	ATION	ried	SAMPLE	PRESERVATION				SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE •	VOLUME	PRESERVA		TOTAL VOL DED IN FIELD (m	FINAL L) pH	ANALYSIS A METHO		EQUIPMENT	FLOW RATE (mL per minute
EKMW-13B	1	CHEMETS	25 mL	NA		-	-	S2O8 (Pers	ulfate)	APP	
EKMW-13B	3	AG	40 mL	H2S04		-	42	тос		APP	N10G
EKMW-13B	1	PE	250 mL	NONE		-	5.13	SO42-		APP	6200
EKMW-13B	1	PE	250 mL	HNO3		-	62	Sulfur, To		APP	
EKMW-13B	1	PE	250 mL	HNO3		<u> </u>			, TOTAL	APP	
10	Ń	~	••	11			~		FELTÉRES		4
REMARKS			y. Purge one each of the second se		metric tubes		PERSNER		mg)_		
MATERIAL		AG = Amber	Glass; CG	= Clear Glass	PE = Po	Siyearyrener	P = Polypropyl	ana a	one; T = "		Other (Specify)
SAMPLING	G EQUIPMENT		APP = After Pe RFPP = Rever			SM = Straw N	ladder Pump; Method (Tubing	ESP = Electr Gravity Drain);		ible Pump; er (Specify)	

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C. 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

14065

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

NAME:       Indext and the second secon	gallons x.3 204 D-2 gallons
PURGING DATA         WELL DIAMETER (inches):       TUBING DIAMETER (inches):       TUBING DIAMETER (inches):       Well SCREEN INTERVAL DEPTH:       STATIC DEPTH TO WATER (feet):       PURGE PUMP TYPE OR BAILER:         WELL VOLUME PURGE:       1       WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER)       X       Well CAPACITY         (only fill out if applicable)       = (       feet -       feet)       X       gallons/foot =         EQUIPMENT VOLUME PURGE:       1       EQUIPMENT VOL.       = PUMP VOLUME + (TUBING CAPACITY       X       TUBING LENGTH) + FLOW CELL VOLUME         (only fill out if applicable)       =       gallons + (o.ow2c gallons/foot X       feet) + · (7z gallons = C       gallons = C         INITIAL PUMP OR TUBING DEPTH IN WELL (feet):       Z       I       FINAL PUMP OR TUBING DEPTH IN WELL (feet):       Z       PURGING INITIATED AT:       PURGING ENDED AT:       TOTAL VOLUME PURGED (gallons)         TIME       VOLUME PURGED       CUMUL. (gallons)       DEPTH (feet)       pH VOLUME (feet)       TEMP. (feet)       COND. O' (S'Cm)       DISSOLVED OXYGEN (circle units)       TURBIDITY (NTUs)       COLOR (describe)	APP gallons x.3 = 0.4 gallons ME ons): ORP
WELL       TUBING       WELL SCREEN INTERVAL       STATIC DEPTH       PURGE PUMP TYPE         DIAMETER (inches):       2       DIAMETER (inches):       '4       DEPTH: 19 feet to 23 feet       TO WATER (feet):       4.20       OR BAILER:         WELL VOLUME PURGE:       1       WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER)       X       WELL CAPACITY       OR BAILER:         WELL VOLUME PURGE:       1       WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER)       X       WELL CAPACITY       OR BAILER:         Convertion       = (       feet -       feet)       X       gallons/foot       =       -         EQUIPMENT VOLUME PURGE:       1       EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY       X       TUBING LENGTH) + FLOW CELL VOLUME         (only fill out if applicable)       =       gallons + (TUBING CAPACITY       X       TUBING LENGTH) + FLOW CELL VOLUME         INITIAL PUMP OR TUBING       E       FINAL PUMP OR TUBING       E       PURGING       PURGING       TOTAL VOLUME         DEPTH IN WELL (feet):       Z       I       FINAL PUMP OR TUBING       Z       PURGING       PURGING       TOTAL VOLUME         TIME       VOLUME       CUMUL.       PURGE       DEPTH       TO       MITIAL PUMP OR TUBING       INTITATED AT: IS IN (COND.	APP gallons x.3 = 0.4 gallons ME ons): ORP
(only fill out if applicable)         EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME         (only fill out if applicable)         = ( feet - feet) X - gallons/foot = -         TUBING LENGTH) + FLOW CELL VOLUME         (only fill out if applicable)         = gallons + ( colspan="2">Ower C gallons/foot X         INITIAL PUMP OR TUBING DEPTH IN WELL (feet):       Z 1       PURGING INITIATED AT: IS S       PURGING ENDED AT:       TOTAL VOLUM PURGED (gallon)         VOLUME       CUMUL. VOLUME       PURGE       DEPTH TO TO (gallons)       DEPTH PH (feet)       TEMP. (feet)       COND. (circle units)       DISSOLVED OXYGEN (circle units)       TURBIDITY (NTUs)       COLOR (describe)	AE Ors): ORP
INITIAL PUMP OR TUBING DEPTH IN WELL (feet):       Z I       FINAL PUMP OR TUBING DEPTH IN WELL (feet):       Z I       PURGING INITIATED AT:       PURGING ENDED AT:       PURGING ENDED AT:       TOTAL VOLUM PURGED (gallons)         TIME       VOLUME (gallons)       CUMUL. VOLUME (gallons)       PURGE DEPTH IN WELL (feet):       DEPTH TO (gallons)       DEPTH TO (feet)       PURGING INITIATED AT:       PURGING ENDED AT:       TOTAL VOLUM PURGED (gallons)	D· 2 gallons ME pons): ORP
DEPTH IN WELL (reet):     Z 1     DEPTH IN WELL (reet):     Z 1     INITIATED AT:     ISSOLVED       TIME     VOLUME PURGED (gallons)     CUMUL. VOLUME (gallons)     PURGE PURGED (gallons)     DEPTH IN WELL (reet):     Z 1     INITIATED AT:     ISSOLVED (circle units)     PURGED OXYGEN (°C)     PURGED (circle units)     PURGED OXYGEN (circle units)     PURGED (NTUS)     PURGED (describe)	ons): ORP
TIME     VOLUME     VOLUME     PURGE     TO     pH     TEMP.     Correl units)     OXYGEN     TURBIDITY     COLOR       YOLUME     PURGED     RATE     WATER     (standard units)     (°C)     µmhos/cm     (circle units)     TURBIDITY     COLOR     (describe)       (gallons)     (gallons)     (gpm)     (feet)     units)     0     0     Y     Y     Y     Y     COLOR     (describe)	
1535 0.27 0.25 0.04 7.74 0.15 25.03 3428 0.78 HANN CLEAR	
Image: Sector of the sector	-56.0
	1.11
	" = 5.88
	" = 0.016
SAMPLING BATA	r (Specify)
SAMPLED BY (PRINT) / AFFILIATION: SAMPLER(S) SIGNATURE STATUS	1555
PUMP OR TUBING ZI TUBING PER FIELD-FILTERED: (Y) N FILTER SIZE	. • <b>9</b> _μm
DEPTH IN WELL (feet):     MATERIAL CODE:     Image: Comparing the second	
SAMPLE # MATERIAL VOLLINE PRESERVATIVE TOTAL VOL FINAL ANALYSIS AND/OR EQUIPMENT	FLOW RATE mL per minute)
EKMW-14 1 CHEMETS 25 mL NA S208 (Persulfate) APP -	_
	100
EKMW-14 1 PE 250 mL NONE - 6.15 SO42- APP -	2200
EKMW-14         1         PE         250 mL         HNO3	
EKMW-14 1 PE 250 mL HN03 Fe, Mn , TOTA APP	
REMARKS: Well historically purpes day. Purpe one equipment volume prior to compling	v
REMARKS: Well historically purges dry. Purge one equipment volume prior to sampling. Sodium persulfate tested in field with CHEMETS colorimetric tubes.	
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other	
SAMPLING EQUIPMENT CODES:       APP = After Peristaltic Pump;       B = Bailer;       BP = Bladder Pump;       ESP = Electric Submersible Pump;         RFPP = Reverse Flow Peristaltic Pump;       SM = Straw Method (Tubing Gravity Drain);       O = Other (Specify)         IOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.	er (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	TAP				TE CATION: J	acksonville, FL				
WELL NO	EKMW-11			SAMPLE	ID: EKMV	V-11			DATE:	4107 120	20
					PURC	SING DA	ТА			11 1 1 2	
	R (inches): 2	DIAN	ETER (inches):			et to 23 f		ER (feet):	OF	JRGE PUMP T R BAILER:	YPE PP
(only fill ou	ut if applicable)		= (		feet –		feet) X		gallons/f		gallons
	NT VOLUME P ut if applicable)	URGE: 1 EQ	UIPMENT VO		,	BING CAPACI		UBING LENGTH ろひ feet			= 0.2( gallons
	UMP OR TUBIN I WELL (feet):	G 21		MP OR TUBIN		DUDOIN		DUDOINO		TOTAL VOI	
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or	DISSOLVED OXYGEN (circle units) mg/2 or % saturation	TURBID (NTUs		R ORP
12:46	0.25	0.25	0.08	6.35	3.20	25.54	9935	0.95	29.	O clea	r 531.5
										-	
		<u> </u>									
									-		
									-		
											-
									-		
						l					
	PACITY (Gallor NSIDE DIA, CA			<b>1"</b> = 0.04; .0006; <b>3/16</b>	<b>1.25"</b> = 0.0 ' = 0.0014;	6; <b>2"</b> = 0.1 <b>1/4"</b> = 0.002			<b>5''</b> = 1.02; 0.006; <b>1</b> /	<b>6"</b> = 1.47; / <b>2"</b> = 0.010;	<b>12"</b> = 5.88 <b>5/8"</b> = 0.016
PURGING	EQUIPMENT	ODES:	3 = Bailer;	BP = Bladder			Submersible Pu	imp; PP = P	eristaltic Pu	imp; <b>O</b> = C	ther (Specify)
01101 55		FFILLATION.				LING DA					
Byu	BY (PRINT) / A	the second states of the second states				zuf		SAMPLING INITIATED A			AT: 13:16
PUMP OR DEPTH IN	TUBING WELL (feet):	2	-1	TUBING		PE,S		-FILTERED: Y		FILTER S	IZE: <mark>0. 4</mark> 5μm
	CONTAMINATIO	DN: PU	MP Y 👩		TUBING		placed)	DUPLICATE		N	
SAM	PLE CONTAINE	R SPECIFIC	ATION		SAMPLE PF	RESERVATIO	N	INTEND		SAMPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVAT USED		FOTAL VOL D IN FIELD (I	mL) pH	ANALYSIS A METHO		EQUIPMENT CODE	FLOW RATE (mL per minute)
EKMW-11	1	CHEMETS	25 mL	NA			-	S2OB (Per	sulfate)	APP	~ 300
EKMW-11	3	AG	40 mL	H2S04		-	-	тос		APP	e 100
EKMW-11	1	PE	250 mL	NONE		-	-	SO42-		APP	~ 300
EKMW-11	1	PE	250 mL	HNO3			-	Sulfur, T	otal	APP	~ 300
EKMW-11	12	PE	250 mL	HNO3		-		Disso Fe, Mr	1	APP	~ 300
EKMW-1	3	C6	Yome	Hel		-	-	VOC		APP	c100
REMARKS	eren matorio			quipment volun EMETS colorin		mpling.	\$208 · 2	5 g/L (+	800 · 1 0	uwtw~)	
MATERIA	L CODES:	AG = Amber	Glass; CG	= Clear Glass;	PE = Poly	vethylene;	PP = Polypropy	lene; <b>S</b> = Silic	one; T = T	Teflon; O = (	Other (Specify)
SAMPLIN	G EQUIPMENT			eristaltic Pump; se Flow Perista			Bladder Pump; Method (Tubing	<b>ESP</b> = Elect Gravity Drain);	tric Submers 0 = Oth	sible Pump; her (Specify)	
OTES: 1.	The above	do not cons	stitute all of	the informat	ion require	d by Chapt	er 62-160, F.A	A.C.			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР			SI LC		lacksonville, FL				
	EKMW-12			SAMPLE II					DATE: 4/0	07/202	0
à					PURG	ING DA	ТА			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	R (inches): 2	DIANE	ETER (inches):	1/4 DEPT	H: 19 fe	NTERVAL et to 23 f		ER (feet) 3	3 6 OR B	GE PUMP T AILER:	YPE PP
	LUME PURGE: ut if applicable)	1 WELL VO	DLUME = (TO	TAL WELL DEPTI	H – STA	TIC DEPTH T	OWATER) X	WELL CAPAC	ITY		
FOUIPME				L. = PUMP VOLU	eet – MF + /TUB		feet) X	UBING LENGTH	gallons/foot		gallons
	ut if applicable)				,						
INITIAL P	UMP OR TUBIN	IG	FINAL PU	- C gain MP OR TUBING		PURGIN	0	BUDOINO	)+0.132	TOTAL VOI	= 0.2 gallons
	WELL (feet):	21		WELL (feet):	21	INITIATE	ED AT: 13:34	ENDED AT:	13:37	PURGED (g	gallons): 0 . 25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. ( ^o C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) mg/D or % saturation	TURBIDITY (NTUs)	COLO (describ	
13:37	0.25	0.25	0.08	4.90	5.15	26.72	4105	1.45	27.2	dear	- 97.2
		1							<i>.</i>		
		-								_	
							E.				
			-								
			_								
	PACITY (Gailon NSIDE DIA. CAI				<b>.25</b> " = 0.06	5; <b>2"</b> = 0.1 <b>1/4"</b> = 0.002				" = 1.47; = 0.010;	<b>12"</b> = 5,88 <b>5/8"</b> = 0.016
	EQUIPMENT O		B = Bailer;	BP = Bladder Pu			Submersible Pu		eristaltic Pump		ther (Specify)
						LING DA	TA				
	BY (PRINT) / A		essynte	SAMPLER(S) S		E(S): - 2,0	A	SAMPLING INITIATED A	T: 13:45	SAMPLIN ENDED A	IG AT: 14:00
PUMP OR	TUBING WELL (feet):		21	TUBING MATERIAL COL	E PE	0	/ FIELD	-FILTERED:	2 N	FILTER S	IZE <u>0.45</u> μm
		ON: PU	AP Y /	-			placed)	DUPLICATE:	1.5.5	N	
SAM	PLE CONTAINE	ER SPECIFIC			AMPLE PR	ESERVATIO		INTEND	ED SA	MPLING	SAMPLE PUMP
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIV	E T	OTAL VOL D IN FIELD (I	FINAL	ANALYSIS A METHO	ND/OR EQ	UIPMENT CODE	FLOW RATE (mL per minute)
EKMW-12	1	CHEMETS	25 mL	NA			-	S2O8 (Pers	ulfate)	APP	~ 300
EKMW-12	3	AG	40 mL	H2S04		_	-	тос		APP	c 100
EKMW-12	1	PE	250 mL	NONE		-	-	SO42-		APP	~ 300
EKMW-12	1	PE	250 mL	HNO3		- <b>-</b>	-	Sulfur, T		APP	~ 300
EKMW-12	12	PE	250 mL	HNO3	_		-	Fe, Mn	(Dissplued		~ 300
EKMW-12		CG	40 ml	HCI				VOC	2	APP	L /00
REMARKS	weir matorica			quipment volume EMETS colorimet		npling. S	208:0.7	mg/L			
MATERIA	CODES	AG = Amber	Glass; CG	= Clear Glass;	PE = Poly	ethylene;	PP = Polypropy	lene; S = Silico	one; T = Tefl	on; <b>O</b> = C	Other (Specify)
_	G EQUIPMENT		RFPP = Rever	eristaltic Pump; se Flow Peristaltic		SM = Straw	Bladder Pump; Method (Tubing	Gravity Drain);	ric Submersible <b>0</b> = Other (		
OTES: 1.	The above of	do not cons	titute all of	the information	n require	d by Chapt	er 62-160, F.A	.C.			

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE N NAME: N	IAS JAX EK	ТАР			SI		acksonville, FL				
WELL NO: E	EKMW-13B			SAMPLE	EID: EKMV			I		1071202	0
	_				PURG	SING DA	ГА				
	ME PURGE:		TER (inches)	: 1/4   DEI		et to 23 fe		EPTH R (feet): 3 . 1 WELL CAPACI	32 0	urge pump t R Bailer:	PPE PP
ONLY fill out if a QUIPMENT only fill out if a	VOLUME PL	JRGE: 1 EQ	= ( UIPMENT VO	L. = PUMP VO			<u>2</u>	IBING LENGTH)		CELL VOLUME	gallons
ITIAL PUMP EPTH IN WE	P OR TUBING	G 21		IMP OR TUBIN		PURGIN		PURCINC	14:23		
	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µs/cm	DISSOLVED OXYGEN (circle units) pg// or % saturation	TURBIE (NTU		R ORP
4:22	0.25	0.25	0.08	4.82	5.37	26.70	3748	0.98	9.6	2 clean	- 93.9
UBING INSI		ACITY (Gal.	0.75" = 0.02; /Ft.): 1/8" = ( 3 = Bailer;		" = 0.0014;	6; <b>2"</b> = 0.16 1/4" = 0.0020 SP = Electric :		004; <b>3/8"</b> = 0.	5" = 1.02; 006; 1 ristaltic Pu	/2" = 0.010;	<b>12</b> " = 5.88 <b>5/8</b> " = 0.016 Other (Specify)
						LING DA	TA				
	(PRINT) / A		Georgal	SAMPLER(S	SIGNATURE	(s): 2/1	1	SAMPLING INITIATED AT	14:3	0 SAMPLIN ENDED	NG 15:00
IMP OR TUI	BING	0	21	TUBING MATERIAL C	ODE	PE, S	FIELD-	FILTERED: 8	N	FILTER S	GIZE: <u>0. 45</u> μm
					TUBING		placed)	DUPLICATE:	De.	N	
SAMPLE		R SPECIFIC			SAMPLE PR	ESERVATIO	- 19	INTENDE		SAMPLING	SAMPLE PUMP
MPLE CODE CO	# ONTAINERS	MATERIAL CODE	VOLUME	PRESERVAT USED		OTAL VOL D IN FIELD (n	FINAL nL) pH	ANALYSIS AN METHOU		EQUIPMENT CODE	FLOW RATE (mL per minute)
MW-13B	1	CHEMETS	25 mL	NA		-	· •••	S2O8 (Persu	ulfate)	APP	~ 300
(MW-13B	3	AG	40 mL	H2S04		-	-	тос		APP	2100
(MW-13B	1	PE	250 mL	NONE		_	_	SO42-		APP	~ 300
MW-13B	1	PE	250 mL	HNO3		-	-	Sulfur, To	and the second se	APP	~ 300
WW-138	12	PE	250 mL	HNO3		-	-	Fe, Mn	00.00	VERPP	~ 305
mw-1BB		CG	40 mL	HCI			-	VOCS		APP	c100
-MARKS: ע נייייניייניייניייניייינייינייינייינייי	Nell historica Sodium persu	lly purges dry ulfate tested i	r. Purge one end field with CH	quipment volun IEMETS colorin	ne prior to sar netric tubes,		ield $DVP-1$ SzO8! 0.		d. EKA	-w-13B(m	s/msD) collect
ATERIAL CO	DDES:	AG = Amber	· · · · · · · · · · · · · · · · · · ·	= Clear Glass; eristaltic Pump;	PE = Poly B = Bai		PP = Polypropyl Bladder Pump;	ene; S = Silico ESP = Electri			Other (Specify)

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР					acksonville, FL					
	EKMW-14			SAMPLE					DATE:	04/07	12.07	0
	2				PURC	SING DA	<b>FA</b>		-		1000	
WELL DIAMETE	R (inches): 2		IG ETER (inches):		LL SCREEN		STATIC D	DEPTH ER (feet): 3	24	PURGE PUN OR BAILER:	IP TYPE	PP
	LUME PURGE: ut if applicable)	1 WELL VO				TIC DEPTH T	O WATER) X	WELL CAPAC	ITY .			
	NT VOLUME P	URGE: 1 EC	= ( UIPMENT VOI	L. = PUMP VOI	<u>feet –</u> _UME + (TUE	ING CAPACIT	feet) X Y X Tl	JBING LENGTH	gallon: ) + FLOW	<u>s/foot =</u> / CELL VOLU	IME	gallons
(only fill ou	ut if applicable)			= () g	allons + ( o.	0026 gallo	ns/foot X	30 feet	)+ 01	3 2 gall	ons = 🖒	. 2 gallons
	UMP OR TUBIN WELL (feet):	IG 21		MP OR TUBING WELL (feet):	³ 21	PURGING	3 DAT: 15 21	PURGING ENDED AT:	15:2	4 TOTAL PURG	VOLUM ED (gallo	E ns): 0 . 25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURB (NT		OLOR escribe)	ORP (mV)
15:24	0.25	0.25	0.08	4.74	6.07	26.17	3044	1.05	7.0	7 <b>2</b> e	lear	-44.1
		·	_			2					_	
			_									
			_									
-												
WELL CA	PACITY (Gallon	is Per Foot):	<b>0.75</b> " = 0.02;	1" = 0.04;	<b>1.25"</b> = 0.00	6; <b>2"</b> = 0.16	; <b>3"</b> = 0.37;	<b>4</b> " = 0.65;	<b>5</b> " = 1.02	2; 6" = 1.4	7; <b>12</b> "	= 5.88
	NSIDE DIA. CAI			.0006; 3/16' BP = Bladder F	' = 0.0014;		5; <b>5/16''</b> = 0. Submersible Pu			1/2" = 0.010		= 0.016
TONGING		JODE3.	<b>3</b> – Daller,	BF - Blauuel I		LING DA		np, FF-F	eristaltic F	Pump, C	- Other	(Specify)
	BY (PRINT) / A			SAMPLER(S)				SAMPLING		3 SAM	PLING	1
	Zinckgr	of 16c	syntec	B	n	zu		INITIATED A	¥11			15:45
PUMP OR DEPTH IN	WELL (feet):	2	.1		ODE:	PE, S		-FILTERED: 🔗		FILT	R SIZE	<u>ο.45</u> μm
FIELD DE	CONTAMINATIO	ON: PU	MPY	D	TUBING	Y NO	olaced)	DUPLICATE:	Y	Ø		
	PLE CONTAINE		ATION			ESERVATION				SAMPLIN		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVAT USED		OTAL VOL D IN FIELD (m	F <b>INAL</b> וL) pH	ANALYSIS A METHO		CODE		LOW RATE
EKMW-14	1	CHEMETS	25 mL	NA	4	^	· -	S2O8 (Pers	ulfate)	APP		~ 300
EKMW-14	3	AG	40 mL	H2S04			24	тос		APP		C 100
EKMW-14	1	PE	250 mL	NONE		-		SO42-		APP	^	300
EKMW-14	1	PE	250 mL	HNO3		-	-	Sulfur, To	otal	& APP	_	- 300
EKMW-14	12	PE	250 mL	HNO3				Fe, Mn	Ois	Solved APP		- 300
EKMW-14 REMARKS		CG	40 ml	HCI				VOC		APP		c 100
	Well matorice			uipment volum EMETS colorim		npling.	Sz 08 :	0.35 mg/L	_ (~v	delution	)	
MATERIAL	CODES	AG = Amber	Glass; CG =	= Clear Glass;	PE = Poly	ethylene; F	P = Polypropyl	ene; <b>S</b> = Silico	one; T :	= Teflon;	) = Othe	r (Specify)
SAMPLING	GEQUIPMENT			eristaltic Pump; se Flow Perista	B = Bai Itic Pump;		Bladder Pump; Method (Tubing			ersible Pump; )ther (Specify		
OTES: 1.	The above of	do not cons	titute all of	the informat	ion require	d by Chapte	r 62-160, F.A	.C.				

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

SITE NAME:	NAS JAX EK	ТАР			SI	TE ICATION:	Jacksonville, F	Ľ			
	EKMW-11			SAMPL					DATE: C	24/21/2	ల ల
					PURG	ING DA	TA			110,1-	
			ETER (inches):	1/4 DE	ELL SCREEN I PTH: 19 fe	NTERVAL et to 23 1	STATIC feet TO WA	C DEPTH TER (feet): 4.2 X WELL CAPA	50 0	PURGE PUMP OR BAILER:	ТҮРЕ
EQUIPME		URGE: 1 EQ	= ( UIPMENT VO	L. = PUMP VC	feet – DLUME + (TUB	ING CAPAC	feet) ITY X	X	gallons/ H) + FLOW	/foot = CELL VOLUM	gallons
(only fill ou	t if applicable)			=	gallons + (Ø. 4	<i>70 26</i> gall	ons/foot X	23 fe	et) + 0 · 13	3Z gallor	s = O - Z gallons
	JMP OR TUBIN WELL (feet):	^{IG} Z1		MP OR TUBIN WELL (feet):	IG ZI	PURGIN	IG ED AT: 134	47 PURGING ENDED A	T: 1350	TOTAL V PURGED	OLUME (gallons): O . 55
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)		DEPTH TO WATER (feet)	pH (standärd units)	ŤEMP. ( ^o C)	COND. (circle units) µmhos/cm	(circle units)			LOR ORP cribe) (mV)
B54	1.55	0.58	0.08	7.50	3.05	2601	9858	1.03	25.8	7 CLE	AD 512.1
						, ,					
			1.27								
WELL CA	PACITY (Gallor	ns Per Foot):	0.75" = 0.02;	1" = 0.04;	1.25" = 0.06	6; <b>2''</b> = 0.1	6; <b>3</b> " = 0.3		<b>5</b> " = 1.02;		
	EQUIPMENT		/+t.): 1/8" = 0 B = Bailer:	BP = Bladder			26; 5/16'' = Submersible		eristaltic P	1/2" = 0.010; ump: 0 =	5/8" = 0.016 Other (Specify)
1010110		/				LING D		anip, 11-	T CHARACTER T		Other (opeonly)
SAMPLED	PRINT) / A	1	STNTEC	SAMPLER(S	SIGNATURE		4	SAMPLING	AT: 1400	SAMPI	ING DAT: 1410
PUMPOR		C	STATEL	TUBING	$\sim$	10	FIE	LD-FILTERED			SIZE: 4.45 µm
DEPTH IN	WELL (feet):	21		MATERIAL	CODE: M	E,S	Filtr	ation Equipment	Туре:	-	
FIELD DEC	CONTAMINATIO	ON: PU	MP Y C		TUBING	Y NR	placed)	DUPLICAT	E: Y	$\bigcirc$	- T
SAMPLE		MATERIAL	ATION VOLUME	PRESERVA		OTAL VOL	FINA	ANALYSIS	AND/OR	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
ID CODE EKMW-11	CONTAINERS 1	CODE CHEMETS	25 mL	USED NA	ADDE	D IN FIELD	(mL) pH	S2O8 (Pe		APP	6200
EKMW-11	3	AG	40 mL	H2S04			12	тос		APP	
EKMW-11	1	PE	250 mL	NONE		-		504		APP	+ +
EKMW-11	1	PE	250 mL	HNO3			42	Sulfur,		APP	
EKMW-11	1	PE	250 mL	HNO3			42	Fe, N		APP	
			Lovine	TINOS				18,1		7.4.1	1
REMARKS	Well historica Sodium pers	ally purges dr sulfate tested	y. Furge one e	quipment volu EMETS colori	me prior to sar metric tubes.	npling.					
MATERIAL	· · · ·		Glass; CG			ethvlene:	PP = Polypro	pylene; <b>S</b> = Sil	icone: T =	Teflon: O	= Other (Specify)
	GEQUIPMENT	CODES:	APP = After P RFPP = Rever	eristaltic Pump	; <b>B</b> = Bai	ler; BP =	Bladder Pum		ctric Submer	rsible Pump; her (Specify)	calor (openity)
OTES: 1.	The above										

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)
#### Form FD 9000-24 GROUNDWATER SAMPLING LOG

SITE NAME:	NAS JAX EK	ΓAP				TE DCATION:	Jackson	iville, FL				*	
	EKMW-12			SAMPL	EID: EKMV				1	DATE: 0	4/21/20		
					PURC	SING DA	TA		l_		1/2/1		
WELL	R (inches): 2		TER (inches):	74 DE	LL SCREEN PTH: 19 fe	INTERVAL et to 23	feet 1		R (feet): 4.03	S OF	RGE PUMP T' 8 BAILER:	/PE	PP
	t if applicable)	1 WELL VO	ILUME = (IUI = (	AL WELL DE	feet-	IIC DEPTH		feet) X	WELL CAPACI		pot =		gallons
	NT VOLUME PU	JRGE: 1 EQ		., = PUMP VC		BING CAPAC			BING LENGTH)				L L
	it il applicable)			= 0 1	gallons + ( 🍬	00 7 6 gall	lons/foot	X 2	3 feet)	+ 0-13			gallons
	UMP OR TUBING WELL (feet):	G ZI	FINAL PUI DEPTH IN	MP OR TUBIN WELL (feet):	G 21	PURGI	NG ED AT:	1425	PURGING ENDED AT:	1430	TOTAL VOI PURGED (g	UME allons	): 0.25
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. ( ^o C)	(circle µmh	DND. e units) pos/cm µS/cm	DISSOLVED OXYGEN (circle units) mg// or % saturation	TURBIDI (NTUs	) (descrit	e)	ORP (mV)
1430	0.25	0.25	6.05	4.98	5.53	26.67	4	670	1.69	30.6	, ULGA	R	62.3
											1		
												_	
											_	_	
		14		_								_	
								-				_	
			_									_	
												_	
MELL OF	PACITY (Gallon	- Des Casti	0.75% - 0.02	4" = 0.04	1.25" = 0.0	6; <b>2</b> " = 0.	10: 2	" = 0.37;	<b>4</b> " = 0.65;	<b>5"</b> = 1.02;	6" = 1.47;	12" =	5.99
TUBING I	NSIDE DIA. CA	PACITY (Gal.	/Ft.): 1/8" = 0	.0006; 3/1				5/16" = 0.0			2" = 0.010;		0.016
PURGING	EQUIPMENT C	ODES: I	B = Bailer;	BP = Bladder		SP = Electric		ersible Pur	mp; <b>PP =</b> Pe	eristaltic Pu	mp; O = C	ther (S	Specify)
CAMPLER	BY (PRINT) / A	EEU IATI AN		CAMPIED/	S) SIGNATUR	LING D	ATA		1				1
SAWFLEL	5	/		SAMPLER	SI SIGARION				SAMPLING	1430	> SAMPLIN	NG NT:	14 48
PUMPOR	TUBING	1	OSYNTEL	TUBING	S	2			FILTERED: (7		FILTER S	IZE: ç	2.45 µm
	WELL (feet):	5		MATERIAL		E,S	<u>.</u>	-	on Equipment Ty		R		
	CONTAMINATIO			り	TUBING		replaced	3)	DUPLICATE	Y			
SAM SAMPLE ID CODE	PLE CONTAINE # CONTAINERS	R SPECIFIC MATERIAL CODE	ATION VOLUME	PRESERVA	TIVE	RESERVATION TOTAL VOL		FINAL	INTENDE ANALYSIS AI METHO	ND/OR	SAMPLING EQUIPMENT CODE	FL	IPLE PUMP OW RATE per minute)
EKMW-12	1	CHEMETS	25 mL	NA		-		 	S2OB (Pers	ulfate)	APP	<2	.oC
EKMW-12	3	AG	40 mL	H2S04				62	тос		APP		1
EKMW-12	1	PE	250 mL	NONE				_	504 ²⁻		APP		
EKMW-12	1	PE	250 mL	HNO3		_	4	22	Sulfur, To	otal	APP		
EKMW-12	1	PE	250 mL	HNO3				L2	Fe, Mn		APP	4	
										0			
REMARKS		ally purges dr ulfate tested	y. Purge one e in field with CH	quipment volu EMETS color	me prior to sa metric tubes.	maling.	ŕ	ELSN	FATE: C	5.75	/_		
MATERIA	L CODES:	AG = Amber	Glass; CG	= Clear Glass	PE = Pol	yethylene;	PP ≃ F	Polypropyl	ene; <b>S</b> = Silico	one; <b>T</b> =	Teflon; <b>O</b> = (	Other (	Specify)
SAMPLIN	G EQUIPMENT		APP = After P RFPP = Rever					er Pump; d (Tubing	<b>ESP</b> = Electr Gravity Drain);		ible Pump; er (Specify)		
NOTES: 1	The above of	lo not con	stitute all of	the informa	tion require	ed by Chap	oter 62-	160, F.A	.C.				

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

Revision Date: February 12, 2009

#### Form FD 9000-24 GROUNDWATER SAMPLING LOG

SITE NAME:	NAS JAX EK	ТАР				TE DCATION:	Jacksonville	e, FL.						
	EKMW-13B			SAMPLE		N-13B				DATE:	04/2	1/20		
					PUR	SING DA	TA			1	1-	• /		
WELL DIAMETER			TER (inches):	14 DEF	LL SCREEN PTH: 19 fe	INTERVAL et to 23 f	eet TO	WATER	EPTH R (feet): ろ・5 WELL CAPACI		PURGE DR BAIL	PUMP TY LER:	^{pe} P	?₽
(only fill ou	t if applicable)		= (	-	feet -	-	fee	rt) X	-	gallons	/foot			gallons
	NT VOLUME Pl t if applicable)	URGE: 1 EQ	UIPMENT VOI		UME + (TUR	BING CAPACI	тү х	τu	BING LENGTH)	+ FLOW	CELL \		0.7	
	JMP OR TUBIN WELL (feet):	G 21	1	MP OR TUBING		PURGIN			PURGING	150	Т	DTAL VOL	UME	0.25
TIME	VOLUME PURGED (gallons)	CUMUL, VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	CONE (circle un µmhos/ er µS/c	nits) /cm	DISSOLVED OXYGEN (circle units) mg/ or % saturation	TURBI (NTL		COLOF (describ		ORP (mV)
15 05	0.25	0.25	0.05	9.60	5.54	26.95	355	56	1.83	5.7	6	LUEA	z 5	9.0
														<u>^</u>
					C4 11			- 22						
										10				
	PACITY (Gallon SIDE DIA. CAI					6; 2" = 0.1 1/4" = 0.002		0.37; 5" = 0.0		5" = 1.02 006	6" 1/2" = (		12" = 5. 5/8" = 0.	
	EQUIPMENT		B = Bailer;	BP = Bladder		SP = Electric			and the second se	eristaltic P			her (Spe	0000
1	6		1			LING/D/	ATA							
SAMPLED	BY (PRINT) / A	1,	Tord. St.	SAMPLER(S	SIGNATUR	ELST			SAMPLING INITIATED A	т: <i>15</i>		SAMPLIN ENDED A		535
PUMPER	TUBING	1	HOS!NAL	TUBING	6Y			FIELD-	FILTERED: Y			FILTER S		
	WELL (feet):		-1	MATERIAL C		ES			n Equipment Ty	pe:				
FIELD DEC	CONTAMINATIO	ON: PU	MP Y (1	v'2	TUBING	Y Mg	eplaced)	_	DUPLICATE:	(Y	<i>ν</i>	N		
SAMPLE		MATERIAL		PRESERVAT	IVE	RESERVATIO	FI	NAL	INTEND ANALYSIS A METHO	ND/OR	EQUI	PLING PMENT ODE	FLOV	E PUMP VRATE rminute)
ID CODE EKMW-13B	CONTAINERS 1	CODE CHEMETS	25 mL	USED NA		ED IN FIELD (	<u>mL)    </u>	pH —	S2O8 (Pers			.PP		2000
EKMW-13B	3	AG	40 mL	H2S04		-	4	٢	тос	,		PP		
EKMW-13B	1	PE	250 mL	NONE		-		-	SO42-			/PP		
EKMW-13B	1	PE	250 mL	HNO3		~		۲.	Sulfur, T	otal		<b>PP</b>		
EKMW-13B	1	PE	250 mL	HNO3			L.	r	Fe, Mn		A	PP	4	/
	2								all.	P				
REMARKS	with matching			quipment volun IEMETS colorin		mpling.	DUP_0	1 \$	MS/MSD					*
MATERIAL	CODES:	AG = Amber	Glass; CG	= Clear Glass;	PE = Pol	yethylene;	PP = Poly	/propyle	ene; <b>S</b> = Silice	one; T=	= Teflon	; <b>O</b> = C	ther (Sp	ecify)
SAMPLING	G EQUIPMENT			eristaltic Pump se Flow Perista			Bladder P Method (1		<b>ESP</b> = Elect Gravity Drain);		rsible F ther (Sj			14
OTES: 1.	The above	do not cons	stitute all of	the informat	ion require	d by Chapt	ter 62-16	0, F.A.	.C.					

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

**pH:**  $\pm$  0.2 units **Temperature:**  $\pm$  0.2 °C **Specific Conductance:**  $\pm$  5% **Dissolved Oxygen:** all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) **Turbidity:** all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

Revision Date: February 12, 2009



#### Form FD 9000-24 GROUNDWATER SAMPLING LOG

SITE NAME:	NAS JAX EK 1	AP				SI		ackso	nville, FL					
	EKMW-14	7		SAM	MPLE ID:	EKMV					DATE:	64/21	120	
							ING DA	ТА				. , /0.	10-	
	R (inches): 2		TER (inches):	14	WELL SO DEPTH:	CREEN	INTERVAL et to 23 fe	eet	STATIC D	R (feet): 4-4	G O	URGE F	PUMP TYF ER:	PE PP
	UME PURGE: t if applicable)	1 WELL VO	LUME = (TOT	AL WELL	DEPTH		TIC DEPTH T	O WA	TER) X	WELL CAPAC	gallons/	foot =		gallon
	NT VOLUME PL	IRGE: 1 EQU	= ( JIPMENT VOL	. = PUMF	VOLUME	- 	ING CAPACI	TY		BING LENGT				guiteri
(only fill ou	t if applicable)			= 4	gallon	s+(0·	0026 gallo	ons/foo	otX 2	3 fee	t)+ 0-13	32	gallons =	🥶 - 2 gallon
	IMP OR TUBINO WELL (feet):	3 21	FINAL PUN DEPTH IN			21	PURGIN INITIATE	G ED AT	: 1545				TAL VOLL RGED (ga	Ilons): 0, 2
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEP TC WAT (fee	) ER (st	pH andard units)	TEMP. (°C)	(circ μm	OND. the units) thos/cm tS/cm	DISSOLVED OXYGEN (circle units) (mg/L) or % saturation			COLOR (describe	:) (mV)
1551	0.25	0.25	0.05	10.7	0 6	2=11	26.15	2	874	1.63	15.	6	CLEAN	2 64.7
											_			
_														_
			_					_			-			
_						_				1	-	-		
			_	-				-			_			
			-		-									
		-	-	-										
				-										
WELL CA	PACITY (Gallon	s Per Foot):	<b>0.75"</b> = 0.02;	1" = 0.	.04; 1.2 3/16" = 0	5" = 0.0	6; 2" = 0.1 1/4" = 0.002	6;	3" = 0.37; 5/16" = 0.		5" = 1.02; 0.006;	6" = 1/2" = 0		12" = 5.88 /8" = 0.016
	EQUIPMENT				dder Pum		SP = Electric		208		Peristaltic P	· · · · · · · · · · ·		ner (Specify)
1		/	r		./s	SAMP	LING D	ATA						
SAMPLED	BY (PRINT) / A	11		SAMPL	ER(S) SIE	NATUR	É(S)	-		SAMPLING			SAMPLING	
	TURING	AICT/6	TEUSTUTE	TUBING	$\sim$	St	A	1	FIELD	-FILTERED:				ZE: <u>° <del>Γ</del>΄ μ</u> m
	WELL (feet):	2		MATER	IAL CODE		E,S		Filtrati	on Equipment	Type:			
FIELD DE	CONTAMINATIO	DN: PUI	MP Y (	£		UBING		eplace	ed)	DUPLICAT			N J	
	PLE CONTAINE		ATION	DDEOF						INTEN ANALYSIS			PLING PMENT	SAMPLE PUN FLOW RATE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME		RVATIVE SED		TOTAL VOL	(mL)	FINAL pH	METH			DDE	(mL per minut
EKMW-14	1	CHEMETS	25 mL	N	A	a.			ser	S2O8 (Pe	rsulfate)	_	PP	6200
EKMW-14	3	AG	40 mL		S04				22	тос			PP	
EKMW-14	1	PE	250 mL		ONE	_	-	_	-	SO4			PP	
EKMW-14	1	PE	250 mL		NO3				42	Sulfur,			PP PP	-
EKMW-14	1	PE	250 mL	Н	NO3	l		_	42	Fe, N	AITI	A		
REMARKS	a source and		y. Purge one e in field with CH				mpling.	ļ						
MATCOLA				= Clear G			vethylene;	PD -	Polypropy	lene; <b>S</b> = Sil	icone [.] T =	- Teflon	: <b>0</b> =0	ther (Specify)
MATERIA		AG = Amber CODES:	APP = After P			B = Ba			der Pump;		ctric Subme			
			RFPP = Rever	se Flow F	Peristaltic	Pump;	SM = Straw	v Meth	od (Tubing	Gravity Drain)		ther (Sp		
NOTES: 1	The above	do not con	stitute all of	the info	TION OF L	requir	ed by Chap	UTIVE	READING	A.C. S (SEE FS 22	12. SECTIO	N 3)		

pH:  $\pm$  0.2 units Temperature:  $\pm$  0.2 °C Specific Conductance:  $\pm$  5% Dissolved Oxygen: all readings  $\leq$  20% saturation (see Table FS 2200-2); optionally,  $\pm$  0.2 mg/L or  $\pm$  10% (whichever is greater) Turbidity: all readings  $\leq$  20 NTU; optionally  $\pm$  5 NTU or  $\pm$  10% (whichever is greater)

Revision Date: February 12, 2009

### APPENDIX B BORING LOGS AND WELL CONSTRUCTION LOGS

Appendix B Boring Logs and Well Construction Logs

## Geosyntec[▶]

#### consultants Borehole No. E10 Page 1 of 1 **Borehole Log** Project No.: Location: TR0673 NAS-JAX OU3, FL Client: ESTCP Coordinates: **Borehole Diameter:** Logged By: Joshua Barnhart 4 inches **Reviewed By:** M. Watling Site Datum: Drilling Company: EDS - JR Pennington Ground Surface Elevation: **Drilling Method:** Top PVC Casing Elevation: N/A Hollow Stem Auger Well Material: Schedule 40 PVC **Completion Date:** 11 June 2019 Well Comments **Geologic Samples** Configu Ω ration Unified Soil Classification Recovery (%) Soil Sample Stratigraphy Water Level PID (ppmv) Lithologic Description Depth (m) Depth (ft) No recovery Flush-mount protective cover 1 Surface Seal Grout 2 3 4 5 6 2 7 8 Portland Cement 9 Type I/II 3 10 11 12 13-Δ 14 15 16 5 Bentonite Pellet Seal, Type TR30 17 SP SAND, grey, wet, loose, fine grain, light brown at bottom. SC 18 Clayey SAND, grey, wet, cohesive, fine grain. +30/65 Fine Sand CL Orange staining in the first 0.5 feet. Filter Pack 19 Sandy CLAY, grey, wet, semi-firm, low plasticity. SP 6 SAND, light grey, wet, cohesive, fine grain. 20 +20/30 Sand Filter Pack CLAY, grey, wet, semi-firm, low plasticity. CL 21 4-inch Dia. SAND, grey to brown, wet, cohesive. Slotted SCH 40 SP **PVC Screen** 22 (0.01 inch) CLAY, grey, wet, semi-firm, medium plasticity. CL 7 4-inch Dia. PVC 23-Borehole depth 23.0 ft End Cap 24 Notes: m - metres ft - feet 25 NA - not applicable PID - photoionization detector 26 8 ppmv - parts per million by volume PVC - polyvinyl chloride 27

CTS/TR0673 EK-TAP.GPJ; ile:

## Geosyntec▷

Bore	eho	le l	No.	E11 F	Page 1 of 1		Bor	ehole	Log		onsultants
Projec	t No.:		TR	0673	Locatior	n:		NAS-JA	X OU3, FL		
Client:			ES	TCP	Coordin	ates:					
ogge	d By:		Jos	shua Barnhart	Borehol	e Diametei	r:	4 inches	3		
Review	ved B	v:	М.	Watling	Site Date	um:					
Drilling		-		S - JR Pennington	Ground	Surface El	evation:				
Drilling	-			llow Stem Auger		Casing E		N/A			
Well M	-			hedule 40 PVC		ion Date:		12 June	2019		
-					•		Goolog	ic Sample		Well	Comments
						_	-			Configu-	Comments
-		le le	hy	Lithologia Descriv	ation	oil	%)	$\widehat{\mathbf{z}}$	ple I	ration	
(ff)	۳ ۳	r Le	grap	Lithologic Descrip	Dtion	ifica	very	udc	am		
Depth (ft)	Depth (m)	Water Level	Stratigraphy			Unified Soil Classification	Recovery (%)	PID (ppmv)	Soil Sample ID		
	Δ	3	ю	No recovery		<u>⊃0</u>	Ŕ	<u> </u>	Ň		← Flush-mount
1-				No recovery							protective cove
1											[\] Surface Seal Grout
2											Croat
3											
	-1										
• -											
5											
6											
<b>,</b> -	-2										
7											
8-											
9											<ul> <li>Portland Ceme</li> <li>Type I/II</li> </ul>
10-	-3										
11_											
12											
13-											
-	-4										
14											
15			स्टब्स्ट्रस्ट	SAND, grey, saturated, loose, fi							
16-			////	\staining throughout.	<b>u</b> . <b>u</b> /	SC					
-	-5			Clayey SAND, grey, cohesive, fi staining.	ne grain, orange	CL					<ul> <li>Bentonite Pelle</li> </ul>
17-				Sandy CLAY, grey, semi-firm, lo	w plasticity.	sc					Seal, Type TR3
18				Clayey SAND, grey, compact, fin	ne grain, orange	CL					
19				staining in the first 0.25 feet Orange staining in the first 0.25	feet.	CL					<ul> <li>30/65 Fine San Filter Pack</li> </ul>
19	-6			Increase in grain size in the last	0.25 feet.	CL					
20				Sandy CLAY, grey, semi-firm, lo CLAY, grey, semi-firm, semi-pla		CL					<ul> <li>20/30 Sand Filt</li> <li>Pack</li> </ul>
21				Sandy CLAY, grey, semi-firm, lo	w plasticity, wet.	CL				│ 目◄	-4-inch Dia.
22				Orange staining in the first 0.25							Slotted SCH 40 PVC Screen
-	_			CLAY, grey, wet, semi-firm, med Sandy CLAY, wet, grey, semi-fir		CL					(0.01 inch)
23	-7		<u> /////</u>	Orange staining in the first 0.25	feet.						-4-inch Dia. PV End Cap
24				CLAY, grey, semi-firm, medium	plasticity.						Notes:
25-				Borehole depth 23.0 ft							m - metres ft - feet
											NA - not applicable PID - photoionization
26-	-8										detector ppmv - parts per milli
27—											by volume PVC - polyvinyl chlori
-											

# Geosyntec▷

Boreho				e 1 of 1						
Project No. Client:	:	TR0 EST		Location: Coordina			NAS-JA	X OU3, FL		
Logged By			e Zinckgraf		Diameter	<b>.</b> .	4 inches	2		
Reviewed E			Vatling	Site Datu		•	4 mones	,		
Drilling Co	-		- JR and Mitch Pennington		Surface El	evation:				
Drilling Met			ow Stem Auger		Casing E					
Well Materi			edule 40 PVC	Completi			25 June	2019		
				•		Geolog	ic Sample		Well	Comments
					۲	-			Configu- ration	
	evel	hh	Lithologic Description		Soil atio	y (%	(vr	alqr	radon	
th (f	er Lo	tigra			ied S	over	(ppr	San		
Depth (ft)	Water Level	Stratigraphy			Unified Soil Classification	Recovery (%)	PID (ppmv)	Soil Sample ID		
	-		Not logged							Flush-mount
1-1-										protective cov Surface Seal
2										Grout
, <del> </del>										
°1										
4										
5										
6										
-2										
7										
8										
9										
3										<ul> <li>Portland Cen Type I/II</li> </ul>
103										
11										
<b>2</b>										
<b>4</b> <u>−</u> <u>+</u>										
15										
<b>6</b> —										
5										
7-										
18										
I9—										<ul> <li>30/65 Fine Sa Filter Pack</li> </ul>
206										
-										20/30 Sand F Pack
21										—4-inch Dia. Slotted SCH
22										PVC Screen
237										(0.01 inch) ─4-inch Dia. P`
-			Borehole depth 23.0 ft							End Cap
24										Notes: m - metres
25										ft - feet NA - not applicable
26—										PID - photoionizatio
0										ppmv - parts per m by volume
27										PVC - polyvinyl chl

## Geosyntec[▷]



## Geosyntec[▶]

#### consultants Borehole No. EKMW-13B Page 1 of 1 **Borehole Log** Project No.: TR0673 Location: NAS-JAX OU3, FL Client: ESTCP Coordinates: **Borehole Diameter:** Logged By: Joshua Barnhart 2 inches **Reviewed By:** M. Watling Site Datum: Drilling Company: EDS - JR Pennington Ground Surface Elevation: **Drilling Method:** Top PVC Casing Elevation: N/A Hollow Stem Auger Well Material: Schedule 40 PVC **Completion Date:** 11 June 2019 Well Comments **Geologic Samples** Configu Ω ration Unified Soil Classification Recovery (%) Soil Sample Stratigraphy Water Level PID (ppmv) Lithologic Description Depth (m) Depth (ft) No recovery Flush-mount protective cover 1 Surface Seal Grout 2 3 4 5 6 2 7 8 9 Portland Cement 3 10 Type I/II 11 12 13-- 4 14 SAND, light brown, saturated, loose, fine grain SP Clayey SAND, light brown and grey, wet, SC 15 cohesive, fine grain, orange staining throughout. Sandy CLAY, grey, wet, compact, semi-plastic, orange staining throughout. CL 16 5 sc Clayey SAND, grey to light grey, wet, cohesive, 17 fine grain and increasing with depth Orange staining in the first 0.75 feet 18 Bentonite Pellet CLAY, grey, wet, semi-firm, medium plasticity. Seal, Type TR30 30/65 Fine Sand 19 Filter Pack 6 20 CL ▲20/30 Sand Filter Pack 21 2-inch Dia. Slotted SCH 40 **PVC Screen** 22 (0.01 inch) 7 2-inch Dia. PVC 23-Borehole depth 23.0 ft End Cap 24 Notes: m - metres ft - feet 25 NA - not applicable PID - photoionization detector 26 8 ppmv - parts per million by volume PVC - polyvinyl chloride 27

GP ile:

## Geosyntec[▶]



GP ile:

# Geosyntec^D consultants

Bor	eho	le N	0.	S9 Page	e 1 of 1		Bor	ehole	Log		onsultants
Clien Logg Revie Drilli Drilli	ed By: ewed B	By: npany: hod:	ES Bla M. ED Hol	0673 TCP ine Dawson Watling S - JR Pennington Ilow Stem Auger nedule 40 PVC	Site Datu Ground S	ites: Diameter im: Surface El Casing El	evation:	4 inches			
					Completi		Geolog	ic Sample		Well	Comments
Depth (ft)	Depth (m)	Water Level	Stratigraphy	Lithologic Description		Unified Soil Classification	Recovery (%)	PID (ppmv)	Soil Sample ID	Configu- ration	
1 2 3 4 5 6 7 8 9 10 11 12 13 14				Not logged							<ul> <li>Flush-mount</li> <li>protective cove Surface Seal Grout</li> <li>Portland Ceme Type I/II</li> </ul>
15– 16– 17–	5										■ Bentonite Pelle Seal, Type TR
18 19 20 21 22	6										<ul> <li>30/65 Fine Sal Filter Pack</li> <li>20/30 Sand Fil Pack</li> <li>4-inch Dia. Slotted SCH 4 PVC Screen (0.01 inch)</li> </ul>
23 24 25 26 27	7 			Borehole depth 23.0 ft							- 4-inch Dia. PV End Cap Notes: m - metres t - feet NA - not applicable PID - photoionizatior detector ppmv - parts per mill by volume PVC - polyvinyl chlor

# Geosyntec^D

Droioc	ct No.:		тро	0673	Location				X OU3, FL		
Client			EST		Coordina			NAS-JA	IX 003, FL		
	ed By:			ce Zinckgraf		Diameter		4 inches	3		
	wed B			Vatling	Site Datu						
		npany:		S - JR and Mitch Pennington		Surface El	evation:				
	g Met			ow Stem Auger		Casing E					
	_ /lateria			edule 40 PVC	Completi			24 June	2019		
							Geolog	ic Sample	S	Well	Comments
						ç	_			Configu- ration	
f)	Ê	evel	hde	Lithologic Description		Soil	ry (%	( î	nple		
Depth (ft)	Depth (m)	Water Level	Stratigraphy			ssific	Recovery (%)	PID (ppmv)	Soil Sample ID		
Dep	Dep	Wa	Stra			Unified Soil Classification	Red	믭	Soil		
=				Not logged							Flush-mount
1-	_										Surface Seal
2	-										Grout
3_	-										
	-1										
4-	-										
5	-										
6	-										
	-2										
7	-										
8-	-									S S	<ul> <li>Portland Cerr</li> </ul>
9	_										Type I/II
10-	-3										
-	_										
11-	_										
12	_										
13-	4										
Ξ	-4										
14	_										
15	-										
16–	-										
17-	-5										<ul> <li>Bentonite Pel Seal, Type TF</li> </ul>
-	-										Зеаі, туре п
18-	-										← 30/65 Fine Sa
19_	-										Filter Pack
20-	-6										←20/30 Sand F
3	-										Pack
21-	-									■◀	─4-inch Dia. Slotted SCH 4
22	-										PVC Screen (0.01 inch)
23	-7			Borehole depth 23.0 ft				+ +			-4-inch Dia. P\
24	_										End Cap
-	_										Notes: m - metres
25–	_										ft - feet NA - not applicable
26	8										PID - photoionizatio detector
-	5					1					ppmv - parts per mi by volume

# Geosyntec▷

Boreh		TD	0673	Location				X OU3, FL		
Client:	J		TCP	Coordina			NAS-JA	X 003, FL		
Logged B	v:		ce Zinckgraf		e Diameter	r:	4 inches			
Reviewed		-	Watling	Site Datu						
Drilling Co	-		S - JR and Mitch Pennington		Surface El	evation.				
Drilling M			low Stem Auger		Casing E					
Well Mate			nedule 40 PVC	Completi		io ration.	24 June	2019		
						0			Well	Comments
							ic Sample		Configu-	Comments
	kel	hy	Lithelegie Description		Unified Soil Classification	Recovery (%)	$\widehat{\mathbf{z}}$	Soil Sample ID	ration	
(ff) (ff)	r Le	grap	Lithologic Description		ed S iffice	Very	udd	àam		
Depth (ft) Depth (m)	Water Level	Stratigraphy			Inifie	eco	PID (ppmv)	oil		
	>	S	Not logged		50			٥ ٥	A B	Flush-mount
1										protective cov
										Surface Seal Grout
2										
31										
<b>4</b> ––––––––––––––––––––––––––––––––––––										
5										
6										
<b>7−</b> 2										
' <u>+</u>										
8										<ul> <li>Portland Cerr</li> </ul>
9										Type I/II
103										
11										
12-										
-										
13										
14										
15										
_										
16									<u> </u>	<ul> <li>Bentonite Pel</li> </ul>
17										Seal, Type TI
18										
										- 30/65 Fine Sa
19										Filter Pack
206										← 20/30 Sand F
21-										Pack —4-inch Dia.
-										Slotted SCH
22										PVC Screen (0.01 inch)
237			Borehole depth 23.0 ft				+		╞╘╛╼	-4-inch Dia. P
24										End Cap
1										Notes: m - metres
25-										ft - feet NA - not applicable PID - photoionizatic
26										detector
-0										ppmv - parts per mi by volume
27—					1	1	1 1		1	PVC - polyvinyl chlo

# Geosyntec▷

Boreho				age 1 of 1		Bor	ehole	Log	C	onsultants
Project No. Client: Logged By Reviewed E Drilling Cou Drilling Met Well Materi	: 3y: npany: :hod:	ES ⁻ Bla M. ^v ED [:] Hol	0673 TCP ine Dawson Watling S - JR Pennington low Stem Auger nedule 40 PVC	Site Datu Ground S Top PVC	ates: e Diameter	evation:	4 inches			
					1	Goolog	ic Sample		Well	Comments
Depth (ft) Depth (m)	Water Level	Stratigraphy	Lithologic Descript	ion	Unified Soil Classification	Recovery (%)	(vmqq) OI4	soil Sample ID	Configu- ration	Flush-mount
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$										<ul> <li>Portland Ceme Type I/II</li> </ul>
18 19 20 6 21 6 21  22 	-		Borehole depth 23.0 ft							<ul> <li>Bentonite Pelle Seal, Type TR</li> <li>30/65 Fine Sau Filter Pack</li> <li>20/30 Sand Fil Pack</li> <li>4-inch Dia. Slotted SCH 4 PVC Screen (0.01 inch)</li> <li>4-inch Dia. PV End Cap</li> </ul>
24										Votes: n - metres t - feet VA - not applicable PID - photoionizatior detector opmv - parts per mill py volume PVC - polyvinyl chlor

### APPENDIX C LABORATORY CHAIN OF CUSTODY FORMS

Appendix C Laboratory Chain of Custody Forms

#### Eurofins TestAmerica, St. Louis 13715 Rider Trail North

#### 681-Atlanta

## Chain of Custody Record

Environment Testing

Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

Client Information	Sampler B. Phone: (9	Zinck	graf	Lat	o PM: valt. Ja	ivna K					Ca	rier Track	ing No(s)			COC No:		
Client Contact: Mr. Mark Watling	Phone: ( 9	04) -	302-1	500 E-M	Mail:	alt@to	otom	orioci			-					160-8189-4152. Page:	1	
Company: Geosyntec Consultants, Inc.				Joopay	laaw	antwite	Starrie	encan								Page 1 of 1 Job #:		
Address 130 Stone Road West	Due Date Request	ed:				and a second	1		Ar	alysis	Reque	sted			1222	Preservation Co	dag	
City.	TAT Requested (d	ays):													Control of the second	A - HCL	M - Hexane	
Guelph State, Zip;	_	STC					Mn (ICP)									B - NaOH C - Zn Acetate	N - None O - AsNaO2	2
ON, N1G3Z2 Phone:		310	,				Mg, Mn		jie rep							D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3	
	PO#: 100004032				Sec.		Fe,		- single							F - MeOH G - Amchlor	R - Na2S2C S - H2SO4	
Email: mwatling@geosyntec.com	WO #:				or No	ŝ	s - Ca,	IS)	(TOC)							H - Ascorbic Acid I - Ice J - DI Water	T - TSP Doo U - Acetone	
Project Name: NAS Jacksonville Project TR0673	Project #. 16008378				Vers	ORGFMS	Metals	(GC/N	Total						ners	K - EDTA L - EDA	V - MCAA W - pH 4-5	
SITE NAS JAX EK TAP	SSOW#:		Careford a		aldma	300	solved	- VOCs	Carbon,						contai	Other:	Z - other (sp	ecity)
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=A	Field Filtbred St	300_ORGFM_28D,	200.7_DOD5 - Dis	8260C_DOD5_LL	9060A - Organic C						<b>Total Number of</b>	Special Ir	structions	/Noto:
		> <		tion Code:	$\mathbf{X}$	× N	D		S	2-10 - 1 L			h and		X	CPCciul II	Structions	inote.
EKMW-11	7/11/19	11:15	G	Water	N	X	×	×	X									
EKMW-12	7/11/19	12:00	G	Water	11	X	x	X	×									
EKMW-13B	7/11/19	12:50	G	Water	Ш	X	×	X	X						- 20-			
EKMW-14	7111/19	13:40	G	Water	TI	X	X	×	×									
DUP-01	-	-	G	Water	111	X	X	×	X					-				
EKMW-14 (MS)	7/11/19	13:40	G	Water	111			×	-			+			100			
EKMW-14 (MSD)	7/11/19	13:40	G	Water				X				t		1    <b>1</b>   <b>1</b>    11    1				-
FIELD BLANK	7/11/19	14:45	G	Water	1	X	X	X	X			t						
TRIP BLANK 1	1	-	-	Water				X				t						-
TRIP BLANK 2	-	-	-	Water	$\dagger$			X				t _	60-348	370 Cha	in of	Custody		
													11	I				
Possible Hazard Identification       Non-Hazard       Flammable       Skin Irritant       Poliverable Requested: I, II, III, IV, Other (specify)	ison B 🗆 Unkn	own 🗆 F	Radiologica	1	S	ample R pecial	Disp eturn Instru	To C	(A1 lient	ee may l	be asse	ssed if . osal By .	sample. Lab	s are rei	taine Archiv	<b>d longer than 1</b> ve For	month) Months	
Empty Kit Relinquished by:	APR	Date:			Time			_	_			Method	of Shipme	int				
Relinquished by: Br-3af	Date/Time: 7/11/20 Date/Time:	15 18	:00	Company Geosy	_	Rece	ived by	-	M	lck	~				712	19 0905	Company 7A	9 TI
Relinquished by:	Date/Time: 1			Company 1			ived by	<i>r</i> .		- 6	2		Date/T	ime:		1 0105	Company	SIL
Relinquished by:	Date/Time:			Company		Rece	ived by	r.					Date/T	ime:			Company	
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No						Coole	er Tem	peratur	e(s) °	C and Othe	er Remark	K.	_					
									-								Mar Olive	

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## Chain of Custody Record

Environment Testing TestAmerica

4

Client Information	Sampler. B. Zincky	graf /	J. Ban	Lab P Awa	M: It, Ja	ayna	к					Carrie	r Trackin	g No(s)			COC No: 160-8517-4315.	1	
Client Contact. Michelle Cho	B. Zincky Phone: 904 -	302-1	500	E-Ma	il a aw	/alt@	testar	neric	ainc o	com							Page: Page 1 of 1		
Company. Geosyntec Consultants, Inc.				perm	Γ	4.165	tootal					_				-	Page 1 of 1 Job #:		
Address:	Due Date Requested	ł:			$\vdash$	100		-	A	naly	sis R	eques	ted	T T					
130 Stone Road West																	Preservation Co		
City Guelph	TAT Requested (day					121											B - NaOH	M - Hexane N - None	
State, Zip.		STC	>					del	CP)								C - Zn Acetate D - Nitric Acid	O - AsNaO2 P - Na2O4S	
ON, N1G3Z2 Phone:	PO#					100		- single rep	and Mn (ICP)								E - NaHSO4 F - MeOH	Q - Na2SO3 R - Na2S2O3	
	100004032						only	- Sir	and								G - Amchlor H - Ascorbic Acid	S - H2SO4	
Email mcho@geosyntec.com	WO #				or No)	-	Ifate	TOC	-Fe								I - Ice	T - TSP Dodeca U - Acetone	hydrate
Project Name:	Project #:					r No)	Anions - Sulfate only Sulfur (ICP)	otal (	atals							ers	J - DI Water K - EDTA	V - MCAA W - pH 4-5	
NAS Jacksonville Project TR0673	16008378				e (Y	es o	ions Ifur (	n, To	W pa							containers	L - EDA	Z - other (specifi	у)
Site	SSOW#				Sample (Yes		D - An	Carbon, Total (TOC)								of con	Other:		
			Sample Type	Matrix (w=water,	ered	WS/W	300_ORGFM_28D - Anions - Su 200_7_DOD5 - Total Sulfur (ICP)	9060A - Organic	200.7_DOD5 - Dissolved Metals - Fe							Total Number of			
Sample Identification			(C=comp,	S=solid, O=waste/oil,	Field I	Perform	10 0	60A	0.7							tal N			
Sample Identification	Sample Date	Time	G=grab) B Preservati		E.			-		-	-	-			-	P	Special Ir	structions/No	ote:
EKMW-11	1.1.10				Ĥ	XI		S	D	A		10 2450	22.12			X			1000
	the second se	10:10	G	Water	Щ	1	~ ×	X	-X										
EKMW-12		10:50	1	Water		3	XX	X	X										
EKMW- 13B		11:25		Water			XX	X	X										
EKMW-14		15:30		Water		>	<>	$\langle \rangle$											
DUP-01		-		Water		>	<>	(X	X							10			
FIELD BLANK	*	16:20	*	Water		)	XX	X	X										
					Ц														
					Ш														
					H			1	1	1	_								
160-36113 Chain of Custody			-		$\mathbb{H}$	-	-	+-	+	-				+-+					
Possible Hazard Identification					Ч,	Sam		SPOS		1 600	nou ba		and if a				d longer than 1		
Non-Hazard Flammable Skin Irritant	Poison B 🔲 Unkno		adiological					spus	Clie	a lee l			sed if s sal By L		are ret	aine	d longer than 1 ive For		
Deliverable Requested: I, II, III, IV, Other (specify)	, siden b sinne		aaloiogicai		5	Spec					quirem		sal By L	ab		Archi	ive For	Months	
Empty Kit Relinquished by:	Ir	Date:			Tim		-						Mothod	f Shipmon					
Relinquished by:	Date/Time:		Ic	ompany	1 and	-	ereiver	the		1 12			wethod c	f Shipmen		_		10	
Brzul	10/23/19	16:0		Seosyn	re	: [^	eceived	. Uy	N	10	K	~		Date/Tir	ne 241	9	0930	ETA S	TI
Relinduis red by:	Inditished by: Date/Time: Company						eceived	t by:			0	/		Date/Tir		-		Company	r lan
linquished by: Date/Time: Company						R	eceived	d by:		_				Date/Tir	ne.			Company	_
				enconstant of the			and the second							where a manual state				Company	
Custody Seals Intact: Custody Seal No.: ∆ Yes ∆ No						C	ooler T	emper	ature(s	s) °C ar	d Other	Remarks:							
											_			-		_		Ver: 01/16/20	

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## Chain of Custody Record

Environment Testing TestAmerica

4

5

10.	linck	aval		A	walt,	Jayn	аK						ouner n	acking No(	5)		COC No: 160-8549-4327.1
Phone:	904	302	-1500	) E-		walt	Otes	amo	ricoir				-				Page:
					T	want	wices.	anic	aicai								Page 1 of 2 Job #
Due Date	Requeste	ed:			12	5			T	An	alys	ISF	requeste		TT	100	Preservation Codes:
TAT Req	uested (da	iys):			-	Design											A - HCL M - Hexane
_		ST	-D		2	512			٩	(d							B - NaOH N - None C - Zn Acetate O - AsNaO2
		01	V			100			gle re				1				D - Nitric Acid         P - Na2O4S           E - NaHSO4         Q - Na2SO3
and the second second second	032					3	only			and N			λį,				F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4
WO #					or No	()	Ifate	_	(TOC)	- Fe	(S)		10 En				H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone
					Yes	or N	s - Su	r (ICP	Total	Vetals	GC/N		Sodi			ners	J - DI Water V - MCAA K - EDTA W - pH 4-5
160083 SSOW#	78				ple (	(Yes	Anion	Sulfu	pon,	lved h	ocs					ontai	L - EDA Z - other (specify) Other:
				1	1 San	MSD	28D - 1	Total	ic Car	Disso	- T-		(ICP/			of 1	
					0	/SW L	SFM S	- 500	Organ	- 500	OD5	SO	Vetals			mber	
		Sample	(C=comp,	S≂solid, O≖waste/oil	14	rforn	OR	0.7_D(	- A08	0.7_D(	SOC_D	- 20	- 808			al Nu	
Samp	e Date	Time				$\wedge$ $\land$	Sec. 18	-						-		Tot	Special Instructions/Note:
11/0	5/19	10:00		Water	N	ľ.	I	1		1	AN			103 24		X	
				Water	1		1	1		1	-	+					<u> </u>
				Water		H	1	1	-	1	2	,		+ +	++		<u> </u>
				Water	+	$\mathbb{H}$	1	1		1	3	•	1				
				Water		V			-	-	2	,	1		+-+-		
				Water	1	Y		-	-	+		·				135	Crastody
				Water		N			-			,	1				
	/		1	Water	1	1 . 1	1	1	2	1						132	
				Water	+	ŕ					-		,				
				Water	+							+			+ +-		(n)
				Water						1		+				100	<u>6</u>
		_			_	Sar	nple	Disp	osal	(A1	fee m	ay b	e assessed	l if samp	les are re	etaine	ed longer than 1 month)
Poison B	Unkn	own	Radiologica	al	_		Re	eturn	To C	lient		L	Disposal			Arch	hive For Months
		-			_		ecial I	nstru	iction	s/QC	Req	uirei					
Date/Tim	25	Date:		Company	Ti	me:	Passi	und he		-	1	n	Met	1			1
		9 1	2:00	Geos	inte	c	a	M	ha	le	~	h	W	Dal	1-7-1	9/	0920 Compast/
1001100-00311110				Company			Receiv	ved by	0					Da	e/Time:	V	Company
Date/Tim	31			Company			Receiv	ved by	1					Dat	e/Time:		Company
							Coole	Tem	peratu	re(s)	°C and	Othe	Remarks				
	-					_	-										Ver: 01/16/2019
	Due Date TAT Required PO # 100004 WO # Project # 160083 SSOW# Sample 11(/ 0	Due Date Requeste TAT Requested (da Po #: 100004032 WO # Project # 16008378 SSOW# Sample Date IL / OS / I 9 IL / OS / I 9 Date/Time:	Due Date Requested:         TAT Requested (days):         PO #         100004032         W0 #         Project #         16008378         SSOW#         Sample Date         Time         1U/0S/19 /0:00         10:25         12:30         13:30         14:05         14:05         15:00         V         Date:         Date/Time:         Date/Time:	Due Date Requested:         TAT Requested (days):         PO #         100004032         W0 #         Project #         16008378         SSOW#         Sample Date         Sample Date         Time         100024032         W0 #         Project #         16008378         SSOW#         Sample Date         Time         10:25         10:25         12:30         13:30         14:05         14:05         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         15:00         10:00 (19)         10:00 (19)         10:00 (19)         10:00 (19)         10:00 (19)         10:00 (19)         10:00 (19)         10:00 (19)	Due Date Requested:           TAT Requested (days):           PO #           100004032           WO #           Project #           16008378           SSOW#           Sample Date           Time           Sample Date           Time           Sample Date           Time           VO 1             Sample Date           Sample Time           VI / 05 / 19           10: 25           Water           12: 30           Water           14: 05           Vater           14: 05           Water           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V	Due Date Requested:       TAT Requested (days):         STD         PO #         100004032         W0 #	Due Date Requested:     Interpretendent interpreten	Due Date Requested:     Image: String of the s	Due Date Requested:         Allow at the second days):         Allow at the second days days days days days days days day	Due Date Requested:         All         All	Due Date Requested:         Ar           TAT Requested (days):         ST D           PO #         (G) Unput estimation of the second of t	Due Date Requested:         Analys           IAT Requested (days):         ST D           PO#         (a) U up pression           100004032         (b) U up pression           WO #         (a) U up pression           Project #         16008378           SSOW#         (a) U up pression           Sample Date         Sample Type (C=comp, C=green, compared on the	Analysis F         Due Date Requested:       Intervalue (days):         STD       Intervalue (days):         PO#       (a) full up the a'regime of the part of	Analysis Requester           Due Date Requested:         ITAT Requested (days):         Ital Requested (days): <th< td=""><td>Due Date Reguested:         Analysis Requested           TAT Requested (days):         STD           Post         (d) up up us (transmitted)           Post         (d) up up us (transmitted)           Post         (d) up up us (transmitted)           Propertial         (d) up up us (transmitted)           Properit         (d) up us (transmitted)           Properit         (d) up us (transmitted)           Properit         (d) up us (transmitted)           Sample Date         Sample (transmitted)           Time         (transmitted)           (transmitted)         (trans</td><td>Analysis Requested           Due Date Requested::         Analysis Requested           TAT Requested (days):         ST D           Popel 100004032         Non upper second seco</td><td>Analysis Requested         Due Date Requested:         Analysis Requested         Analysis Requested         Analysis Requested         Analysis Requested         N D         N D         N D         No #         Project #         Colspan="2"&gt;No #         Somple Matrix         Sample Date Tripe       No #       No D       A       N D         Sample Date Tripe       Sample Date Tripe       N D       S       D       A       N D       S         Sample Date Tripe       Sample Date Tripe       N D       S       D       A       N D       S       S         Sample Date Tripe       Sample Matrix       Sample Date Tripe       Sample Date Tripe       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix</td></th<>	Due Date Reguested:         Analysis Requested           TAT Requested (days):         STD           Post         (d) up up us (transmitted)           Post         (d) up up us (transmitted)           Post         (d) up up us (transmitted)           Propertial         (d) up up us (transmitted)           Properit         (d) up us (transmitted)           Properit         (d) up us (transmitted)           Properit         (d) up us (transmitted)           Sample Date         Sample (transmitted)           Time         (transmitted)           (transmitted)         (trans	Analysis Requested           Due Date Requested::         Analysis Requested           TAT Requested (days):         ST D           Popel 100004032         Non upper second seco	Analysis Requested         Due Date Requested:         Analysis Requested         Analysis Requested         Analysis Requested         Analysis Requested         N D         N D         N D         No #         Project #         Colspan="2">No #         Somple Matrix         Sample Date Tripe       No #       No D       A       N D         Sample Date Tripe       Sample Date Tripe       N D       S       D       A       N D       S         Sample Date Tripe       Sample Date Tripe       N D       S       D       A       N D       S       S         Sample Date Tripe       Sample Matrix       Sample Date Tripe       Sample Date Tripe       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix       Sample Matrix

## Chain of Custody Record

Environment Testing TestAmerica

4

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

Client Information	Sampler J. BARNY	HART	Lab Aw:	PM: alt, Jay	yna K					Carrier Trac	king No(s)		COC No. 160-8613-4372.1	
Client Contact: Michelle Cho	Phone: 904. 85		E-M jayr	ail: na.awa	alt@te	estam	erica	inc.co	m				Page Page 1 of 1	
company Seosyntec Consultants, Inc.				Τ				Ar	nalvsis F	Requested			Job #:	
Address	Due Date Requested:		()			T	T						Preservation Codes	;
130 Stone Road West	TAT Requested (days):	h 155787		-									B - NaOH N	I - Hexane I - None
Guelph State, Zip							də	CP)					D - Nitric Acid F	- AsNaO2 - Na2O4S
ON, N1G3Z2	PO#						- single rep	and Mn (ICP)					F - MeOH F	) - Na2SO3 ! - Na2S2O3
Phone.	100004032			0	e only		C) - Si	e and					H - Ascorbic Acid T	- H2SO4 - TSP Dodecahydrate
Email: mcho@geosyntec.com	WO #			Sor	r No) - Sulfate only	(ICP)	Total (TOC)	als - F				s.	J - DI Water	I - Acelone / - MCAA V - pH 4-5
Project Name: NAS Jacksonville Project TR0673	Project # 16008378			e (Yes	S OF	fur (IC		d Met				containers		- other (specify)
Site: NAS-JAX	SSOW#			ample	D (Ye	tal Sul	Carbon,	solve				of con	Other:	
		Sample Type	(W=water, S=solid.	Filtered S	Perform MS/MSI	200.7 DOD5 - To	nic	200.7_DOD5 - Dissolved Metals - Fe				Total Number of		
Sample Identification		ample (C=com Time G=grat	P, O=waste/oil, ) BT=Tissue, A=A	Field	Perform	200.7	9060/	200.7				Tota	Special Inst	ructions/Note:
		Prese	vation Code:	X	XN	D	S	D		6.5 24 S.C				
EKMW-11	11 19 2017 12	450 (7	Water	N	>	( ×	X	×				5		
EKMW-12	15	523 (7	Water	2	>	×	×	۶				6		
EKMW-13B	16	558 6	Water	۲	×	×	×	X				6		
EKMW-14	10	635 G	Water	N	×	×	×	×		1		6		
DUP-01		- 6	Water	2	>	×	×	X				6		
DUP-01 FIELD BLANK	16	50 G	Water	2	7	XX	×	×				6	,	
			Water											
			Water					-						
				++		-	-	+						
160-36445 Chain of Custody				+			+	+						
Possible Hazard Identification				4	Sami		isnos	al ( A	fee may	he assessed	l if samples	are retain	ned longer than 1 r	nonth)
	Poison B Unknown	n 🖾 Radiolog	ical	_		Retu	im To	o Cliei		Disposal I			hive For	_ Months
Empty Kit Relinguished by:	Da	ite.		Tin	ne:	_	_	_		Met	nod of Shipmer	nt.		
Relinquished by. J. BARNHART A. B.W.	Date/Time: /	10:30	Company	1	ANSS-CL	eceiye	d by:	r	ILK		Date/Ti	me: 11/2	1/19 0900	Company
Relinquished by:	Date/Time.		Company	-	R	eceive	d by:		C		Date/Ti			Company
Relinquished by:	Date/Time:		Company		R	eceive	d by				Date/Ti	ime:		Company
Custody Seals Intact: Custody Seal No.: ∆ Yes ∆ No	· · · · · · · · ·				C	ooler	Tempe	rature(s	s) ^o C and Oth	er Remarks,				Ver: 01/16/2019

#### Eurofins TestAmerica, St. Louis 13715 Rider Trail North

Chain of Custody Record

Environment Testing TestAmerica

Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

Client Information Client Contact: Michelle Cho	Josh B.	cruher	T												160-8668-4400.	1
Michelle Cho	0.11	858 -		E-Mai	t, Jayr						-				Page:	1
Company:	904 -	050 -	1010	jayna	awalt	@tes	tame	ricair	ic.com		1				Page 1 of 1	
Geosyntec Consultants, Inc.									Ana	lysis R	equested				Job #:	
Address: 130 Stone Road West	Due Date Requeste	ed:													Preservation Co	les:
City.	TAT Requested (da	ys):		100											A - HCL B - NaOH	M - Hexane N - None
Guelph State, Zip:		STD					(d		a					1	C - Zn Acetate	O - AsNaO2
ON, N1G3Z2		310					Mn (ICP)		lle re					100	D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3
Phone:	PO #: 100004032					A.	W pu		sing					3	F - MeOH G - Amchior	R - Na2S2O3 S - H2SO4
Email	WO #:				(oN	Sulfate only	Metals - Fe and		- () OC) -					1	H - Ascorbic Acid	T - TSP Dodecahydrat U - Acetone
mcho@geosyntec.com					s or No)	Sulfa	als -	(d)	al (T					2	L - DI Water	V - MCAA W - pH 4-5
Project Name: NAS Jacksonville Project TR0673	Project # 16008378				e (Ye	- suc	d Met	fur (le	1, Tol					quie	L-EDA	Z - other (specify)
NAS JAX EK TAP	SSOW#				mple O (Ye	- Anic	Dissolved	I Sult	arbor					containare	Other:	
WAS JAK EK INT			r		d Sa	280	Diss	Tota	ic Ci		1		1 1	101	5	r - 11
Sample Identification	Sample Date	Sample Time	Type (w	atrix =water, rsolid, aste/oil, sue, A=Air)	Field Filtered Sample ( Perform MS/MSD (Yes	300_ORGFM	200.7_DOD5 -	200.7_DOD5 - Total Sulfur (ICP)	9060A - Organic Carbon, Total (TOC) - single rep		k			Total Numbe	Į.	structions/Note:
	>	$>\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	Preservation (	Code:	$\times$	N	D	D	s					D		
EKMW-11	12/03/19	11:25	G W	ater	NN	1	1	1	3						8	
EKMW-12		12:05	G W	ater	11	1	1	1	3				Custody			
EKMW - 13B		13:47	G W	/ater		1	1	1	3		<b>-</b>					
EKMW - 14		14:45	G W	/ater		l	1	1	3				Chain of			
DUP-01			G W	ater		1	1	1	3				C C C			
FIELD BLANK		12:00	G w	/ater	11	1	1	1	3		<u> </u>		60-36576	10000	NO PRESE	WATIVES UGH BOTTLE SHIPPED
					-						⊥ ■		–  -  -	and Annual D		
					-	-							+	100		
														100		
Possible Hazard Identification	□ _{Poison B} □ _{Unkn}	own	Radiological			F	Return	To	Client		Disposal I		ples are		ned longer than "	Months
Deliverable Requested: I, II, III, IV, Other (specify)					Sp	ecial	Instri	uction	ns/QC	Requiren	nents:					
Empty Kit Relinquished by:		Date:			Time:						Meth	nod of Sh	ipment:	-	1	
Relinquished by:	Date/Time: <u>j2/03/19</u> Date/Time:	17:3	Comp Coo Comp	SUN	ie.	Rece (	eived b	ý	ul	N	hen		ate/Time:	1-19,	10930	Company 77457// Company
Relinquished by:	Date/Time:		Comp	any		Rec	eived b	y:				0	ate/Time:			Company
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No						Cool	ler Ten	nperat	ure(s) °C	and Other	Remarks:			-		I

12/27/2019

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## Chain of Custody Record

Environment Testing TestAmerica

Client Information	Sampler:	ie Zin	ckaref	Lab Pl Awal	M: t, Jayni	аK					Carrier Track	ing No(s)	):		COC No: 160-8697-4420	2
Client Contact. Michelle Cho	Phone: 90	4 - 307	-1500	E-Mail	1:		nericain	C C C	m						Page B2 Page 2012	
Company:		1 0 0	1300	Jayne	a.awaiii	glesia	nencan							-	Job #:	
Geosyntec Consultants, Inc. Address:	Due Date Reques	ted:					1 1	An	alysi	s Req	uested		<del></del>	-	Proponuction C	daai
130 Stone Road West	Due Date Reques	12/2	712019											ALC: N	Preservation Co	M - Hexane
City: Guelph	TAT Requested (c														B - NaOH C - Zn Acetate	N - None
State, Zip:		RU	ISH					rep	t-FF	-				120	D - Nitric Acid	0 - AsNaO2 P - Na2O4S
ON, N1G3Z2 Phone:	PO #:					5		ngle	ng lis					t.	E - NaHSO4 F - MeOH	Q - Na2SO3 R - Na2S2O3
-none.	100004032				0	only		() - Si	- Lor	2					G - Amchlor H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrate
Email: mcho@geosyntec.com	WO #:				or No	Sulfate only	VS)	Total (TOC) - single	etals						I - Ice J - DI Water	U - Acetone V - MCAA
Project Name:	Project #:			-	Yes or N	s - Si	GC/N	Total	CP M	(ICP				containers	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
NAS Jacksonville Project TR0673	16008378				Yes	nion	ocs (		ved lo	ulfur				ntai		z - ouler (specify)
Site NAS JAX EK TAP	SSOW#:				Samp ASD (	28D - Anions - Sulfate only Total Matals - Ionn list (ICD)	- NO	c Carbon,	lissoly	- Total Sulfur (ICP)				of co	Other:	
		<b>C ( ( )</b>	Type (w	atrix =water, =solid,	i Filtered orm MS/N	300_ORGFM_28D - Anions	DOD5	A - Organic	200.7_DOD5 - Dissolved ICP Metals - Long list - FF 200.7_DOD5 - Dissolved Metals - Long list /ICP/	200.7_DOD5 - T		Į		Total Number of		
Sample Identification	Sample Date	Sample Time	(C=comp, O=w G=grab) BT=Tiss	aste/oil, sue, A=Air)	Field F Perfor	300	8260C	9060A	200.7	200.7				Tota	Special I	nstructions/Note:
	$\sim$	$\geq$	Preservation (	Code:		N D	_		D D	the second se		_		X		
EKMW - 11	12/18/19	11:10	G W	/ater		X	X	$\times$		X				RAN		
EKMW - 12		11:50	, w	/ater		X	X	$\times$		X						
EKMW - 12 (MS/MSD)		11:50	w	/ater			X						Custody	and and		
EKMW - 13B		13:45	W	/ater		Х	X	X		X			ں م			
EKMW - 14		14:40	w	/ater		X	X	$\times$		X			Chain			
DUP-01		-	W	/ater		X	X	$\times$		X			87	1220		
FIELD BLANK		15:05	↓   w	/ater		$\times$	$\times$	$\times$		X			60-367			
TRIP BLANK		-	— w	/ater			X						160			
			W	/ater							1	1				
			W	/ater										THE O		
			W	/ater										返		
Possible Hazard Identification					Sar	nple D	sposal	(A)	fee ma	y be a:	sessed if	sampl			ed longer than	1000
Deliverable Requested: I, II, III, IV, Other (specify)	Poison B 💛 Unk	nown I	Radiological				Irn To C				isposal By s:	Lab		Arch	ive For	Months
Empty Kit Relinguished by		Date:		-	Time:						Method	f of Shipr	nent:			-1/
	Date/Time:	1	Comp	any		Receive	d by	1		)		Date	Time C	210	1000	Company
Bry gay beory	Date/Time:	14:		osyn	tec	40	the	U,	1	Ur			9 2.	1-19/	1100	Company TASH
Relinquisted by.	Date/Time:		Comp	any		Receive	d by.					Date	e/Time:			Company
Relinquished by:	Date/Time:		Comp	any		Receive	d by:		_			Date	e/Time:			Company
Custody Seals Intact: Custody Seal No.:					-	Cooler 1	emperatu	re(s)	°C and C	Other Ren	narks:					
Δ Yes Δ No				-		-		_	_	_		_	-	_		Ver: 01/16/2019

12/27/2019

FestAmerica, St. Louis

Jr Trail North

## Chain of Custody Record

eurofins Environment Testing TestAmerica

4

5

.y, MO 63045 314-298-8566 Fax: 314-298-8757	,	Jiam	or ouse	ouyi	Neu	oru											TestAmerica
ient Information	Sampler:	u Zir	<u>1 ckgraf</u> 2 - 150 c	Lat Aw	o PM: valt, Jay	/na K					C	arrier Track	ing No(s):		1	COC No: 160-8697-4420.	1
Dient Contact Aichelle Cho	Phone: 90	4 - 30	2 - 1500	E-N	/ail: /na awa	lt@testa	ameri	icainc c	om							Page: Page 1 of 2	
Company						Ger				-						Job #	
Geosyntec Consultants, Inc.	In nu n				-			A	naly	sis I	Requ	ested			_		
30 Stone Road West	Due Date Request	121	27/201	9	100	15										Preservation Coc	
ity:	TAT Requested (da	ays):				1										A - HCL B - NaOH	M - Hexane N - None
Suelph tate, Zip.		RU	154					a	Ħ							C - Zn Acetate D - Nitric Acid	O - AsNaO2 P - Na2O4S
N, N1G3Z2			5.1					jle re	list	ICP)					53	E - NaHSO4	Q - Na2SO3
hone:	PO #: 100004032					only	list (ICP)	sing	Long	list (ICP)						F - MeOH G - Amchlor	R - Na2S2O3 S - H2SO4
mail	WO #				- No	ate o	list (	00	als -	long					12	H - Ascorbic Acid I - Ice	T - TSP Dodecahydra U - Acetone
ncho@geosyntec.com					S or	Sulfate	long	(GC/MS) Total (TC	Met	- sisi	(d)				s	J - DI Water K - EDTA	V - MCAA W - pH 4-5
roject Name: IAS Jacksonville Project TR0673	Project #. 16008378				(Ye	- Suc	als -	s (G(	d ICP	d Me	fur ()				containers	L - EDA	Z - other (specify)
ite	SSOW#:				mpte	Anions	I Met	VOC	olved	olved	I Sul				cont	Other:	
NAS JAX EK TAP			<b></b>		d Sa	28D	Tota	LL -	Diss	Diss	Tota				er of		
			Sample	Matrix	Field Filtered S	300_ORGFM_28D	200.7_DOD5 - Total Metals - Iong	8260C_DOD5_LL - VOCs (GC/MS) 9060A - Organic Carbon, Total (TOC) - single rep	200.7_DOD5 - Dissolved ICP Metals - Long list - FF	DOD5 - Dissolved Metals - long	DOD5 - Total Sulfur (ICP)				Number of		
		Sample	Type (C=comp,	(W=water, S=solid,	Field Filt	ORG	2_0	DA - O	2_DC	7_D0					al NL		
ample Identification	Sample Date	Time	G=grab)	O=waste/oil, T=Tissue, A=A	Liel Liel	300	200.	8260C 9060A	200.	200.7	200.7	20		1	Total	Special In	structions/Note:
	$\rightarrow$	> <	Preservat	on Code:			A	AS	D	D	D	<u> </u>			X		
EKMW-11	12/10/19	11:10	G	Water	Y				X								
EKMW-12	1	11:50	1	Water	1				X								
EKMW-13B		13:45		Water					X					ustody	1		
EKMW-14		14:40		Water					X					Cust	100		
PZ-07		15:50		Water					X					of			
PW005		16:40		Water					X					Chain			
DUP-01				Water					X					5787	152		
FIELD BLANK	4	15:05	$\downarrow$	Water	V				X					60-367			
		-		Water											a fille		
				Water											20		
				Water													
Possible Hazard Identification					S					may l	_			s are re	etaine	ed longer than 1	month)
Non-Hazard Flammable Skin Irritant	Poison B Unkr	nown	Radiological					To Clie		L		sposal By	Lab		Arch	ive For	Months
Deliverable Requested: I, II, III, IV, Other (specify)					S	pecial Ir	nstruc	ctions/C	2C Re	equire	ement	S.					
mpty Kit Relinquished by:		Date:			Time	9:				0		Method	d of Shipmi	ent			
elinquished by. Br Zuff	Date/Time:	14:	30	Ceos Company	ynte	Receiv	10	- 11/1	V	h	N	Y	Date/	Time J.J.	)-10	7/1100	Company 9471
lelinguished by:	Date/Time:			Company		Receiv	ed by	÷.					Date/	Time.			Company
Custody Seals Intact: Custody Seal No.:						Cooler	Tom	perature(s	2) °C ar	d Ollh	er Dom	a di a					

12/27/2019

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## Chain of Custody Record

Environment Testing TestAmerica

Client Information	Sampler A-5(1)	ANSC	$\sim$	Lab I Awa	PM: alt, Jayı	na K						Carrier T	racking No	(s):		COC No: 160-8737-4435	1
Client Contact: Michelle Cho	Phone: ANU	nnsc	io)	E-Ma			stamo	icala		2		1				Page:	
Company:		5090		Jayii	a.awai	ille	stame	ee	>			1	-			Page 1 of 2 Job #:	
Geosyntec Consultants, Inc. Address:	Due Date Request	ed:				YY	4=4		Ana	lys	is Re	queste	d	1 1			
130 Stone Road West	Due Date Request	ieu.			1	101.00										Preservation Co	
City: Guelph	TAT Requested (d	ays):				1010										A - HCL B - NaOH	M - Hexane N - None
State, Zip:									dau	(ICP)			1		54	C - Zn Acetate D - Nitric Acid	O - AsNaO2 P - Na2O4S
ON, N1G3Z2						1000					uW				20	E - NaHSO4 F - MeOH	Q - Na2SO3
Phone:	PO #: 100004032				-	only			- sin	- Fe and Mn	and M					G - Amchlor	R - Na2S2O3 S - H2SO4
Email:	WO #:				NO)	fate d			(DC)	8	Mn (ICP)					H - Ascorbic Acid	T - TSP Dodecahydrate U - Acetone
mcho@geosyntec.com Project Name:	Project #:				S OL	- Sulfate	(CP)	CIMS	tal (1	tals	Sulfur, Total Fe Metals - Fe, Mn (				SIS	J - DI Water K - EDTA	V - MCAA W - pH 4-5
NAS Jacksonville Project TR0673	16008378				e (Ye:	9	fur (	s (G	n, To	d Me	fur, als -				containers	L - EDA	Z - other (specify)
Site:	SSOW#:				SD (Y	D - Anions	tal Sul	- 100	Carbon, Total (TOC)	ssolve	- Total Sulfur, Tota - TotalMetals - Fe,						
		Sample	Sample Type (C=comp,		Field Filtered Sample ( Perform MS/MSD (Yes	300_ORGFM_28D	200.7_DOD5 - Total Sulfur (ICP)	8260C_DOD5_LL - VOCs (GC/MS)	9060A - Organic (	•	200.7_DOD5 - To 200.7_DOD5 - To				Total Number of		
Sample Identification	Sample Date	Time		BT=Tissue, A=Air)	Pe T	7	- maintain and and		100 110 TO 10 10 TO	10.10 511	-	-		1 1	10	Special Ir	structions/Note:
FULLIN			and the second second second	T	P	N	DA		S D	D	D						
EXMINIT	1720	1412	6	Water	K	1	1	3	31		_						
EKUW-12 +(16(13D)	15/20	1455	6	Water	XX	11	15	2	3						12		
EKUW-11 EKUW-12 + (LO/NSD) EKUW-13B EKUW-14	1800	1310	C	Water	X	1	1	3:	31						100		-
EK1110-14	18:00	1255	G	Water	K	1		-	31					₹	- Carlo		
Dul-01	11000	-	G	Water	X	1		-	31					Custody	1		
Field BIGUNK	11-1-1-	1340	C	Water	f)	1		3	2 1		-			of O	100	4. 2	Contrine 24
HEAD BIOLIN	117/20	1340	0	Water		╨	-	26	1	-				ai.	201	4 marcar	3 container Contracted on
	1.1					-		-	-	-		- 2		5	12		
				Water										6922	11		
				Water										60-36	B		
				Water								1 =		10	1000		
				Water				+		+	-	1	TI	1 +	253		
Possible Hazard Identification	1				- Sa	mnle	Dispo	leal	( A fo	0 000	av bo	250000	d if com		rotain	ed longer than 1	
Non-Hazard Flammable Skin Irritant Po	son B 🖂 Unkn		Radiologica	ə/			eturn	To C	lient	e me		Disposal				nive For	202 (D)
Deliverable Requested: I, II, III, IV, Other (specify)				4	Sp		Instruc			Requ	uireme	nts:	by Lab		AIG		Months
mpty Kit Relinquished by:		Date:			Time:			-		-		Me	hod of Shij	oment:			
Relinquished by:	Date/Time;	> 1730	()	Company GLU		Rece	ived by:	1	2/				Da	te/Time: ・ ?・	0.	0	ETAST
Relingoished by:	Date/Time:	////		Company		Rece	ived by:		_					te/Time:	10	9100	Company
/ Relinquished by:	Date/Time:	-							-								
	Pater mile.			Company		Rece	ived by:						Da	te/Time:			Company
Custody Seals Intact: Custody Seal No.:						T	112.5			-	Other R				_		

## Chain of Custody Record

Environment Testing TestAmerica

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

Client Information	Sampler: ByG	e Zinck	graf	Lab PM: Awalt,		к		-			Ca	rrier Track	ng No(s):			COC No: 160-8807-4469.	2
Client Contact: Michelle Cho	Sampler: BYC Phone: Go	4-302-	1500	E-Mail: jayna.a	awalt@	testa	nerica	inc.co	om							Page: Page 2 of 2	ofl
Company Geosyntec Consultants, Inc.										cic F	Ream	ested				JOD # TROK	
Address:	Due Date Reque	ested:		. 8	2484		1			515 1	lequi	Sieu			2	Preservation Co	
130 Stone Road West City:	TAT Requested	(davs):														A - HCL B - NaOH	M - Hexane N - None
Guelph	and a start of the second	ST	D						â							C - Zn Acetate	O - AsNaO2
State, Zip. ON, N1G3Z2		31		1000				gle rep	n (ICF	_					1000	D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3
Phone:	PO#: 100004032		0	1 PULLE		only		- sing	and Mn (ICP)	and Mn	(H)				Party and	F - MeOH G - Amchlor H - Ascorbic Acid	R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrat
Email:	WO #.			L NO		lfate	s)	(TOC)	- Fe	e l	Mn (I				中国	I - Ice J - DI Water	U - Acetone V - MCAA
ncho@geosyntec.com Project Name:	Project #:				or No	Anions - Su	(GC/MS)	Fotal (	fetals	, Total	- Fe,				ners	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
NAS Jacksonville Project TR0673	16008378 SSOW#:	V			Yes	nion	- VOCs (	pon,	ved N	Sulfur,	letals				containers	Other:	2 • other (specify)
NAS JAX EK TAP	33000#.	1° -		Sam	) dsv	8D - A		c Carl	- Dissolved Metals	- Total S	- TotalMetals - Fe, Mn (ICP)			1	of	Other.	
	1.1.1.1		Gumpie	atrix	Perform MS/M	300_ORGFM_28D - Anions	8260C_DOD5_LL	- Organic	D- 50	05 - 1		1 1	11	1.	Number	Star .	
		Sample	s s s	=water, =solid, raste/oil,	E E	ORG		0- V0	200.7_DOD5	200.7_DOD5	200.7_DOD5			T	al Nu	1.0	
Sample Identification	Sample Dat		G=grab) BT=Te	sue, A=Air)	A 1	and the second	and statist	9060A	1 1	-					Total	Special In	structions/Note:
	~	12:25	Preservation	Jode: X /ater	Y	V D		-	D	D	D			05	X		
EKMW-11	1/28/202			-	+	1 1	3	-	1	1	-			_	127		
EKMW-12		14:05		/ater		1	13	3	l	ι				Custody	Control of the		
EKMW-12 (MS/MSD)		14:05	V	/ater	X		3										
EKMW-13B		14:45	V	/ater		1	1 3	+	1	(	2			Chain of		-	· · · · · · · · · · · · · · · · · · ·
EKMW - 14		15:50	V	/ater		1	3	3	1	1				Cha			
FLELD BLANK		16:15				1	12	2	l	1				.092	ALC: NO	WATER	ENT DI PROVIDED
DUP-01	1	· —				1 1	3	3	l	1				60-37092	PACE PA	14	
TRIP BLANK	-						3					-		10	al Ha		
										-	-	11	11	-		6 ( ¹ ) - X	
		-						1							100		
								1							100		2.50 - 18 Ab
Possible Hazard Identification			JI		Sam					may I	be ass	essed if	sample	s are re	etain	ed longer than 1	month)
Non-Hazard Flammable Skin Irritant Poi Deliverable Requested: I, II, III, IV, Other (specify)	son B Ur	nknown	Radiological				um To			L	Dis	oosal By	Lab		Arch	ive For	Months
and a second						cial in	structio	ons/G	IC RE	equire	ments	-					
Empty Kit Relinquished by:	Date/Time:	Date:	Com		Time:	Pocoivo	d by:			0		Method	of Shipme			1	Composed 4.4
Relingershed by:	1/20/20	120 18	: 30 G	cosur	Acc		d by	de	~	KA	m	-	Date	Гіте: - 29 -	-20	1/0250	Company
Relinquisted by:	Date/Time:		Com			Receive	d by:						Date/	lime:		,	Company
Relinquished by:	Date/Time:		Com	any	F	Receive	d by:						Date/	Time:			Company
Custody Seals Intact: Custody Seal No.:					0	Cooler 1	empera	ature(s	) °C ar	nd Othe	er Rema	rks		1	-		
Δ Yes Δ No					1												

## Chain of Custody Record

eurofins Environment Testing TestAmerica

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

Client Information	Sampler A TU	1-30	n	Lab Pl Awal	M. t, Jayr	na K		1				Carrie	er Trac	king No(s	):		COC No 160-8838-4488.	3
Client Contact Michelle Cho	Phone: 904495	14-	~	E-Mail		t@tes	tame	ericaino	c cor	m		1					Page Page 3 of 4	
Company:	10195	V I m		Jujie		(Groc	Junic				-	1		2.42	-	-	Job #:	
Geosyntec Consultants, Inc. Address.	Due Date Requested:				100	1			An	alysi	s Ree	ques	ted		T T	1000	Preservation Coc	los:
130 Stone Road West					1				1								A - HCL	M - Hexane
City: Guelph	TAT Requested (days	5):									(d)					33	B - NaOH C - Zn Acetate	N - None O - AsNaO2
State, Zip: ON, N1G3Z2								e rep		(ICP)	Mn (ICP)						D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3
Phone:	PO #:					A		single	1	um b	and					100	F - MeOH G - Amchlor	R - Na2S2O3 S - H2SO4
Email	100004032 Wo #:				(0)	te on		- ()		- Fe and	- Fe	Mn (ICP)	(sq	only			H - Ascorbic Acid	T - TSP Dodecahydrate
mcho@geosyntec.com	1000 #				Yes or h or No)	Sulfat	â	al (TO	(WS)	etals - F	letais	e, Mn	d (Ti	dium		\$	J - DI Water	U - Acetone V - MCAA
Project Name NAS Jacksonville Project TR0673	Project #: 16008378		2004/10/00		(Yes	- su	Sulfur (ICP)	. Tota	(60	Meta	red N	ls - F	solve	· So		ainer	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
Site:	SSOW#:				ered Sample ( MS/MSD (Yes	0 - Anions - Sulfate only	tal Sulf	9060A - Organic Carbon, Total (TOC) - single rep	8260C_DOD5_LL - VOCs (GC/MS)	200.7_DOD5 - Dissolved Metals - Fe and Mn (ICP) 200.7_DOD5 - Total Sulfue Total Fe and Mn	200.7_DOD5 - Field Filtered Metals - Fe	TotalMetals - Fe,	Solids, Total Dissolved (TDS)	Metals (ICP/MS) - Sodium only		f containers		
			Sample M	atrix	MS/MS	300_ORGFM_28D	200.7_DOD5 - Total	ganic	DS_LL	05 - Disso	05 - Fie	1 1	ilds, T	etals (IC		Number of		
			IYPC S	=water, =solid,	Filte	DRGF	DOd	N-01		DOD5	Dod	DOD5				NUN		
Sample Identification	Sample Date	Sample Time	(C=comp, O=w G=grab) BT=Tis	/aste/cil, sue, A≠Air)	Field Filt Perform	300_0	200.7	10906	82600	200.7	200.7	200.7	2540C	6020B		Total	Special In	structions/Note:
		$>\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	Preservation (	Code:	XX	N	D	S A		DC	D	1 1		D	183 23	X		
EKLUN-11 EKLUN-13 EKLUN-13B EKLUN-14 Field Pleunk Field Dup	2/11/201	135	6 W	later	1	X	×	$\times$	$\langle$		X		1	1				
EKLUN-12	1	215	J W	/ater	V/V	X	X	X	X		X						*NBN	ISD (VOLS)
EVLUW-13B	4	445	w N	late:	1	×	X	XX	$\leq$		X					No.	ŀ	
FKLUN -14		555	N N	/ater	1	X	X	XY	4		X					10 PE		
Field Preuse		555	W	/ater	Λ	X	X	XX	A		X					2		
Field Dup.	4	-	y w	/ater	V	X	X	XY	$\langle$		X					Custody		
,,			Ŵ	/ater							1					of		
			W	/ater												Chain		
-			W	/ater														
			W	/ater												60-37224		
			W	/ater												16(		
Possible Hazard Identification					Sa	mple	Disp	oosal (	Af	ee ma		sses	sed .		4101	etain	ed longer than 1	month)
Non-Hazard Flammable Skin Irritant     Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unknov	wn 🗀 F	Radiological					To Cl					sal B	/ Lab		Arch	hive For	Months
					Sp	ecial	Instru	uctions	s/QC	Requ	ireme	nts:						
Empty Kit Relinquished by:		ate:			Time:								Metho	d of Shipn	nent:		/	
Relinquished by	Date/Time:	(20)	7250 Comp	any Ne	2	Rece	The db	ily	Ir	,7	Inc	M	/	Date	Time:	. 13-	29/0835	Company A D
Relinquished by:	Date/Time:	20	Comp	any		Rece	eived b	y O	a	V	MO			Date	/Time:		7000	Company
Relinquished by:	Date/Time:	-	Comp	any		Rece	eived b	у.	-			- 194-7		Date	/Time:		14 - E	Company
Custody Seals Intact: Custody Seal No.:	-					Coole	er Terr	perature	e(s) °	C and C	Other Re	emarks						
Δ Yes Δ No				120		1												

Eurofins TestAmerica, St. Louis 13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## **Chain of Custody Record**



w eurofins

Environment histing Test

Client Information	Brug	Zinck	aval	Aw	PM; alt, J	ayna	a K		160	-373	388 (	Chai	n of	Cus	tody					CDC No. 160-8838-4488.1	
Client Contact: Michelle Cho	Phone: 900	4-302	-1500	E-M	ail: na.av	walt(	Øtes	tame	ericai	inc.c	om		_							Page: Page 1 of 4	
Company: Geosyntec Consultants, Inc.										A	naly	sis	Rec	que	stea	1				TROG	23
Address: 130 Stone Road West	Due Date Request	ed:																		Preservation Code	
City: Guelph	TAT Requested (d	iys):		_		6							6						- 1	A - HCL B - NaOH	M - Hexane N - None
State, Zip:		STĪ	>			8			de		G		Mn (ICP)							D - Nitric Acid	0 - AsNaO2 P - Na2O4S
ON, N1G3Z2	PO #			_	-11				Ingle		Mn (ICP)	ş	N put							E - NeHSO4 F - MeOH	Q - Na2SO3 R - Na2S2O3
	100004032				- 0		e only		• 5		e and	Pue	Ē.	(ICP)	6	Auo					S - H2SO4 T - TSP Dodecahydrate
Email: mcho@geosyntec.com	WO #				e (Yes or No	10	- Sulfate	6	E	(9N)	ia - Fe	tal Pa		Fe, Min (ICP)	Ë	- Sodium only				I - Ice J - DI Water	U - Acetone V - MCAA
Project Name: NAS Jacksonville Project TR0673	Project #: 16008378				Ľ	5	- 80	ur (IC	, Tota	(GC/MB)	Meta	ur, To	N Per	14		-			Iner	K-EDTA L-EDA	W - pH 4-5 Z - other (specify)
SHE NAS JAX EK TAP	SSOW				ample	D (Yei	- Anio	tal Sulf	Carbon	- 1001	bevicer	tai Sulf	old Filte	tal Meta	otal Dia	CP/MS)			of containers	Other:	
Sample Identification	Sample Date	Sample Time			Field Filtered S	Partorn MBMK	300_ORGFM_28D - Anions	200.7_DOD5 - Total Sulfur (ICP)	8060A - Organic Carbon, Total (TOC) - single	8260C_DOD6_LL - VOC8	200,7_DOD6 - Dissolved Metals	200.7_DOD6 - Total Sultur, Total	200.7_DOD5 - Field Filtered Metals	200.7_DOD5 - TotalMetala -	2540C - Solide, Total Dissolved (TDS)	6020B - Metals (JCP/MS)			Total Number o	Stocial In	structions/Note:
	$\rightarrow$	$>\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$	Preservation		X	$\overline{X}$		D		A		D	D	D	N	D		t	X		
EKMW-II	2125/20	11:10	G	Water	Y	N	X	X	X	X	×										
EKMW-12	- Y	12:00	1	Water	Y	N	X	X	×	Х	X										
EKMW - 13B		12:40		Water	Y	N	X	X	X	X	X				X	X					
EKMW - 13B (MS)		12:40		Water	N	Y				X					<b>_</b>	T					
EKMW - 13B (MSD)		12:40		Water	N	Y				X											
EKMW-14		15:05		Water	Y	N	X	X	X	X	X										
PZ-07		16:00		Water	N	N				Х					X	X			đ		
PW005		17:05		Water	N	N				X					X	X					
FIELD BLANK		14:00		Water	N	N	X	X	X	X	X				X	X					
DUP-01			1	Water	N	N	X	X	X	X	X				X	X					
TRIP BLANK				Water						X				F							
Possible Hazard Identification					-	San	nple	Disp	oosa	I ( A	fee i	may	be a	1558	ssed	l if sa	mples an	e reta	aine	d longer than 1 r	month)
Non-Hazard Flammeble Skin Irritant E Deliverable Requested: I, II, III, IV, Other (specify)	Poison B Unkn	iown 🛄	Radiological	-	_	Spe	LI Re	eturn Instri	To (	Clien ns/O	t C Re	u Janua	amer	Vision nts:	53 <i>1</i>	By La	ab L	J AI	rchi	ive For	_ Months
Empty Kit Relinquished by:		Date:			Tin				_	_		-	-	-	Met	ho hor	Shipment				
Relinquished by	Date/Time:		Con	ipany	-	- 1	Recei	ved b	Y	-	-	-	_	-					_	040.	Company
Relinguished by: Physical American	2/26/202 Date/Time:	0 12		COSY	٨t	ч.С.	Recei	2	~	-	-			_		_	22	7.	2	8 855	Company ASR
Relinguished by:	Date/Time:			vparvy			Recei		_		_		_		_	_					
			Con	nyolli ty				veu o	γ. 								Data/Time:				Company
Custody Seals Intact. Custody Seal No Δ Yes Δ No							Coole	r Ten	peral	ure(s)	°C ar	nd Oth	er Re	mark	8						
		_			_	-	_	-	-	-	-		_	-	_	-		_	_		Ver: 01/16/2019

4

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

#### Chain of Custody Record

1	eu	ro	fin	S

Environment Testing	
Test/America	

Sampler Lab PM Carrier Tracking No(s) COC No. **Client Information** Asonson Awalt, Jayna K 160-8943-4537.3 Client Contact E-Mail hone 904-4-20 4242 Page Michelle Cho jayna awalt@testamericainc.com Page 3 of 3 Company Job # Geosyntec Consultants, Inc. Analysis Requested Address Due Date Requested: Preservation Codes: Alter 130 Stone Road West A - HCL M - Hexane City: TAT Requested (days): B - NaOH N - None Guelph Metals - Fe and Mn (ICP)  $\gamma_{(ICP)}$ C - Zn Acetate O - AsNaO2 State, Zip rep D - Nitric Acid P - Na204S ON, N1G3Z2 E - NaHSO4 Q - Na2SO3 Organic Carbon, Total (TOC) - single Mn F - MeOH R - Na2S2O3 Phone PO # (ICP) G - Amchlor S - H2SO4 300_ORGFM_28D - Anions - Sulfate only 100004032 Total Sulfur, Total Fe and H - Ascorbic Acid T - TSP Dodecahydrate 200.7_DOD5 - Dissolved Metals - Fe Email WO # I - Ice U - Acetone Nn DOD5_LL - VOCs (GC/MS) 5 Perform MS/MSD (Yes or No) J - DI Water V - MCAA mcho@geosyntec.com 200.7_DOD5 - Total Sulfur (ICP) é. containers K - EDTA W - pH 4-5 Project Name Project # Field Filtered L - EDA TotalMetals -Z - other (specify) 16008378 NAS Jacksonville Project TR0673 SSOW# Other: ^{to} **Total Number** 200.7_DOD5 -Matrix 200.7_DOD5 -0005 Sample (W=water, Type 9060A - 0 S=solid, 8260C_ 200.7 Sample (C=Comp, O=waste/oil Sample Identification Sample Date Time G=grab) BT=Tissue, A=Air) Special Instructions/Note: Preservation Code: S A DD N D D D ELLUN-11 ELLUN-13 ELLUN-13B ELLUN-14 Field Blanch Field Bup 3/10/20 Water X 1040 0 *houd VOCS *hould VOCS *houd VOCS 1125 1325 MAC IUN 4 * Mold VOCS Ł -160-37531 Chain of Custody Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological Archive For Return To Client Disposal By Lab Months Special Instructions/QC Requirements: Deliverable Requested: I, II, III, IV, Other (specify) Method of Shipment Empty Kit Relinguished by Date: Time: BINDON 1730 Geo Received by Date/Time Relinguished by Company FE Relinquished by Received by Date/Time Company FE 3/11/2020 1635 ETA STL Date/Time Company Relinquished by ompany Cooler Temperature(s) °C and Other Remarks Custody Seals Intact: Custody Seal No. ∆ Yes ∆ No

Ver: 01/16/2019

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## Chain of Custody Record

4

5

Environment Testing TestAmerica

Client Information	Sampler 6	3 <u>AZNH</u> 4) ZZG	ART	La	ib PM. walt, J.	avna k	2				1		Carrie	r Track	ing No(s	5)		COC No.	
Michelle Cho	Phone:	4)2760	lace	E-	Mail													160-8982-45 Page:	50.2
Company Geosyntec Consultants, Inc.		+) cae		Ja	yna.av	/alt@t	estan	nerica	ainc.c	com			1	-	-	-	-	Page 2 of 3	
Address	Due Date Reque	sted		-	+	-			A	nalys	sis I	Req	uest	ed				Job #	
130 Stone Road West City															1			Preservation (	Codes:
Guelph	TAT Requested (	days):			-11				1				-		1	1 1		A - HCL B - NaOH	M - Hexane
State, Zip: ON, N1G3Z2								da		(d			Mn (ICP)				100	C - Zn Acetate	N - None O - AsNaO2
Phone	PO #:							gle re		and Mn (ICP)	-	1	uW p			11		D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3
	100004032					vino		- sin		N pu	and Mn	(d	- Fe and					F - MeOH G - Amchlor	R - Na2S2O3 S - H2SO4
mail: mcho@geosyntec.com	WO #				NN			TOC)	6		Fea	In (IC	ls - P				3	H - Ascorbic Acid	I T - TSP Dodecahydrate U - Acetone
Project Name:	Project #			-	es o	D (Yes or No) - Anions - Sulfate	(ICP)	otal (	C/W	etals	Total	Fe, N	Meta		i.			1 - DI Water	V - MCAA
NAS Jacksonville Project TR0673	16008378 SSOW#:	-			le (Y	es o ions	lfur	n, To	Cs (G	ed Me	Ifur,	- sie	ered				Containore	L - EDA	W - pH 4-5 Z - other (specify)
	53000#				amp	A- Ar	tal St	Carbo	- VO	solve	al Su	- TotalMetals - Fe, Mn (ICP)	III P		5.1			Other:	
Sample Identification		Sample	Sample Type (C=comp	(w=water, S=solid, O=waste/oil.	Field Filtered S	300_ORGFM_28D	200.7_DOD5 - Total Sulfur (ICP)	9060A - Crganic Carbon, Total (TOC) - single rep	8260C_DOD5_LL - VOCs (GC/MS)	200.7_DOD5 - Dissolved Metals - Fe		200.7_DOD5 - Tot	200.7_DOD5 - Field Filtered Metals				I Number of		
	Sample Date	Time	G=grab)	BT=Tissue, A=A ation Code:		1					-	200	200				Total	Special	Instructions/Note:
EKMW-11	03/24/20	$ \frown $		1	Y	N	D	S	A	DC			)						
EKMW-11 EKMW-12 EKMW-13B EKMW-14 DUP-01 FIELD BLANK	05/24/26	1335	67	Water	++-	X	X	X	x		_	1	X	-			9	10	
EV MIAL-13 D		1414		Water	++	X	X	x	×	_		-	X	-			9	9	
EXMW-10		1452		Water		X	X	×	×		_	2	<				9	HOLD VOC	ANALYSES
DuB-Si		1540		Water	11	X	X	×	×				×				9		C ANALYSES
E a 2		-		Water	++	X	X	×	×				×				9	HOLD VO	C ANALYSES
HELD BLANK		1015	X	Water		X	×	×	×				$\langle  $				9		
				Water								1					120		-
				Water	T				-		T	1	-	-			158		
				Water	$\square$						1	+	1	+		-	194		
				Water				-	-	-	+	+	+	-					
				Water				-	-	+	+		+	-	++		15		
ossible Hazard Identification				_	- Sc	mple	Disn	lean	105	00 000				1		_			
Non-Hazard Flammable Skin Irritant	Poison B Unkn	own 🗆 A	Radiologica	L		$\square_R$	eturn	To C	lient	ee ma	y be	ass Die	essed bosal	d If S	amples	s are r	etain	ed longer than	
					Sp	ecial	nstru	ictions	s/QC	Requ	irem	ents	Josai	by Li	aD		Arch	ive For	Months
mpty Kit Relinquished by:		Date:			Time:				-		-	_	Met	had of	Shipme	at			
elinquished by	Date/Time			Company	1		ved by	6		-					Date/Ti	6971) 			12
linquished by	03 25 2 Date/Time	/ 1Z .		Company	EC.	Deer			FE	_									Company
Inquished by	Prince and a			company		Recei	ved by	1	V	2		•			Date/T	me: 2 <b>6/20</b>		10.00	Company
	Date/Time:			Company	-	Hacei	red by		l	V	L	-			Date/Ti	me:	20	10:08	ETA STL
Custody Seals Intact: Custody Seal No.:	and the second se	-																	

13715 Rider Trail North Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

## Chain of Custody Record

1

4

Client Information	Sampler: B.	Sampler: B. Zinckgrof Phone: 904-302-1500				o PM: valt, Jayna K fail: rna.awalt@testamericainc.com								acking	No(s)				COC No: 160-9009-4556,1		
Client Contact Michelle Cho	Phone 90																		Page Page 1 of 💋 (		
Company. Geosyntec Consultants, Inc.					1				Ar	nalys	is R	ane	ster	1			1	_	JOD# TROG	73	
Address 130 Stone Road West	Due Date Reque	Due Date Requested:											1					50	Preservation Co		
City:	TAT Requested	TAT Requested (days):				Child of						_			itrate		Fe		A - HCL B - NaOH	M - Hexane N - None	
Guelph State, Zip		STD						rep		(ICP)	10011				ride,N		Na, B, F		C - Zn Acetate D - Nitric Acid	O - AsNaO2 P - Na2O4S	
ON, N1G3Z2 Phone:	PO #:							ngle r			Wu				Chloi		Si,	100	E - NaHSO4	Q - Na2SO3 R - Na2S2O3	
	100004032	100004032				U (Tes or No)		C) - si		e and	and		(S)	only	ioride		Mg, Ca,	133	G - Amchlor H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrat	
^{Email:} mcho@geosyntec.com	WO #.	WO #.					(d	al (TO	(WS)	IIs - F	otal Fe	e, Mn	d (TC	- Sodium only	ite,Flu		ls - M	1	I - Ice J - DI Water	U - Acetone V - MCAA	
Project Name: NAS Jacksonville Project TR0673	Project # 16008378	Project # 16008378				S OF NO)	fur (IC	n, Tota	s (GC)	d Meta	fur, To	als - Fi	ssolve		Sulfa	s	Meta		K - EDTA L - EDA		
NAS JAX EK TAP	SSOW#						tal Sul	Carbor	- 100	ssolved	tal Sul	talMeta	otal Di	CP/MS	0 - Diss	9060_Diss	ssolved	of cont	Other:		
Sample Identification	Sample Date	Sample Time	Type (	Aatrix W=water, S=solid, =waste/oil,	field Filtered S	PERTORN MIS/MISU (Tes	200.7_DOD5 - Total Sulfur (ICP)	9060A - Organic Carbon, Total (TOC) - single	8260C_DOD5_LL - VOCs (GC/MS)	200.7_DOD5 - Dissolved Metals - Fe and	200.7_DOD5 - Total Sulfur, Total Fe and Mn	200.7_DOD5 - TotalMetals - Fe	2540C - Solids, Total Dissolved (TDS)	6020B - Metals (ICP/MS)	300_ORGFM_28D - Diss Sulfate,Fluoride,Chloride,Nitrate	9060_DC_DIC, 90	200.7_DOD5 - Dissolved Metals -	Total Number o	Creation		
Sample toethineation			Preservation		X	N		100 CO.	Surface and			-	N	D		Other Inter	R D	X	Special In	structions/Note:	
EKMW-11	4/07/20	12:50	G	Water	11	J	11	3	3	1											
EKMW-12	1	13:45	1	Water	Yr	11	1	3	3	l								1			
EKMW-13B		14:30		Nater	YI	1	1 1	3	3*	1				1				1	HOLD V	oCs	
EKMW - 13B (MS/MSD)		14:30		Water	N	Y			6									07	MS/MSD		
EKMW-14		15:30	,	Water	41	J	11	3		1		1	1					R			
FIELD BLANK		16:00		Water	NI	V	1 1	3	3*	1		1						50	+ HOLD	VOCS	
FIELD DUP-01	4	-	+	Nater	YI	1	11	3	3	1		1							+ HOLD	VOCS	
and the second second		ومرواب والمحافظ المحافظ والمرافع		Water	Ħ								1								
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160-37773 Ch				Water	11		+		-		-	1	1					1			
Possible Hazard Identification					s						ay be								d longer than 1		
Deliverable Requested. I, II, III, IV, Other (specify)	Poison B Uni	known	Radiological		S		<i>Retur</i> al Inst				uirem	Disp ents:	osal E	By La	b	-	— A	Archi	ve For	Months	
Empty Kit Relinquished by:		Date:			Time	e:				_			Meth	od of	Shipme	ent			and the second second		
Relinquished by R 2 1.1	Date/Time			pany COSY	<u> </u>	Re	ceived	by:					1		Date/	Time:	_			Company	
Relinquished by FED EX	Date/Time				AFCI	-	Received by As :								Date/Time: 4/4/2020				06120	Company	
Relinquished by	Date/Time:		Com	pany		6	ceived	5	1	n	7			-	Date/Time:				09:20	ETA STL Company	
Custody Seals Intact: Custody Seal No.:																					

Chain of Custody Record

4

Earth City, MO 63045 Phone: 314-298-8566 Fax: 314-298-8757

13715 Rider Trail North

Client Information	Sampler RAPUHAZ					, Jayna K							o(s):			COC No: 160-9064-4589.1		
lient Contact Aichelle Cho	Phone:	I JAERHAEI								1						Page. Page 1 of 3		
ompany	(401)220	- (101) 2200- (01) 54- Jayri					await@testamericainc.com							~		Job #.		
eosyntec Consultants, Inc.	Due Date Requested:		1010	152			Ana	alysi	s Re	ques	sted			T	180	Preservation Cod	les'	
30 Stone Road West	Due Date Requested.	Due Dale Requested.											te			A - HCL	M - Hexane	
ity. Suelph	TAT Requested (days):	TAT Requested (days):								(d)	ř.		,Nitra	E		B - NaOH C - Zn Acetate	N - Norie O - AsNaO2	
tate, Zip:			A STATE			rep		(ICP)		and Mn (ICP)			oride	Si Na R Fo		D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3	
N, N1G3Z2	PO #	PO #						and Mn (ICP)		and h			e,Chl	i i		F - MeOH G - Amchlor	R - Na2S2O3	
wire.	100004032		(oN	(Yes or No) Anions - Sulfate only		C) - single		e and	(ICP)	- Fe	(S(	only	lorid	C C	n Sa	H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrate	
nail: icho@geosyntec.com	WO #.	WO #.					(SW	S	Mn .	etals	d (TC	- Sodium only	te, Flu	2.0	s s	I - Ice J - DI Water	U - Acetone V - MCAA	
roject Name	Project #						(GC/	Meta	s - Fe	w pa	solve	- Soc	Sulfa	Mota	containers	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)	
AS Jacksonville Project TR0673	16008378 SSOW#	16008378 SSOW#					/OCs	lved	Metal	Filter	I Dis	(SW)	Diss	Diss	onte	Other:		
ια.						c Car		Disso	Total	field	Tota	(ICP)	80 -	9060	r of c	1		
Sample Identification	Sample Date Time	Sample Type (C=comp, G=grab) Preservation Co	rator, blid, te/oil, e. A=Air)	Perform MS/MS 300_ORGFM_28D	D 200.7_DOD5 - 1			200.7_DOD5 - Dissolved Metals - Fe		D 200.7_DOD5 - Field Filtered Metals - Fe	Z 2540C - Solids, Total Dissolved (TDS)		2 300_ORGFM_28D - Diss Sulfate, Fluoride, Chloride, Nitrate	O 200 7 DODE - Dissolved Metals - Mr	-	Special In	structions/Note:	
			FY	XN		S /				X	N		N IN		1			
EKMW-11 EKMW-12	04/21/20 1400	G Wat		X			X	_	-	-		-	-		190			
EKMW-12	04/21/20 1436	G Wat	ter	X	X	X	X		_	X					1			
EKMLU-13B	04 21 20 1510	G Wat	ter	X	X	X	X			X					1	HOLD VOC	ANALYSES	
EKMW-14	04/21/20 1555	GI Wat	ter	X	X	X	X			X						HPLD VO	CANALYSE	
FIELD DUP. 01	04/21/20 -	GI Wat	ter	Х	X	X	Х			X					STATE OF STATE	HOLD VO	CANALYSES CANALYSE CANALYSE	
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Possible Hazard Identification				Sample	Disp	osal	(Afe	ee ma	ay be	asses	ssed	if san	ples	are r	etain	ed longer than 1	month)	
	Poison B Unknown	Radiological				To C				Dispo					1	nive For	Months	
Deliverable Requested: I, II, III, IV, Other (specify)				Special	Instru	uction	s/QC	Requ	uireme	ents:								
mpty Kit Relinquished by	Date:	and the second second	Tim	ie:						()()()()()()()()()()()()()	Meth	od of S	nipmer	nt.				
elinquished by	Date/Time: 64/22/20 180	Date/Time: Company			Received by: FED EX							ľ	Date/Ti	me:			Company	
FED EX	Date/Time:	Compan		Received by: 0 Man -							Date/Time: 4/23/2020					0840	ETA STL	
elinquished by:	Date/Time:	Compan	у	Received by						4/23/2022 Date/Time:						00-10	Company	
	A PARTICIPAL CONTRACTOR		100			2.575												

### APPENDIX D POINTS OF CONTACT

POINT OF CONTACT	ORGANIZATION	Phone E-mail	Role in Project
Evan Cox	Geosyntec Consultants Waterloo, ON, Canada	519-514-2235 ECox@Geosyntec.com	PI Supervising the project
Dr. David Gent	US Army ERDC Environmental Lab Vicksburg, MS	601-634-4822 David.B.Gent@usace.army.mil	Co-PI Senior technical support
Mark Watling	Geosyntec Consultants Guelph, ON, Canada	519-515-0879 MWatling@Geosyntec.com	Performer Technical design and execution
Dr. David Reynolds	Geosyntec Consultants Pty. Ltd. Surry Hills, NSW, Australia	+61 (0)478 187 62 DReynolds@Geosyntec.com	Senior technical support
Dr. James Wang	Geosyntec Consultants Columbia, MD	410-381-4333 JWang@Geosyntec.com	Senior technical support
Michael Singletary Adrienne Wilson	NAVFAC Southeast Jacksonville, FL	904-542-4204 Michael.a.singletary@navy.mil Adrienne.Wilson@navy.mil	Site Liaison, technical review