



Revision 1

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HYDROGEOLOGIC INVESTIGATION REPORT

**FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

**Prepared For:
Exelon Generation Company, LLC**

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EXECUTIVE SUMMARY

This Hydrogeologic Investigation Report (HIR) documents the results of Conestoga-Rovers & Associates' (CRA's) May to July 2006 hydrogeologic investigation pertaining to the Zion Station (Station). CRA prepared this HIR for Exelon as part of its Fleetwide Program to determine whether groundwater at and in the vicinity of its nuclear power generating facilities has been adversely impacted by any releases of radionuclides.

CRA collected and analyzed information on any historical releases, the structures, components, and areas of the Station that have the potential to release tritium or other radioactive liquids to the environment and past hydrogeologic investigations at the Station. CRA used this information, combined with its understanding of groundwater flow at the Station to identify the Areas for Further Evaluation (AFE) for the Station.

Fifteen new monitoring wells were installed, including 11 permanent and 4 temporary monitoring wells. CRA also collected two rounds of water levels from the newly installed wells and the surface water staff gauge. All groundwater and surface water samples were analyzed for tritium, strontium-89/90, and gamma-emitting radionuclides. Field activities were completed between May and July 2006.

The results of the hydrogeologic investigation are:

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 picoCuries per liter (pCi/L) in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Tritium was not detected within any area in or adjacent to the Station at levels above the United States Environmental Protection Agency drinking water standard of 20,000 pCi/L in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Low levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L, which is considered background;
- Tritium was detected in groundwater samples collected from monitoring well MW-ZN-01S. These concentrations ranged from less than LLD (most recently) to 586 ± 141 pCi/L (lower interval) and 220 ± 123 pCi/L to 261 ± 124 pCi/L (upper

interval). The detected concentrations are significantly less than applicable drinking water standard. The source of tritium in this location is likely attributable to historical releases in this area. However, the most recent sample results are within the range of background concentrations;

- Based on the results of this investigation, tritium is not migrating off the Station property at detectable concentrations;
- Based on the results of this investigation, there is no current risk from exposure to radionuclides associated with licensed plant operations through any of the identified potential exposure pathways; and
- Based on the results of this investigation, there are no known active releases into the groundwater at the Station.

Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has prepared this Hydrogeologic Investigation Report (HIR) for Exelon Generation Company, LLC (Exelon) as part of its fleetwide program to determine whether groundwater at and near its nuclear power generating facilities has been adversely impacted by any releases of radionuclides. This report documents the results of CRA's May 2006 Hydrogeologic Investigation Work Plan (Work Plan), as well as several other investigative tasks recommended by CRA during the course of the investigation. These investigations pertain to Exelon's Zion Station (Station) in Zion, Illinois (see Figure 1.1). The Station is defined as all property, structures, systems, and components owned and operated by Exelon LLC and located at 101 Shiloh Boulevard, Zion, Lake County, Illinois. The approximate property boundaries are depicted on Figure 1.2.

Pursuant to the Work Plan, CRA assessed groundwater quality at the Station in locations designated as areas for further evaluation (AFEs). The process by which CRA identified AFEs is discussed in Section 3.0 of this report.

The objectives of the Work Plan were to:

- characterize the geologic and hydrogeologic conditions at the Station including subsurface soil types, the presence or absence of confining layers, and the direction and rate of groundwater flow;
- characterize the groundwater/surface water interaction at the Station, including a determination of the surface water flow regime;
- evaluate groundwater quality at the Station including the vertical and horizontal extent, quantity, concentrations, and potential sources of tritium and other radionuclides in the groundwater, if any;
- define the probable sources of any radionuclides released at the Station;
- evaluate potential human, ecological, or environmental receptors of any radionuclides that might have been released to the groundwater; and
- evaluate whether interim response activities are warranted.

2.0 STATION DESCRIPTION

The following section presents a general summary of the Station location and definition, overview of Station operations, surrounding land use, and an overview of both regional and Station-specific topography, surface water features, geology, hydrogeology, and groundwater flow conditions. This section also presents an overview of groundwater use in the area.

2.1 STATION LOCATION

The Station is a former nuclear power generating facility that, in the early spring of 1998, converted both units' generators to synchronous condensers that provide voltage stability to the northeast Illinois power grid. The Station encompasses approximately 250 acres (Exelon, 2004). Figure 1.2 presents a Station Boundaries and Features plan.

The Station is located on the eastern edge of Zion between 23rd and 29th Streets, from the Chicago and Northwestern Railroad tracks to Lake Michigan.

The Station is being maintained and monitored under the "SAFSTOR" (safe storage of components of the nuclear power plant) phase of decommissioning, as is discussed below.

2.2 OVERVIEW OF COOLING WATER OPERATIONS

Former Operations

In the mid-1950s, Commonwealth Edison Company (ComEd) purchased about 250 acres on the eastern edge of Zion. The Station operated as a dual unit pressurized water reactor plant. A construction permit was issued in December 1968. An operating license was issued October 19, 1973 for Unit 1 and November 14, 1973 for Unit 2. Commercial operations commenced in December 1973 for Unit 1 and September 1974 for Unit 2.

Unit 1 operations ended on February 21, 1997 and Unit 2 operations ended on September 19, 1996. All fuel was removed from the reactor and placed in the spent fuel pool on April 27, 1997 for Unit 1 and on February 25, 1998 for Unit 2. Commercial operation of the plant ended on January 14, 1998 when the Unicom Corporation and ComEd Boards of Directors authorized the permanent cessation of operations at the Station. Exelon submitted the certification of fuel transfer on March 9, 1998. In addition

to maintaining the synchronous condensers, the Station's employees also monitor the safe storage of spent fuel.

Discharges from the Station are subject to the requirements of Nuclear Regulatory Commission (NRC) Operating Licenses DPR-39 and DPR-48. Discharges from the Station are also subject to regulation under the Illinois Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit IL0002763. The NPDES permit provides limits on parameters such as pH, total suspended solids, and oil and grease.

Cooling Water Operations 1973-1997

The Station is comprised of two nearly identical pressurized water reactors with supporting facilities. Both primary reactor coolant systems were designed by Westinghouse Corporation and each is comprised of a reactor vessel and four heat transfer loops. Each loop contains a reactor coolant pump, steam generator, and associated piping and valves. In addition, each system includes a pressurizer, a pressurizer relief tank, interconnecting piping, and the instrumentation necessary for operational control.

Each Containment Building is cylindrical with a shallow dome roof and has a flat slab foundation. The entire structure is internally lined with a welded steel plate and completely encloses the primary coolant system, steam generators, reactor coolant loops, and portions of the auxiliary and engineered safety feature systems.

Heat produced in the reactor was converted to electrical energy by the power conversion system between 1973 and 1997. A turbine generator converted the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy.

The exhaust steam from the turbine was condensed and deaerated in the main condenser. The waste heat in the main condenser was removed by the circulating water system. Circulating water was withdrawn from Lake Michigan, approximately 450 feet east of the condensate storage tank, via an intake pipe connected to the circulating water pumps. After circulating through the plant condensers, the cooling water was routed back to the lake via discharge lines (ComEd, 1999).

Primary coolant was treated to remove impurities and recirculated through the primary water (PW) system. Primary coolant was stored in two above ground storage tanks (ASTs) located on the east side of the Turbine Building.

Secondary cooling water (condensate cooling water) was treated to remove impurities and recirculated through the condensate (CD/SC) system. Secondary cooling water is stored in ASTs located on the east side of the Turbine Building.

Circulating water is drawn from Lake Michigan by way of an intake pipe that extends approximately a half mile into the Lake. Circulating water is returned to Lake Michigan by way of two discharge pipes that extend approximately a quarter mile into the lake.

Liquid wastes have been discharged under the NRC permit through the blowdown line, which is piped to the circulating water discharge pipe located east of the Turbine Building.

Voltage Stabilization and SAFSTOR

The Station is being decommissioned under the NRC regulatory process. The Station is currently in the "SAFSTOR" phase of the decommissioning process where the Station is maintained in a condition that allows it to be safely stored and subsequently decontaminated to levels that permit its release for unrestricted use.

2.3 SURROUNDING LAND USE

The Station is located on the shore of Lake Michigan, in the eastern portion of the City of Zion, and adjacent to the Illinois Beach State Park.

The Illinois Beach State Park is located along the Lake Michigan shoreline and is divided into a northern unit and a southern unit, with the Station situated between the two units. The Illinois Beach State Park encompasses 4,160 acres and received approximately 2.75 million visitors in 1998. The Park is considered a natural resource (ATSDR, 2000).

The land located to the west of the Station is generally undeveloped with a limited number of industrial/commercial facilities present along Deborah Avenue. Residential areas and the City of Zion downtown are located west of the Chicago & Northwestern Railroad, which is west of the Station. Lake Michigan borders the Station to the east.

2.4 STATION SETTING

The following sections present a summary of the topography, surface water features, geology, hydrogeology, and groundwater flow conditions in the region surrounding the Station. The information was primarily gathered from Sections 2.1 and 2.3 of the Zion Defueled Safety Analysis Report (DSAR) last revision dated October 2004 (Exelon, 2004). The main references the DSAR relies upon are listed in Section 10.0 of this HIR. CRA checked and verified all DSAR references that apply to this HIR.

2.4.1 TOPOGRAPHY AND SURFACE WATER FEATURES

Lake County consists of moraines, outwash plains, lake plains, kames, stream terraces, flood plains, beaches, and bogs. The county is in the Wheaton Morainal country of the Great Lakes section of the Central Lowland province. Relief in Lake County was caused by differences in the thickness of deposits left by the most recent glacier. The land surface gradually slopes to the south or southeast. The highest point in the county, 957 feet above mean sea level (AMSL), is located on Gander Mountain in the northwest corner of the county. The lowest point is at the Lake Michigan shore near Waukegan. Several moraines run through the county. From east to west, they are the Lake Border Morainic System, the Tinley Moraine, the Valparaiso Morainic System, and the Fox Lake Moraine. In general, Lake County has a poorly defined drainage pattern. Many drainage ways terminate in depressions and marshes. The land area falls into four major watersheds and 26 drainage basins. The Chicago River, Des Plaines River, Fox River, and Lake Michigan watersheds are all shared with neighboring counties in Illinois and Wisconsin (NRCS, 2005).

The Lake Michigan shoreline between North Chicago, Illinois and Kenosha, Wisconsin comprises the Zion beach-ridge plain. The Zion beach-ridge plain consists of linear, generally coast-parallel mounds of sand and gravel that have been built up by wave action to extend the coast outward into Lake Michigan. The Zion beach-ridge plain has a maximum width of approximately 1 mile near the City of Zion (Chrzastowski and Frankie, 2000). The older dunes become root-bound by vegetation resulting in long lines of sandy ridges separated by linear marshes.

The main portion of the Station is located on a sand ridge that runs parallel to the Lake Michigan shoreline as shown on Figure 1.2. The area in the immediate vicinity of the Station has been leveled and is paved. The ground elevation at the main complex is 591 feet AMSL. The average lake level is 577 feet AMSL. The eastern portion of the

Station is a beach gently sloping to the Lake Michigan shoreline. The area to the west of the Station is a low-lying wet area.

Lake Michigan has a surface area of 22,300 square miles, with a mean depth of 276 feet and a volume of 1,170 cubic miles. Lake Michigan has a natural outlet through the Straits of Mackinac on the north end of the lake and a second outlet through the Illinois Waterway near Chicago (USEPA, 1995).

The average surface elevation of Lake Michigan is 577 feet AMSL. The surface elevation of Lake Michigan varies daily and annually, and is affected by hydrologic and atmospheric conditions and flow through the two outlets. Water levels in Lake Michigan typically vary about 1 foot in elevation between annual low and high measurements. Generally, the lowest levels occur in winter when much of the precipitation is locked up in ice and snow on land, and dry winter air masses pass over the lakes enhancing evaporation. Levels are highest in summer after the spring thaw when runoff increases (USEPA, 1995).

The low-lying wet area on the western portion of the Station is in the watershed of the Dead River, which flows through the marshy swales located to the west of the longitudinal sand dunes that follow the Lake Michigan shoreline. The Dead River passes through the Illinois Beach State Park as shown on Figure 1.1. The Dead River flows into Lake Michigan at a point approximately 2.3 miles south of the Station. The Dead River was so named because the mouth is periodically blocked by shifting sandbars on the Lake Michigan shoreline.

Storm water runoff from the switchyard is captured by the perimeter ditch, which is a drainage channel that follows the Station's outer fence. The perimeter ditch connects to Lake Michigan to the north and south of the Protected Area (PA). Figure 2.1 presents a depiction of the perimeter ditch and the stormwater drainage ditches that control surface water at the Station. On the western portion of the Station property some of these drainage systems intercept the shallow groundwater. This is not the case on the eastern portion of the Station property where the stormwater drainage system is located above the water table as it drops towards Lake Michigan.

2.4.2 **GEOLOGY**

This section presents an overview of Station geology based upon the 1967 Foundation Investigation (Dames and Moore, 1967) and other geologic publications. The Station is underlain by overburden deposits and a regionally extensive sequence of consolidated

sedimentary deposits. The major stratigraphic features can be divided into Paleozoic aged bedrock and Quaternary Period overburden deposits. Figure 2.2 presents a stratigraphic cross-section representative of bedrock units in Lake County, Illinois. Figure 2.3 presents a cross-section of the overburden deposits associated with the Zion beach-ridge plain.

Rocks of the Cambrian through Silurian Periods are marine in origin and were deposited in a sea that covered all of Illinois (Willman, 1971). The rocks consist of sandstones, shales, and carbonates for a combined thickness of approximately 2,500 feet. Southerly long shore currents have eroded the Root River delta and transported the sediments along the western shore of Lake Michigan to form the Zion beach-ridge plain (Chrzastowski and Frankie, 2000).

2.4.3 HYDROGEOLOGY

Groundwater in the region occurs in shallow glacial, alluvial, and lacustrine deposits. The shallow water-bearing zone is isolated from the underlying regional bedrock aquifers by a significant thickness of glacial or lacustrine silts and clays.

Bedrock units form three major aquifer systems in northeastern Illinois. The uppermost bedrock aquifer consists of the Silurian dolomites. The underlying Maquoketa Group shales hydraulically separate the Silurian aquifer from deeper units.

The deeper aquifer systems include the Cambrian-Ordovician aquifer group, which includes the St. Peter and Ironton-Galesville sandstones. The underlying Eau Claire Formation hydraulically separates the Cambrian-Ordovician aquifer group from the deeper Mt. Simon Aquifer (Visocky et al., 1985).

The sandstones of the Mt. Simon Formation are not typically used for potable water because of undesirable characteristics including high concentrations of total dissolved solids and natural radioactivity. Crystalline basement rock underlies the Mt. Simon Formation (Visocky et al., 1985).

Lake Michigan acts as a major regional discharge zone for groundwater. The groundwater flow in both unconsolidated deposits and bedrock units in the region is generally toward the lake; however, localized pumping induces variations in flow directions in the bedrock aquifers.

2.5 AREA GROUNDWATER USE

A water well inventory compiled as part of this investigation indicates a number of wells located (or formerly located) near the Station. The locations of wells in the vicinity of the Station are provided on Figure 2.4. A water well report was prepared using Illinois water well databases and associated well logs, and is provided in Appendix A. The well records for locations nearest to the Station (map identifiers 5, 6, and 10) are mis-located (Map Id. 5¹), not a water well (Map Id. 6²), or no longer exist (Map Ids. 6 and 10³). With the exception of Map Ids. 6 and 10, the wells identified in the water well report have not been field verified and it is expected that many of the wells listed have been abandoned.

The City of Zion provides municipal water to the City residents and the surrounding area. The City purchases water from the Lake County Public Water District (LCPWD). The LCPWD obtains its water from Lake Michigan by means of an intake pipe located approximately 1.1 mile north of the Station and extending 3,000 feet into the Lake. The City of Zion municipal code requires all improved properties to be connected to the City's water supply. It is "unlawful for any person to construct, permit or maintain a private well or water supply system within the City which uses groundwater as a potable water supply" (City of Zion, 2004). The only exception is for existing wells constructed prior to March 2, 2004 at properties located more than 100 feet from the municipal supply system, which must: 1) enter into an agreement with the City, and 2) demonstrate that the well water is unlikely to contain any contaminant at concentrations exceeding the United States Environmental Protection Agency (USEPA) drinking water standards (City of Zion, 2004).

The Station is connected to the Zion municipal water supply and does not use groundwater in its operations. The Illinois Beach State Park is serviced by municipal water.

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- ¹ Map ID 5 is a private water well at Lot #1, Beach Homeland subdivision, Beach Park, Illinois. The latitude and longitude listed in the ISWS database is inconsistent with the address listed in the well log (Beach Park is located between Zion and Waukegan).
 - ² Map ID 6 is an engineering test hole installed by Norm Hester of the ISGS on November 1, 1972. The total depth was 15 feet. This boring was installed as part of a study documented in Fraser and Hester (1974).
 - ³ Map ID 10 is a water well installed by F H Ferguson at 'Zion Estates' at an unknown date. The total depth of the well was 138 feet. The location specified in the well record (42.446046N, 87.800889W) indicates that this well was located on the eastern edge of what is now the Zion Station. 'Zion Estates' may have been part of the Hosah Beach subdivision (see Bannon-Nilles 2003) which was purchased by ComEd in about 1967. This well is not currently present at the Zion Station.

3.0 AREAS FOR FURTHER EVALUATION

CRA considered all Station operations in assessing groundwater quality at the Station. During this process, CRA identified areas at the Station that warranted further evaluation or "AFEs". This section discusses the process by which AFEs were selected.

CRA's identification of AFEs involved the following components:

- Station inspection on March 22 to 23, 2006;
- interviews with Station personnel;
- evaluation of Station systems;
- investigation of confirmed and unconfirmed releases of radionuclides; and
- review of previous Station investigations.

CRA analyzed the information collected from these components combined with information obtained from CRA's study of hydrogeologic conditions at the Station to identify those areas where groundwater potentially could be impacted from operations at the Station.

CRA then designed an investigation to determine whether any confirmed or potential releases or any other release of radionuclides adversely affected groundwater. This entailed evaluating whether existing Station groundwater monitoring systems were sufficient to assess the groundwater quality at the AFEs. If the systems were not sufficient to adequately investigate groundwater quality associated with any AFE, additional monitoring wells were installed by CRA.

The following sections describe the above considerations and the identification of AFEs. The results of CRA's investigation are discussed in Section 5.0.

3.1 SYSTEMS EVALUATIONS

Exelon launched an initiative to systematically assess the structures, systems and components that store, use, or convey potentially radioactively contaminated liquids. Maps depicting each of these systems were developed and provided to CRA for review. The locations of these systems are presented on Figure 3.1. The Station identified a total of 17 systems that contain or could contain potentially radioactively contaminated liquids. The following presents a list of these systems.

<i>System Identification</i>	<i>Description</i>
AD	Auxiliary Drains
AX	Auxiliary Steam
BD	Blowdown System
CF	Cavity Fill
CW	Circulating Water
VC	Chemical and Volume Control
CC	Component Cooling
CD/SC	Condensate and Condensate Storage
MS	Main Steam
PW	Primary Water
RR	Resin Removal
SI	Safety Injection
SW	Service Water
SF	Spent Fuel
TD	Turbine Building Drains
WD	Waste Disposal
WT	Waste Water

After these systems were identified, Exelon developed a list of the various structures, components and areas of the systems (e.g., piping, tanks, and process equipment) that handle or could potentially handle any radioactively contaminated liquids. The structures, components, and areas may include:

- aboveground storage tanks;
- condensate vents;
- areas where confirmed or potential historical releases, spills, or accidental discharges may have occurred;
- pipes;
- pools;
- sumps;
- surface water bodies (i.e., basins, pits, ponds, or lagoons);
- trenches;
- underground storage tanks; and
- vaults.

The Station then individually evaluated the various system components to determine the potential for any release of radioactively contaminated liquid to enter the environment. Each structure or identified component was evaluated against the following seven primary criteria:

- location of the component (i.e., basement or second floor of building);
- component construction material (i.e., stainless steel or steel tanks);
- construction methodologies (i.e., welded or mechanical pipe joints);
- concentration of radioactively contaminated liquid stored or conveyed;
- amount of radioactively contaminated liquid stored or conveyed;
- existing controls (i.e., containment and detection); and
- maintenance history.

System components, which were located inside a building or that otherwise had some form of secondary containment, such that a release of radioactively contaminated liquid would not be discharged directly to the environment, were eliminated from further evaluation. System components that are not located within buildings or did not have some other form of secondary containment were retained for further qualitative evaluation of the risk of a release of radioactively contaminated liquid to the environment and the potential magnitude of any release.

Exelon's risk evaluation took into consideration factors such as:

- the potential concentration of radionuclides;
- the volume of liquid stored or managed;
- the probabilities of the systems actually containing radioactively contaminated liquid; and
- the potential for a release of radioactively contaminated liquid from the system component.

These factors were then used to rank the systems and system components according to the risk for a potential release of a radioactively contaminated liquid to the environment. The evaluation process resulted in the identification of structures, components, and areas to be considered for further evaluation.

3.2 HISTORICAL RELEASES

CRA also reviewed information concerning confirmed or potential historical releases of radionuclides at the Station, including reports and documents previously prepared by Exelon and compiled for CRA's review. CRA evaluated this information in identifying the AFEs. Any historical releases identified during the course of this assessment that may have a current impact on Station conditions are further discussed in Section 3.4.

3.3 STATION INVESTIGATIONS

CRA considered previous Station investigations in the process of selecting the AFEs for the Station. This section presents a summary of the pre-operational radiological environmental monitoring program (pre-operational REMP), past station investigations, and the radiological environmental monitoring program (REMP).

3.3.1 PRE-OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A pre-operational REMP was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were surface water, well water, air particulates, milk, locally grown vegetables, and aquatic plants and animals (ComEd, 1971). The results of the monitoring were detailed in the report entitled, 1971 Zion Station Final Safety Analysis Report, December 1971.

The pre-operational REMP report noted that surface water was sampled at five public water intakes. Generally, the gross beta radioactivity of Lake Michigan was less than 10 picoCuries per liter (pCi/L) with typical concentrations between 3 pCi/L to 6 pCi/L. Gross alpha radioactivity was typically less than 3 pCi/L (ComEd, 1971).

Tritium levels in Lake Michigan water were studied in the vicinity of Zion Station throughout 1970. The concentration of tritium in the surface water samples from the Lake at Zion ranged from approximately 311 ± 20 pCi/L to 374 ± 34 pCi/L and averaged 340 pCi/L. There was no statistical difference in average tritium concentrations among the stations (eight stations from Kenosha to Waukegan) (ComEd, 1971).

1973 Aerial Radiological Measuring System

An Aerial Radiological Measuring System (ARMS) survey was conducted at the Station prior to the startup of the reactors in 1973. The ARMS survey was conducted using small aircraft flying at an altitude between 300 and 500 feet. Ground-based measurements were obtained from two locations as part of the study. Tritium measurements were not included in the ARMS survey (ComEd, 1999).

The ARMS survey showed that cosmic ray exposure rate was substantially less than the northern Illinois background radiation level (ComEd, 1999).

Soil samples contained small concentrations of uranium-238 and thorium-232. Cesium-137 activity in soil samples ranged from 0.276 to 0.40 picoCuries per gram (pCi/g) (ComEd, 1999).

3.3.2 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The REMP at the Station was initiated in 1973. The REMP includes the collection of multi-media samples including air, surface water, groundwater, fish, sediment, and vegetation. The samples are analyzed for beta and gamma-emitting radionuclides, tritium, iodine-131, and/or strontium as established in the procedures developed for the REMP. The samples are collected at established locations, identified as stations, so that trends in the data can be monitored.

An annual report is prepared providing a description of the activities performed and the results of the analysis of the samples collected from the various media. The latest report generated was prepared by Station personnel and is entitled Final Monthly Progress Report to Exelon Nuclear, Radiological Environmental Monitoring Program - 2005. This report concluded that the operation of the Station had no adverse radiological impact on the environment. The annual report is submitted to the NRC.

Prior to the cessation of power generation in 1998, surface water samples were collected at the following six locations along Lake Michigan:

- Kenosha, Wisconsin (intake located 10 miles north of the Station);
- Lake County Public Water District (intake located 1.1 miles north of the Station);
- Waukegan, Illinois (intake located 6 miles south of the Station);
- North Chicago, Illinois (intake located 10 miles south of the Station);

- Great Lakes NTS (intake located 13 miles south of the Station); and
- Lake Forest, Illinois (intake located 16.5 miles south of the Station).

After 1998, surface water samples were collected at the following four locations along Lake Michigan:

- Kenosha, Wisconsin (intake located 10 miles north of the Station);
- Lake County Public Water District (intake located 1.1 miles north of the Station);
- Waukegan, Illinois (intake located 6 miles south of the Station); and
- Lake Forest, Illinois (intake located 16.5 miles south of the Station).

Lake Michigan surface water data are collected as part of the REMP. Tritium concentrations in surface water samples from Lake Michigan ranged from non-detect to 660 pCi/L.

3.3.3 DEFUELED SAFETY ANALYSIS REPORT

In October 2004, Exelon updated the Defueled Safety Analysis Report (DSAR). The DSAR discusses the overall adequacy of the Station for safety, storing, and handling of fuel and radioactive waste, and to monitor potential radiological effluent release paths. It provides information on Station and local characteristics such as geography, demography, meteorology, geology, and hydrogeology.

The DSAR states that intermittent liquid effluents from the Station will not affect groundwater supplies in the adjacent area in excess of concentrations in 10 CFR 20 due to local drainage patterns, release rates, and specific features of the sources of water supplies.

The DSAR also states that the Station's radioactive liquid waste generated is collected, treated and either recycled or discharged. Discharged liquid wastes are monitored to assure compliance with 10 CFR 20. Radioactivity levels should not exceed permissible concentrations at the cooling water outlet in Lake Michigan. The two closest municipal water intakes are the LCPWD (approximately 1 mile north) and the Waukegan Waterworks (approximately 6 miles south). The February 2005 REMP report indicates that there have been no tritium concentrations detected in surface water samples at concentrations exceeding the lower limit of detection (LLD) of 200 pCi/L.

3.3.4 WISCONSIN DEPARTMENT OF HEALTH AND FAMILY SERVICES MONITORING

The Wisconsin Public Health Statutes 254.41 mandates the Department of Health and Family Services (DHFS) to conduct environmental radiation monitoring around the nuclear power facilities that impact Wisconsin. The Station is included in this monitoring due to its proximity to the Wisconsin border. In the 2004 Zion Environmental Radioactivity Survey, the Wisconsin DHFS concluded:

- air particulate analysis shows no evidence of influence by the Station on air quality;
- the average yearly exposure of ambient gamma radiation is at background levels and is comparable to other areas within Wisconsin;
- the surface water samples showed no unusual concentrations of gross beta, gross gamma, tritium, and strontium;
- the gamma isotopic analysis for surface water indicated radioisotopes below their respective minimum detectable concentration;
- the gamma isotopic analysis on vegetation detected only a small amount of the naturally occurring elements potassium-40 and beryllium-7;
- the gamma isotopic analysis for soil detected potassium-40 and cesium-137. These were also detected in previous years and are naturally occurring (potassium-40) or attributable to fallout from previous atmospheric nuclear tests (cesium-137); and
- doses of radiation as a result of gaseous and liquid effluent are less than the limits allowed for an average individual as stated in Federal Regulations.

3.4 IDENTIFIED AREAS FOR FURTHER EVALUATION

CRA used the information presented in the above sections along with its understanding of the hydrogeology at the Station to identify AFEs, which were a primary consideration in the development of the scope of work in the Work Plan. The establishment of AFEs is a standard planning practice in hydrogeologic investigations to focus the investigation activities at areas where there is the greatest potential for impact to groundwater.

Specifically, AFEs were identified based on these six considerations:

- systems evaluations;
- risk evaluations;
- review of confirmed and/or potential releases;

- review of documents;
- review of the hydrogeologic conditions; and
- Station inspection completed on March 22 and 23, 2006.

Prior to CRA completing its analysis and determination of AFEs, Station personnel completed an exhaustive review of all historic and current management of systems that may contain potentially radioactively contaminated liquids.

CRA reviewed the systems identified by the Station, which have the potential for the release of radioactively contaminated liquids to the environment, and groundwater flow at the Station. This evaluation allowed CRA to become familiar with Station operations and potential systems that may impact groundwater. CRA then evaluated information concerning historic releases as provided by the Station. This information, along with a review of the results from historic site investigations, was used to refine CRA's understanding of areas likely to have the highest possibility of impacting groundwater. Where at risk systems or identified historical releases were located in close proximity or were located in areas which could not be evaluated separately, the systems and historical releases were combined into a single AFE. At times, during the Station investigation, separate AFEs were combined into one or were otherwise altered based on additional information and consideration. This HIR details the AFEs investigated.

Finally, CRA used its understanding of known hydrogeologic conditions (prior to this investigation) to identify AFEs. Groundwater flow was an important factor in deciding whether to combine systems or historical releases into a single AFE or create separate AFEs. For example, groundwater beneath several systems that contain radioactively contaminated liquids that flows toward a common discharge point were likely combined into a single AFE. The AFEs were created based on known groundwater flow conditions prior to the work completed during this investigation.

Based upon its review of information concerning confirmed or potential historical releases, historic investigations, and the systems at the Station that have the potential for release of radioactively contaminated liquids to the environment combined with its understanding of groundwater flow at the Station, CRA has identified four AFEs (see Figure 3.1).

AFE-Zion-1: Main Complex Area

This area was identified to evaluate the main area of the facility, which includes the two containment structures, the Fuel Building that contains spent fuel, the Auxiliary Building, and the Turbine Building.

AFE-Zion-2: Unit 1 (Southern) Aboveground Storage Tank (AST) Area

This area was identified to evaluate the quality of groundwater in the area around the Unit 1 systems including the primary water storage tank, the secondary condensate tank, oil separator, discharge tunnel, and discharge outfall. This AFE was established based on information regarding the storage, handling, and historical releases in this area.

AFE-Zion-3: Unit 2 (Northern) AST Area

This area was identified to evaluate the quality of groundwater in the area around the Unit 2 systems including the primary water storage tank, secondary condensate tank, oil separator, discharge tunnel, and discharge outfall. This AFE was established based on information regarding the storage, handling, and historical releases in this area.

AFE-Zion-4: Wastewater Treatment Plant Area

This area comprises the Wastewater Treatment Plant in the northeast corner of the Station. Groundwater monitoring was initiated in this area of the Station to evaluate the wastewater treatment and associated systems.

4.0 FIELD METHODS

The field investigations completed for this HIR were completed in May to July 2006. CRA supervised the installation of monitoring wells and a staff gauge, and collected samples from the newly-installed monitoring wells and the surface water location. The field investigations were completed in accordance with the methodologies presented in the Work Plan (CRA, 2006).

The scope of work presented in the Work Plan included the installation and sampling of nine permanent monitoring wells and the collection of a surface water sample. Based on the concentrations of tritium detected in monitoring well MW-ZN-01S, additional investigative activities were recommended by CRA, and implemented in June and July 2006. The additional investigative tasks included a second round of sampling at MW-ZN-01S and the installation and sampling of two permanent and four temporary monitoring wells. The additional investigative activities provided plume delineation and additional hydraulic information cross-gradient and down-gradient of MW-ZN-01S. The groundwater sampling events undertaken as part of the investigation are:

- May 24-26, 2006 sampling of MW-ZN-01S through MW-ZN-09S;
- June 28, 2006 sampling of MW-ZN-01S (second round);
- July 17, 2006 sampling of TW-ZN-100 through TW-ZN-103; and
- July 28, 2006 sampling of MW-ZN-10S and MW-ZN-11S.

4.1 STAFF GAUGE INSTALLATION

Figure 4.1 presents the location of the staff gauge installed as part of this investigation. CRA installed staff gauge SG-ZN-01, which is a notch in a bridge within the Intake Crib. The Intake Crib is hydraulically connected to Lake Michigan via the intake tunnel that extends approximately 1/2 mile into Lake Michigan.

4.2 GROUNDWATER MONITORING WELL INSTALLATION

Prior to completing any ground penetration activities, CRA completed subsurface utility clearance procedures to minimize the potential of injury to workers and/or damage to subsurface utility structures. The subsurface clearance procedures consisted of completing an electronic survey within a minimum of 10-foot radius of the proposed location utilizing electromagnetic and ground penetrating radar technology.

Additionally, a vacuum soft dig was used to verify utilities were not present at the proposed location to a depth to 10 feet bgs.

Fifteen new monitoring wells were installed for the fleetwide hydrogeologic investigation, including 11 permanent and 4 temporary monitoring wells. Monitoring well construction logs are provided in Appendix B. Figure 4.1 presents the location of the 15 new monitoring wells. These locations were selected based on a review of all data provided, the hydrogeology at the Station, and current understanding of identified AFEs, and modified based on conditions encountered during the investigation. Table 4.1 summarizes the well installation details.

Specific installation protocols for the permanent monitoring wells are described below:

- the borehole was advanced to the target depth using 4.25-inch inside diameter hollow-stem augers (HSA);
- a nominal 2-inch diameter (No. 10 slot) PVC screen, 10 or 20 feet in length, attached to a sufficient length of 2-inch diameter schedule 40 PVC riser pipe to extend to the surface, was placed into the borehole through the augers;
- a filter sand pack consisting of silica sand was installed to a minimum height of 2 feet above the top of the screen as the augers were removed;
- a minimum 2-foot thick seal consisting of 3/8-inch diameter bentonite pellets or chips was placed on top of the sand pack and hydrated using potable water;
- the remaining borehole annulus was sealed to within 3 feet of the surface using pure bentonite chips (the soft-dig portion of the borehole was backfilled with a mixture of soil and bentonite); and
- the remaining portion of the annulus was filled with concrete and a 6-inch diameter protective above-grade casing. The well head was fitted with a water-tight lockable cap.

Specific installation protocols for the temporary monitoring wells are described below:

- the borehole was advanced to the target depth using a 2-inch direct push technology (DPT) drill rig;
- a nominal 1-inch diameter (No. 10 slot) PVC screen, 15 or 20 feet in length, attached to a sufficient length of 1-inch diameter schedule 40 PVC riser pipe to extend to the surface, was placed into the borehole through the DPT casing;
- a filter sand pack consisting of silica sand was installed to a minimum height of 2 feet above the top of the screen as the augers were removed;

- a minimum 2-foot thick seal consisting of bentonite powder was placed on top of the sand pack; and
- the remaining borehole annulus was sealed at the surface using bentonite powder or chips.

The shallow soil borings completed in unconsolidated materials that were to be used for monitoring well installation were installed using either DPT or 4.25-inch inside diameter HSA drilling techniques. The borehole depths ranged from 19 to 45 feet bgs. During the subsurface utility clearance activities described above, the borehole was periodically examined and the soil types documented. A description was added to each monitoring well construction log. The overburden soils were classified using the Unified Soil Classification System (USCS).

4.3 GROUNDWATER MONITORING WELL DEVELOPMENT

To establish good hydraulic communication with the aquifer and reduce the volume of sediment in the permanent monitoring wells, well development was conducted in accordance with the procedure outlined below:

- monitoring wells were surged using a pre-cleaned bailer for a period of at least 5 minutes;
- a minimum of one well volume of water was purged using a submersible pump;
- the monitoring well was surged for 5 minutes again;
- water was purged from the monitoring well using an electric submersible pump;
- groundwater was collected at regular intervals and the pH, temperature, and conductivity were measured using field instruments. These instruments were calibrated daily according to the manufacturer's specifications. Additionally, observations such as color, odor, and turbidity of the purged water were recorded; and
- development continued until the turbidity and silt content of the monitoring wells were significantly reduced and three consistent readings of pH, temperature, and conductivity were recorded, or a minimum of ten well volumes was purged.

A summary of the monitoring well development parameter measurements is presented in Table 4.2.

4.4 SURVEY

The 15 monitoring wells and surface water gauge were surveyed to establish reference elevations relative to mean sea level. The top of each well casing was surveyed to the nearest 0.01 foot relative to the National Geodetic Vertical Datum (NGVD), and the survey point was marked on the well casing. The survey included the ground elevation at each well to the nearest 0.10 foot relative to the NGVD, and the horizontal well location to the nearest 1.0 foot. A reference point was also marked on the concrete at the surface water elevation measuring location.

The Lake Michigan shoreline was surveyed at the Station using a handheld Global Positioning System (GPS) with an estimated accuracy of ± 12 feet. The GPS survey was conducted on June 30, 2006.

4.5 GROUNDWATER AND SURFACE WATER ELEVATION MEASUREMENTS

On May 23, 2006 and July 27, 2006, CRA collected water level measurements from the monitoring wells and the staff gauge at the Station in accordance with the Work Plan. Based on the measured depth to water from the reference point and the surveyed elevation of the reference point, the groundwater or surface water elevation was calculated. A summary of groundwater and surface water elevations is provided in Table 4.3.

Prior to the water level measurements, the wells and staff gauges were identified and located. Once the wells were identified, CRA completed a thorough inspection of each well and noted any deficiencies. Water level measurements were collected using an electronic depth-to-water probe accurate to ± 0.01 foot. The measurements were made from the designated location on the inner riser or steel casing of each monitoring well and reference point on the staff gauge. The water level measurements were obtained using the following procedures:

- the proper elevation of the meter was checked by inserting the tip into water and noting if the contact was registering correctly;
- the tip was dried, and then slowly lowered into the well or surface water body until contact with the water was indicated;
- the tip was slowly raised until the light and/or buzzer just began to activate. This indicated the static water level;

- the reading at the reference point was noted to the nearest hundredth of a foot;
- the reading was then re-checked; and
- the water level was then recorded, and the water level meter decontaminated prior to use at the next location.

Surface water measurements for Lake Michigan were obtained from the National Oceanic and Atmospheric Administration (NOAA) gauging stations at Milwaukee, Wisconsin (Station 9087057), and Calumet Harbor, Illinois (Station 9087044) for the date and time when the water levels in monitoring wells were measured (NOAA, 2006).

<i>Station</i>	<i>Time Period</i>	<i>Median Lake Elevation</i>
9087057 Milwaukee	May 23, 2006 8:00-13:00	577.99
9087044 Calumet Harbor	May 23, 2006 8:00-13:00	577.94
May 23, 2006 8:00-13:00 Average		577.97
9087057 Milwaukee	July 27, 2006 9:15-11:10	577.91
9087044 Calumet Harbor	July 27, 2006 9:15-11:10	577.96
July 27, 2006 9:15-11:10 Average		577.93

4.6 GROUNDWATER AND SURFACE WATER SAMPLE COLLECTION

CRA conducted one round of groundwater sampling during the hydrogeologic investigation, with additional samples collected from monitoring well MW-ZN-01S. A total of 15 monitoring wells were sampled between May 24, 2006 and July 28, 2006. Eleven new permanent monitoring wells were installed. The sampling was scheduled to allow for 2 weeks to elapse between well development and groundwater sample collection. Four temporary monitoring wells were installed and sampled in July 2006.

At the monitoring well locations, CRA conducted the sampling using peristaltic pumps and dedicated polyethylene tubing to employ low flow purging techniques, as described in Puls and Barcelona (1996).

For permanent monitoring wells with 20-foot screen lengths (MW-ZN-01S through MW-ZN-08S, MW-ZN-10S and MW-ZN-11S), separate samples were collected from the lower portion and the upper portion of the screened interval. The lower sampling interval targets potential releases from deep structural features such as the basement of the Auxiliary Building. The upper sampling interval targets potential surface and near surface releases such as spills from the primary cooling water ASTs.

The groundwater in the monitoring wells was sampled by the following low-flow procedures:

- the wells were located and the well identification numbers were verified;
- a water level measurement was taken;
- the well was sounded by carefully lowering the water level tape to the bottom of the well (so as to minimize penetration and disturbance of the well bottom sediment), and comparing the sounded depth to the installed depth to assess the presence of any excess sediment or drill cuttings;
- the pump or tubing was lowered slowly into the well and fixed into place such that the intake was located at the mid-point of the well screen, or a minimum of 2 feet above the well bottom/sediment level;
- the purging was conducted using a pumping rate between 100 to 500 milliliters per minute. Initial purging began using the lower end of this range. The groundwater level was monitored to ensure that a drawdown of less than 0.3 foot occurred. If this criterion was met, the pumping rate was increased dependent on the behavior of the well. During purging, the pumping rate and groundwater level were measured and recorded approximately every 10 minutes;
- the field parameters [pH, temperature, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity] were monitored during the purging to evaluate the stabilization of the purged groundwater. Stabilization was considered to be achieved when three consecutive readings for each parameter, taken at 5-minute intervals, were within the following limits:

pH	± 0.1 pH units of the average value of the three readings,
Temperature	± 3 percent of the average value of the three readings,
Conductivity	± 0.005 milliSiemen per centimeter (mS/cm) of the average value of the three readings for conductivity <1 mS/cm and ± 0.01 mS/cm of the average value of the three readings for conductivity >1 mS/cm,
ORP	± 10 millivolts (mV) of the average value of the three readings,
DO	± 10 percent of the average value of the three readings, and
Turbidity	± 10 percent of the average value of the three readings, or a final value of less than 5 nephelometric turbidity units (NTUs);
- once purging was complete, the groundwater samples were collected directly from the pump/tubing directly into the sample containers; and

- in the event that the groundwater recharge to the monitoring well was insufficient to conduct the low-flow procedure, the well was pumped dry and allowed to sufficiently recharge prior to sampling.

All groundwater samples were labeled with a unique sample number, the date and time, the parameters to be analyzed, the job number, and the sampler's initials. The samples were then screened by the Station for shipment to Teledyne Brown Engineering Inc. (Teledyne Brown).

A sample key is presented in Table 4.4; field measurements for the hydrogeologic investigation are presented in Table 4.5.

CRA containerized the water purged from the monitoring wells during the sampling, as well as the water purged from all of the wells during the hydrogeologic investigation. The water was placed into 55-gallon drums, which will be processed by the Station in accordance with its NPDES permit.

One surface water sample was collected on May 26, 2006 from Lake Michigan at station SW-ZN-1, adjacent to the Station. The surface water sampling location is presented on Figure 4.1.

The surface water sample was collected by directly filling the sample container from the composite sampler at the determined location until completely filled. A sample key is presented in Table 4.4.

4.7 DATA QUALITY OBJECTIVES

CRA has validated the analytical data to establish the accuracy and completeness of the data reported. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. Analytical data for groundwater and surface water samples collected in accordance with the Work Plan are presented in Appendix D. Data validation reports are presented in Appendix E. The data validation included the following information and evaluations:

- sample preservation;
- sample holding times;
- laboratory method blanks;
- laboratory control samples;

- laboratory duplicates;
- verification of laboratory qualifiers; and
- field quality control (field blanks and duplicates).

Following the completion of field activities, CRA compiled and reviewed the geologic, hydrogeologic, and analytical data.

The data were reviewed using the following techniques:

- data tables and databox figures;
- hydrogeologic cross-sections; and
- hydraulic analyses.

4.8 SAMPLE IDENTIFICATION

Systematic sample identification codes were used to uniquely identify all samples. The identification code format used in the field was: WG - Zion - MW-8L - 052406 - MS - 001. A summary of sample identification numbers is presented in Table 4.4.

WG	-	Sample matrix -groundwater
WS	-	Sample matrix - surface water
Zion	-	Station code
ZN	-	Station code
MW-8L	-	Well location
052406	-	Date
MS	-	Sampler initial
001	-	Sample number

4.9 CHAIN-OF-CUSTODY RECORD

The samples were delivered to Station personnel under chain-of-custody protocol. Subsequently, the Station shipped the samples under chain-of-custody protocol to Teledyne Brown for analyses.

4.10 QUALITY CONTROL SAMPLES

Quality control samples were collected to evaluate the sampling and analysis process.

Field Duplicates

Field duplicates were collected to verify the accuracy of the analytical laboratory by providing two samples collected at the same location and then comparing the analytical results for consistency. Field duplicate samples were collected at a frequency of one duplicate for every ten samples collected. A total of three duplicate samples were collected. The locations of duplicate samples were selected in the field during the performance of sample collection activities. The duplicate samples were collected simultaneously with the actual sample and were analyzed for the same parameters as the actual samples.

Split Samples

Split samples from permanent monitoring wells and surface water were collected for the NRC for tritium simultaneously with the actual sample at every sample location. Split samples were delivered to the Station personnel and (if requested) made available to the NRC. Split samples from the temporary monitoring wells were collected directly by the NRC and the Illinois Emergency Management Agency (IEMA).

4.11 ANALYSES

Groundwater and surface water samples were analyzed for tritium and gamma-emitting radionuclides as listed in NUREG-1301, and strontium-89/90 as listed 40 CFR 141.25.

5.0 RESULTS SUMMARY

This section provides a summary of Station-specific geology and hydrogeology, along with a discussion of hydraulic gradients, groundwater elevations, and flow directions in the vicinity of the Station. This section also presents and evaluates the analytical results obtained from activities performed in accordance with the Work Plan.

5.1 STATION GEOLOGY

Geologic cross-sections in both a south-north and east-west profile have been developed. Figure 5.1 displays the cross-section locations across the Station and the cross-sections are provided on Figures 5.2 and 5.3. These cross-section locations were chosen because of their close proximity to the AFEs and structures potentially influencing groundwater flow patterns.

The Station is underlain by overburden deposits and a regionally extensive sequence of consolidated sedimentary deposits as discussed in Section 2.4.3. In descending order, the following overburden stratigraphic units have been identified and characterized during the various Station investigations:

- Upper Sand Unit: Dense to very dense granular soils which range in gradation from very fine sand to fine to coarse sand, and which contains some gravel and occasional cobbles and boulders. Depth ranges from the ground surface to an elevation of approximately 555 feet AMSL.
- Silt-Clay Unit: Hard silt, silty clay, clayey silt, and sandy silt, which contain some sand and gravel and occasional cobbles and boulders. Depth ranges from approximately 525 feet to 555 feet AMSL.
- Lower Sand Unit: Dense to very dense sands and silty sands which contain some gravel, occasional cobbles and boulders, and layers of hard silty clay, clayey silt, and sandy silt. Depth ranges from approximately 480 feet to 525 feet AMSL (ComEd, 1969).

The Upper Sand Unit includes the surficial deposits of the Zion beach-ridge plain and consists of sand and gravel of the Lake Michigan Formation. The Lake Michigan Formation describes Holocene shallow-water, near-shore beach sediments predominantly consisting of medium-grained sand with local lenses of sandy gravel, and containing beds of silt.

The Silt-Clay Unit is consistent with quiet water lacustrine deposits and may be associated with post-glacial Lake Michigan (Nipissing Phase).

The Lower Sand Unit is consistent with recurring sequences of beach and quiet water lacustrine deposits and may be associated with the extreme Lake level fluctuations. As Lake levels rose, beach deposits moved westward with the shoreline and were followed by quiet water silt and clay deposits (a transgressive sequence). As Lake levels fell, the beach moved eastward with the shoreline (a regressive sequence).

The overburden sediments are underlain by Silurian carbonate bedrock of the Niagaran Series, which was encountered at depths ranging from 102 to 116 feet bgs (ComEd, 1969). In northeastern Illinois the Niagaran Series includes the Racine, Sugar Run, and Joliet Formations (Willman et al., 1975). Below the Silurian carbonates lie Pre-Cambrian through Ordovician sedimentary rocks, including shales, carbonates, and sandstone. Crystalline basement rock is located at a depth of approximately 2,500 feet. The sedimentary bedrock strata are generally horizontal with a gentle dip to the east (Visocky et al., 1985).

Some of the Station structures are constructed to depths of approximately 60 feet bgs. Excavations were completed from grade, through the Upper Sand Unit and into the topmost portion of the Silt-Clay Unit. Excavated sands were stockpiled during the construction and used as backfill (Exelon, 2004), and are considered to be hydraulically similar to the Upper Sand Unit.

The fifteen new monitoring wells (MW-ZN-01S, MW-ZN-02S, MW-ZN-03S, MW-ZN-04S, MW-ZN-05S, MW-ZN-06S, MW-ZN-07S, MW-ZN-08S, MW-ZN-09S, MW-ZN-10S, MW-ZN-11S, TW-ZN-100, TW-ZN-101, TW-ZN-102, and TW-ZN-103) were installed within the Upper Sand Unit or fill, which consists of a primarily fine-grained sand that overlies the Silt-Clay Unit. The monitoring well logs wells are presented in Appendix B.

Cross-Section A-A' (Figure 5.2) is a north-south profile through the east side of the Station. It begins at monitoring well MW-ZN-08S and terminates at MW-ZN-05S. This cross-section transects AFE-Zion-2, AFE-Zion-3, and AFE-Zion-4. This cross-section also shows the relationship between the groundwater and the geology, excavated areas, and reactor containment and building foundations.

Cross-Section B-B' (Figure 5.3) is a west-east profile that runs from monitoring well MW-ZN-07 through the Station to Lake Michigan and intersects AFE-Zion-1 and

AFE-Zion-3. This cross-section shows the relationship between the groundwater and geology, and building foundations.

5.2 STATION HYDROGEOLOGY

This section presents the Station hydrogeology, including groundwater flow direction, man-made influences on groundwater flow, vertical hydraulic gradients, and lateral groundwater flow and velocity.

5.2.1 GROUNDWATER FLOW DIRECTIONS

The shallow groundwater flows to the east toward Lake Michigan. The building foundations restrict the groundwater flow, which causes the groundwater to flow around the Station. As mentioned previously, the shallow water table intercepts the stormwater drainage ditches in the west area of the Station property, but does appear to affect the flow of groundwater to the east and toward Lake Michigan. Groundwater flow directions for May 2006 are provided on Figure 5.4, flow directions for July 2006 are provided on Figure 5.5. Both figures present groundwater flow in the shallow groundwater system. The sheet pile wall limits the flow of groundwater towards Lake Michigan. Groundwater between the sheet pile wall and the Turbine Building flows to the north or south around the wall. Although groundwater flow circumscribes the sheet pile wall, a small component of leakage through the wall is expected.

The sheet pile wall is constructed of MZ-27 steel sheet piling. MZ-27 sheet piling is comprised of z-shaped sheet steel sections which are 18-inches wide with a 12-inch offset. The sections are 45 feet long, 3/8-inch thick, and weigh 27 pounds per square foot of wall.

5.2.2 MAN-MADE INFLUENCES ON GROUNDWATER FLOW

The building foundations of the main complex extend through the Upper Sand Unit and into the top of the underlying silts and clays. Deep structures include the Reactor Containment Buildings, the Fuel Storage Building, the Auxiliary Building, the Turbine Building, and the crib area. The deep building foundations act as hydraulic barriers for shallow groundwater as is discussed below.

During the construction of the Station, a sheet pile wall was installed along the Lake Michigan shoreline to prevent lake water from entering the excavation. The sheet pile wall was modified over the course of the construction and currently extends to a depth of approximately 45 feet bgs. The top of the sheet pile wall is lined with boulders and forms a breakwall, which is shown on Figure 5.3.

Shallow groundwater will flow into the stormwater drainage ditches located on the west portion of the Station property. However, the groundwater in this area is upgradient of the PA and areas within the Station that potentially contain tritiated water. As such the groundwater discharge to these stormwater systems is not expected to be impacted by tritium.

5.2.3 VERTICAL HYDRAULIC GRADIENTS

The Upper Sand Unit is a high permeability unit that is directly connected to Lake Michigan, which is a regional discharge feature, and which generally allows unrestricted lateral groundwater flow. Vertical groundwater flow is limited by the underlying Silt-Clay Unit, which has a low permeability and is approximately 30 feet thick. To the extent that vertical flow can occur, the vertical gradient is expected to be upward based on the artesian pressure observed in the Lower Sand Unit during the 1967 Foundation Investigation (Dames and Moore, 1967).

5.2.4 LATERAL GROUNDWATER FLOW AND VELOCITY

Fifteen monitoring wells were installed at the Station as part of the 2006 hydrogeologic investigation. Shallow groundwater is present at a depth less than 12 feet bgs in the Upper Sand Unit. The shallow water-bearing zone is isolated from the underlying regional bedrock aquifers by the underlying Silt-Clay Unit. The Silt-Clay Unit is approximately 30 feet thick and extends approximately 15 feet below the deepest structural feature at the Station.

Shallow groundwater flows is generally towards Lake Michigan. A potentiometric surface contour map is provided on Figure 5.4 (May 2006) and Figure 5.5 (July 2006). The hydraulic gradient ranges from 0.001 feet per foot near the switchyard (west of the Station) to 0.008 feet per foot near the eastern portion of the Station. The hydraulic conductivity of the surficial sands is expected to be approximately 12 feet per day based on the median measurement from a study conducted along the Illinois-Indiana border of the shallow aquifer along Lake Michigan (USGS, 1996). The velocity of the shallow

groundwater may be roughly approximated using the Station-specific hydraulic gradient with the literature value for hydraulic conductivity and a typical value for porosity. Using the hydraulic gradient range of 0.001 to 0.008 feet per foot with a hydraulic conductivity of 12 feet per day and an assumed porosity of 0.32 yields a velocity range of 14 to 110 feet per year (USEPA, 1996).

5.3 GROUNDWATER QUALITY

CRA personnel collected groundwater samples from fifteen wells. The samples were analyzed for tritium and additional radionuclides. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. The analytical data reports are provided in Appendix D.

The analytical data presented herein have been subjected to CRA's data validation process. CRA has used the data with appropriate qualifiers where necessary.

The data reported in the figures and tables do not include the results of recounts that the laboratory completed, except if those results ultimately replaced an initial report. The tables and figures, therefore, include only the first analysis reported by the laboratory. Where multiple samples were collected over time, then the most recent result has been used in the discussion, below.

Two samples were collected from two different elevations in each permanent monitoring well except for monitoring well MW-ZN-09S. The samples were collected at 16 feet above the well bottom for the upper sample and 3 feet above the well bottom for the lower sample. At monitoring well MW-ZN-09S there was not a sufficient depth of water for both samples to be collected and a single sample at MW-ZN-09S was collected at 3 feet above the well bottom, which is the equivalent of an upper sample in the other monitoring wells.

5.3.1 SUMMARY OF BETA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

A summary of the tritium results for the groundwater samples collected during this investigation is provided in Table 5.1 and shown on Figure 5.6.

Groundwater samples were collected from the upper and lower portions of the screen in each monitoring well with a 20-foot screen (MW-ZN-01S through MW-ZN-11S with the

exception of MW-ZN-09S). Groundwater samples were also collected from Temporary Wells (TW-ZN-100 through TW-ZN-103). All tritium concentrations were below the USEPA drinking water standard of 20,000 pCi/L. Tritium was not detected greater than the LLD of 200 pCi/L in samples collected from 14 of the 15 monitoring wells. Concentrations of tritium exceeding the LLD of 200 pCi/L were only detected in groundwater samples collected from monitoring well MW-ZN-01S. The concentrations of tritium detected in the initial round of sampling were 586 ± 141 pCi/L in the lower portion of the screen and 261 ± 124 pCi/L in the upper portion of the screen. MW-ZN-01S was re-sampled on June 28, 2006 and the concentrations of tritium were less than the LLD of 200 pCi/L in the lower portion of the screen and 220 pCi/L in the upper portion of the screen.

Strontium-89/90 was not detected at concentrations exceeding the LLD of 2.0 pCi/L. A summary of the strontium-89/90 results for the groundwater samples collected as part of the investigation that is the subject of this HIR is provided in Table 5.2 and shown on Figure 5.7.

5.3.2 SUMMARY OF GAMMA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

Gamma-emitting target radionuclides were not detected at concentration greater than their respective LLD. A summary of the gamma-emitting radionuclides results for the groundwater samples collected as part of the investigation that is the subject of this HIR is provided in Table 5.2 and presented graphically on Figure 5.7.

Other non-targeted radionuclides are included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides, which would otherwise indicate the potential of production from the Station.

5.3.3 SUMMARY OF FIELD MEASUREMENTS

Table 4.5 presents a summary of monitoring well purging parameters collected during the well purging and sampling activities. These field measurements included pH, dissolved oxygen, conductivity, turbidity, and temperature. The field parameters were typical of a shallow sand aquifer. The pH values ranged from 5.51 standard units to

10.42 standard units. The conductivity was indicative of a shallow water table system subject to surface water recharge.

Of note were the elevated turbidity readings above 900 NTU collected from the lower portion of the screen at MW-ZN-04S; however, the elevated turbidity readings are indicative of the very loose and fine-grained organic material at this well's lower screen interval, as shown on the MW-ZN-04S stratigraphic log. Overall, the readings were within the expected ranges for naturally occurring groundwater.

5.4 SURFACE WATER QUALITY

One surface water sample was collected from Lake Michigan at the location shown on Figure 4.1. This sample was analyzed for tritium, gamma-emitting radionuclides, and strontium-89/90. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. The analytical data reports are provided in Appendix D.

5.4.1 SUMMARY OF BETA-EMITTING RADIONUCLIDE ANALYTICAL RESULTS

Tritium was not detected at concentrations exceeding the LLD of 200 pCi/L. A summary of the tritium result for the surface water sample collected in this investigation is provided in Table 5.1 and shown on Figure 5.6.

Strontium-89/90 was not detected at concentration exceeding the LLD of 2.0 pCi/L. The strontium-89/90 result for the surface water sample collected in this investigation is provided in Table 5.2 and shown on Figure 5.7.

5.4.2 SUMMARY OF GAMMA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

Gamma-emitting target radionuclides were not detected at concentration exceeding their respective LLD. A summary of the gamma-emitting radionuclides results for the surface water sample collected in this investigation is provided in Table 5.2 and shown on Figure 5.7.

Other non-targeted radionuclides are included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and

thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

6.0 RADIONUCLIDES OF CONCERN AND SOURCE AREAS

This section discusses radionuclides evaluated in this investigation, potential sources of the radionuclides detected, and their distribution.

6.1 GAMMA-EMITTING RADIONUCLIDES

Gamma-emitting target radionuclides were not detected at concentration exceeding their respective LLD. Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

6.2 BETA-EMITTING RADIONUCLIDES

Strontium-89/90 was not detected in any of the samples collected at concentrations that were greater than the LLD of 2.0 pCi/L. Tritium was detected in one of the sixteen total sample locations. Concentrations of tritium ranged between less than the LLD of 200 pCi/L to 586 ± 141 pCi/L.

Since only tritium was detected above the radionuclides' LLDs, the following sections focus on tritium; specifically, providing general characteristics of tritium, potential sources, distribution in groundwater, and a conceptual model for migration.

6.3 TRITIUM

This section discusses the general characteristics of tritium, the distribution of tritium in groundwater and surface water, and the conceptual model of tritium release and migration.

6.3.1 GENERAL CHARACTERISTICS

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common forms of tritium are tritium gas and tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen. Tritiated

water behaves the same as ordinary water in both the environment and the body. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted primarily through urine within a month or so after ingestion. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity, and in special production reactors, where the isotopes lithium-7 and/or boron-10 are bombarded to produce tritium.

Although tritium can be a gas, its most common form is in water because, like non-radioactive hydrogen, radioactive tritium reacts with oxygen to form water. Tritium replaces one of the stable hydrogen atoms in the water molecule and is called tritiated water. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to helium-3 (^3He). This radioactive decay releases a beta particle (low-energy electron). The radioactivity of tritium is the source of the risk of exposure.

Tritium is one of the least dangerous radionuclides because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

6.3.2 DISTRIBUTION IN STATION GROUNDWATER

This section provides an overview of the lateral and vertical distribution of tritium detected in groundwater at the Station. Tritium was detected in groundwater at concentrations exceeding the LLD of 200 pCi/L.

Tritium concentrations in groundwater are presented on Figure 5.6. Tritium was only detected in groundwater samples from monitoring well MW-ZN-01S in May 2006 from both the upper sampling interval (261 ± 124 pCi/L, 22 feet bgs) and the lower sampling interval (586 ± 141 pCi/L, 35 feet bgs). Tritium was only detected in groundwater

samples from monitoring well MW-ZN-01S in June 2006 in the upper sampling interval (220 ± 123 pCi/L, 22 feet bgs). Tritium was not detected above the LLD of 200 pCi/L in June 2006 at the MW-ZN-01S lower sampling interval.

6.3.3 CONCEPTUAL MODEL OF TRITIUM RELEASE AND MIGRATION

This Section presents CRA's conceptual model of groundwater and tritium migration at the Station.

A conceptual model of groundwater and tritium migration is provided herein. This model is then used to discuss the recent detections of tritium observed during the hydrogeologic investigations presented in this HIR.

Groundwater flows within the Upper Sand Unit at the Station in response to the regional discharge point located to the east of the Station (Lake Michigan). Groundwater moving within the Upper Sand Unit is separated from the regional bedrock aquifer zones by the underlying low-permeability Silt-Clay Unit.

Groundwater in the Upper Sand Unit generally flows to the east and discharges to Lake Michigan. Groundwater flowing in Upper Sand Unit is affected by the building foundations which, in some cases, extend into the underlying glacial silts and clays. The sheet pile wall also limits the flow of groundwater towards Lake Michigan. There is no indication from the HIR investigation that tritium-impacted groundwater is migrating off the Station property.

6.3.4 ATTENUATION OF TRITIUM WITHIN THE SHALLOW GROUNDWATER SYSTEM

Tritium in the groundwater system would be affected by the infiltration from precipitation recharge. This could result in the upper water table zone of the sand aquifer having lower concentrations of tritium than deeper portions (these upper and lower zones are only separated by 10 feet).

The permeable nature of the Upper Sand Unit also supports attenuation of the tritium through lateral groundwater movement. The dispersion of the tritium as it flows through the Upper Sand Unit along with its natural decay rate will allow for reduction in concentrations over time and with distance from a release into the groundwater.

Tritium was not detected at concentrations exceeding the LLD of 200 pCi/L in the four temporary wells located downgradient of MW-ZN-01S and in surface water sample collected from Lake Michigan, which is the ultimate receptor of groundwater discharge from the Station. There is no indication from the HIR investigation that tritium-impacted groundwater is migrating off the Station property.

7.0 EXPOSURE PATHWAY ASSESSMENT

This section addresses the groundwater impacts from tritium and other radionuclides at the Station and potential risks to human health and the environment.

Based upon historical knowledge and data related to the Station operations, and based upon radionuclide analyses of groundwater samples, the primary constituent of concern (COC) is tritium. The discussions that follow are restricted to the exposure pathways related to tritium.

Teledyne Brown reports all samples to their statistically derived minimum detectable concentration (MDC) of approximately 150 to 170 pCi/L, which is associated with 95 percent confidence interval on their hardcopy reports. However, the laboratory uses a 99 percent confidence range (± 3 -sigma) for determining whether to report the sample activity concentration as detected or not. This 3-sigma confidence range typically equates to 150 (± 135.75) pCi/L.

Exelon has specified a LLD of 200 pCi/L for the Fleetwide assessment. Exelon has also required the laboratory to report related peaks identified at the 95 percent confidence level (2-sigma).

This HIR, therefore, screens and assesses data using Exelon's LLD of 200 pCi/L. As is outlined below, this concentration is also a reasonable approximation of the background concentration of tritium in groundwater at the Station.

7.1 HEALTH EFFECTS OF TRITIUM

Tritium is a radionuclide that decays by emitting a low-energy beta particle that cannot penetrate deeply into tissue or travel far in air. A person's exposure to tritium is primarily through the ingestion of water (drinking water) or through ingestion of water-bearing food products. Inhalation of tritium requires the water to be in a vapor form (i.e., through evaporation or vaporization due to heating). Inhalation is a minor exposure route when compared to direct ingestion or drinking of tritiated water. Absorption of tritium through skin is possible, but tritium exposure is more limited here versus direct ingestion or drinking of tritiated water.

7.2 BACKGROUND CONCENTRATIONS OF TRITIUM

The purpose of the following paragraphs is to establish a background concentration through review of various media.

7.2.1 GROUNDWATER

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium isotopes ${}^6\text{Li}$ (92.5% abundance) and ${}^7\text{Li}$ (7.5% abundance) present in crystalline rocks by neutrons produced by the radioactive decay of uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased during the 1950s and early 1960s, coinciding with the release of significant amounts of tritium to the atmosphere during nuclear weapons testing prior to the signing of the Limited Test Ban Treaty in 1963, which prohibited atmospheric nuclear tests.

7.2.2 PRECIPITATION DATA

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provided tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected world wide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at Stations through the U.S. from 1960 up to and including 2006.

Based on GNIP data for sample stations located in the U.S. Midwest including Chicago, St. Louis and Madison, Wisconsin, as well as Ottawa, Ontario, and data from the University of Chicago, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of

thermonuclear weapons. Tritium concentrations showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980.

The RadNet database for several stations in the U.S. Midwest (Chicago, Columbus, Indianapolis, Lansing, Madison, Minneapolis, Painesville, Toledo, and Welsch) did not show the same trend, which can be attributed to pre-1995 data handling procedures. The pre-1995 data were rounded to the nearest 100 pCi/L, which dampened out variances in the data. The post-1995 RadNet data, where rounding was not applied, exhibit much more scatter, and similar to the GNIP data, the vast majority of the data were less than 100 pCi/L.

CRA constructed a non-parametric upper tolerance limit with a confidence of 95 percent and coverage of 95 percent based on RadNet data for USEPA Region 5 from 2004 to 2005. The resulting upper tolerance limit is 133 pCi/L, which indicates that CRA is 95 percent confident that 95 percent of the ambient precipitation concentration results are below 133 pCi/L. The statistical confidence, however, must be compared with the limitations of the underlying RadNet data, which does not include the minimum detectable concentration for a majority of the measurements. Some of the RadNet values below 200 pCi/L may be approximated. Nevertheless, these results show a background contribution for precipitation of up to 133 pCi/L.

7.2.3 SURFACE WATER DATA

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Surface water data from the RadNet database for Illinois sampling stations include East Moline (Mississippi River), Moline (Mississippi River), Marseilles (Illinois River), Morris (Illinois River), Oregon (Rock River), and Zion (Lake Michigan). As is the case for the RadNet precipitation data, the pre-September 1995 Illinois surface water data was rounded to the nearest 100 pCi/L, creating a dampening of variances in the data. The post-1995 Illinois surface water data, similar to the post-1995 Midwest precipitation data, were less than 100 pCi/L, with the exception of the Moline (Mississippi River) station. Tritium surface water concentrations at this location varied between 100 and 800 pCi/L, which may reflect local natural or anthropogenic inputs.

The RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a ± 70 to 100 pCi/L 95 percent confidence bound on each given measurement. Therefore,

the typical background data provided may be subject to measurement uncertainty of approximately ± 70 to 100 pCi/L.

7.2.4 DRINKING WATER DATA

Tritium concentrations in drinking water from the RadNet database for three Illinois sampling stations (Chicago, Morris, and East Chicago) exhibit similar trends as the precipitation and surface water data. As with the precipitation and surface water data, the pre-1995 data have dampened out variances due to rounding the data to the nearest 100 pCi/L. The post-1995 results show tritium concentrations in samples of drinking water were less than 100 pCi/L.

7.2.5 EXPECTED TRITIUM BACKGROUND FOR THE STATION

As reported in the GNIP and RadNet databases, tritium concentrations in U.S. Midwest precipitation have typically been less than 100 pCi/L since 1980. Tritium concentrations reported in the RadNet database for Illinois surface water and groundwater, at least since 1995, have typically been less than 100 pCi/L. Based on USEPA Region 5's 2004 to 2005 RadNet precipitation data, 95 percent of the ambient concentrations of tritiated water in Illinois are expected to be less than 133 pCi/L, based on a 95 percent confidence limit. Tritium concentrations in surface water and drinking water at the Station are expected to be comparable or less based on historical data and trends.

Concentrations in groundwater similar to surface water and drinking water are expected to be less than precipitation values. The lower groundwater concentrations are related to the age of the groundwater as compared to the half-life of tritium. Deep aquifers in proximity to crystalline basement rock, however, can potentially show elevated concentrations of tritium due to lithogenic sources.

The Pre-Operational REMP report noted that lake water was sampled at five public water intakes. Generally, the gross beta radioactivity of Lake Michigan was less than 10 pCi/L. Typical values from throughout the Lake were between 3 to 6 pCi/L. Gross alpha radioactivity was typically less than 3 pCi/L (ComEd, 1971).

Tritium levels in Lake Michigan water were studied in the vicinity of Zion throughout 1970 (prior to the construction of the Station). The concentration of tritium in Lake Michigan near Zion ranged from approximately 311 ± 20 pCi/L to 374 ± 34 pCi/L and averaged 340 pCi/L. There was no statistical difference in average tritium levels among

the sample locations (eight sample locations from Kenosha to Waukegan) (ComEd, 1971).

As was noted in Section 7.0, the reporting limits for the tritium results are to an LLD of 200 pCi/L. This concentration also represents a reasonable representation of background groundwater quality, given the data for precipitation, surface water, and drinking water.

Based on the evaluation presented above, the background concentration for tritium at the Station is reasonably represented by the LLD of 200 pCi/L.

7.3 IDENTIFICATION OF POTENTIAL EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

There are two potential exposure pathways for tritium originating in or adjacent to the Station:

- potential groundwater migration off the Station property to private and public groundwater users; and
- potential groundwater migration off the Station property to Lake Michigan.

The following section provides an overview of each of these two potential exposure pathways for tritium in groundwater.

7.3.1 POTENTIAL GROUNDWATER MIGRATION TO DRINKING WATER USERS OFF THE STATION PROPERTY

Based upon the groundwater and surface water data presented in this HIR, groundwater flow is to the east towards Lake Michigan. The horizontal extent of the elevated concentrations of tritium in the direction of groundwater flow has been established, and is limited to the area around MW-ZN-01S. Tritium was not detected in the four temporary well installed near the shoreline above the LLD of 200 pCi/L. The tritium concentrations in groundwater samples collected from MW-ZN-01S ranged from less than LLD (most recently) to 586 ± 141 pCi/L (lower interval), 220 ± 123 pCi/L to 261 ± 124 pCi/L (upper interval), which are significantly less than the USEPA drinking water standard of 20,000 pCi/L. No tritium was detected above the LLD (200 pCi/L) in the other fourteen monitoring wells across the Station. In addition, there are no potable water supply wells downgradient of the Station or of monitoring well MW-ZN-01S.

The direction of groundwater flow is east towards Lake Michigan. Tritium was not detected at concentrations greater than the LLD (200 pCi/L) in the four temporary wells located downgradient of MW-ZN-01S. There is no potentially complete exposure pathway, and therefore there is no current risk of exposure associated with groundwater ingestion off the Station property.

7.3.2 POTENTIAL GROUNDWATER MIGRATION TO SURFACE WATER USERS

Based upon the groundwater and surface water data presented in this HIR, groundwater flow is to the east towards Lake Michigan. The horizontal extent of the elevated concentrations of tritium is limited to the area around MW-ZN-01S. The tritium concentrations detected in groundwater samples collected from MW-ZN-01S ranged from less than LLD (200 pCi/L) (most recently) to 586 ± 141 pCi/L (lower interval) and 220 ± 123 pCi/L to 261 ± 124 pCi/L (upper interval), which are significantly less than the USEPA drinking water standard of 20,000 pCi/L. No tritium was detected above the LLD (200 pCi/L) in the other 14 monitoring wells across the Station. In addition, no tritium was detected above the LLD (200 pCi/L) in the downgradient monitoring wells (MW-ZN-11S and TW-ZN-100 through TW-ZN-103) and the surface water sample collected from Lake Michigan at station SW-ZN-01, adjacent to the Station.

The Lake County Public Works Department obtains its water for the City of Zion from Lake Michigan by means of an intake pipe located approximately 1 mile to the north of the Station and extending 3,000 feet into the Lake. Since tritium was not detected at concentrations greater than LLD (200 pCi/L) in the four temporary wells and MW-ZN-11S (which are downgradient of MW-ZN-01S) or the Lake Michigan surface water sample, there is an incomplete exposure pathway. Therefore, there is no current risk of exposure associated with ingestion and recreational use off the Station property.

7.4 SUMMARY OF POTENTIAL TRITIUM EXPOSURE PATHWAYS

There are two potential groundwater exposure pathways for tritium originating at the Station:

- groundwater migration off the Station Property to private and public groundwater users (drinking water exposure); and
- groundwater migration off the Station Property to Lake Michigan (drinking water exposure and recreational exposure).

Based upon the groundwater and surface water data provided and referenced in this investigation, none of the potential receptors are at risk of exposure to concentrations of tritium in excess of USEPA drinking water standard (20,000 pCi/L).

7.5 OTHER RADIONUCLIDES

Target radionuclides were not detected at concentrations greater than their respective LLDs in the groundwater and surface water samples collected. Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

8.0 CONCLUSIONS

Based on all of the studies completed to date at the Zion Station, CRA concludes:

Groundwater Flow

- The water table is in the Upper Sand Unit. The depth to water ranged from 5 to 14 feet bgs.
- The shallow groundwater at the Station generally flows to the east towards Lake Michigan.
- Groundwater flow at the Station is affected by the construction (basements/foundations) of the Reactor, Turbine, and Auxiliary Buildings, which were constructed into the Silt-Clay Unit. These buildings are barriers to lateral flow.
- A sheet pile wall was initially installed to limit the infiltration of Lake Michigan water into the construction excavation for the main Station buildings. The wall currently influences groundwater flow on the east side of the Station by diverting the groundwater around the wall.

Groundwater Quality

- None of the detected tritium concentrations in the groundwater exceeded the USEPA drinking water standard of 20,000 pCi/L.
- Tritium was not detected at concentrations greater than the LLD (200 pCi/L) in 14 of the 15 monitoring wells collected as part of this investigation.
- Tritium was detected in groundwater samples collected from monitoring well MW-ZN-01S. These concentrations ranged from less than LLD (most recently) to 586 ± 141 pCi/L (lower interval) and 220 ± 123 pCi/L to 261 ± 124 pCi/L (upper interval).
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in any of the sample collected as part of this investigation.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any sample collected as part of this investigation.
- Tritium is not migrating off the Station property.

Surface Water Quality

- Tritium was not detected in the surface water sample at a concentration greater than the USEPA drinking water standard of 20,000 pCi/L.
- Tritium was not detected in the surface water sample at a concentration greater than the LLD of 200 pCi/L.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their LLDs in the sample collected as part of this investigation.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in the sample collected as part of this investigation.

AFE-Zion-1: Main Complex Area, AFE-Zion-3: Unit 2 (Northern) AST Area, and AFE-Zion-4: Wastewater Treatment Plant Area

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in any of the groundwater samples collected from the monitoring wells in the vicinity of AFEs Zion-1, 3, and 4.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any of the groundwater samples collected from the monitoring wells in the vicinity of AFEs-Zion-1, 3, and 4.
- Tritium was detected in groundwater samples collected from monitoring well MW-ZN-01S. These concentrations ranged from less than LLD (most recently) to 586 ± 141 pCi/L (lower interval) and 220 ± 123 pCi/L to 261 ± 124 pCi/L (upper interval). The tritium is localized to the area in the vicinity of monitoring well MW-ZN-01S. No tritium was detected in the four temporary wells and MW-ZN-11S, located downgradient of monitoring well MW-ZN-01S. This well is located in close proximity to AFEs Zion 1, 3, and 4. The source of tritium in this location is likely attributable to historical releases in this area. However, the most recent sample results are within the range of background concentrations.

AFE-Zion-2: Unit 1 (Southern) Aboveground Storage Tank (AST) Area

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in any of the groundwater samples collected from the monitoring wells in the vicinity of AFE-Zion-2.

- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any of the groundwater samples collected from the monitoring wells in the vicinity of AFE-Zion-2.
- Tritium was not detected at concentrations greater than the LLD of 200 pCi/L in any of the groundwater samples collected from the monitoring wells near AFE-Zion-2.
- There have been no impacts to groundwater from AFE-Zion-2.

Potential Receptors

Based on the results of this investigation⁴, there is no current risk from exposure to radionuclides associated with licensed plant operations through any of the identified potential exposure pathways.

General Conclusions

- Based on the results of this investigation, tritium is not migrating off the Station property at detectable concentrations; and
- Based on the results of this investigation, there are no known active releases into the groundwater at the Station.

⁴ Using the LLDs specified in this HIR.

9.0 RECOMMENDATIONS

The following presents CRA's recommendations for proposed activities to be completed at the Station.

9.1 DATA GAPS

Based on the results of this hydrogeologic investigation, there are no data gaps remaining to support CRA's conclusions regarding the characterization of the groundwater regime and potential impacts from radionuclides at the Station.

9.2 GROUNDWATER MONITORING

Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

Temporary Well Abandonment

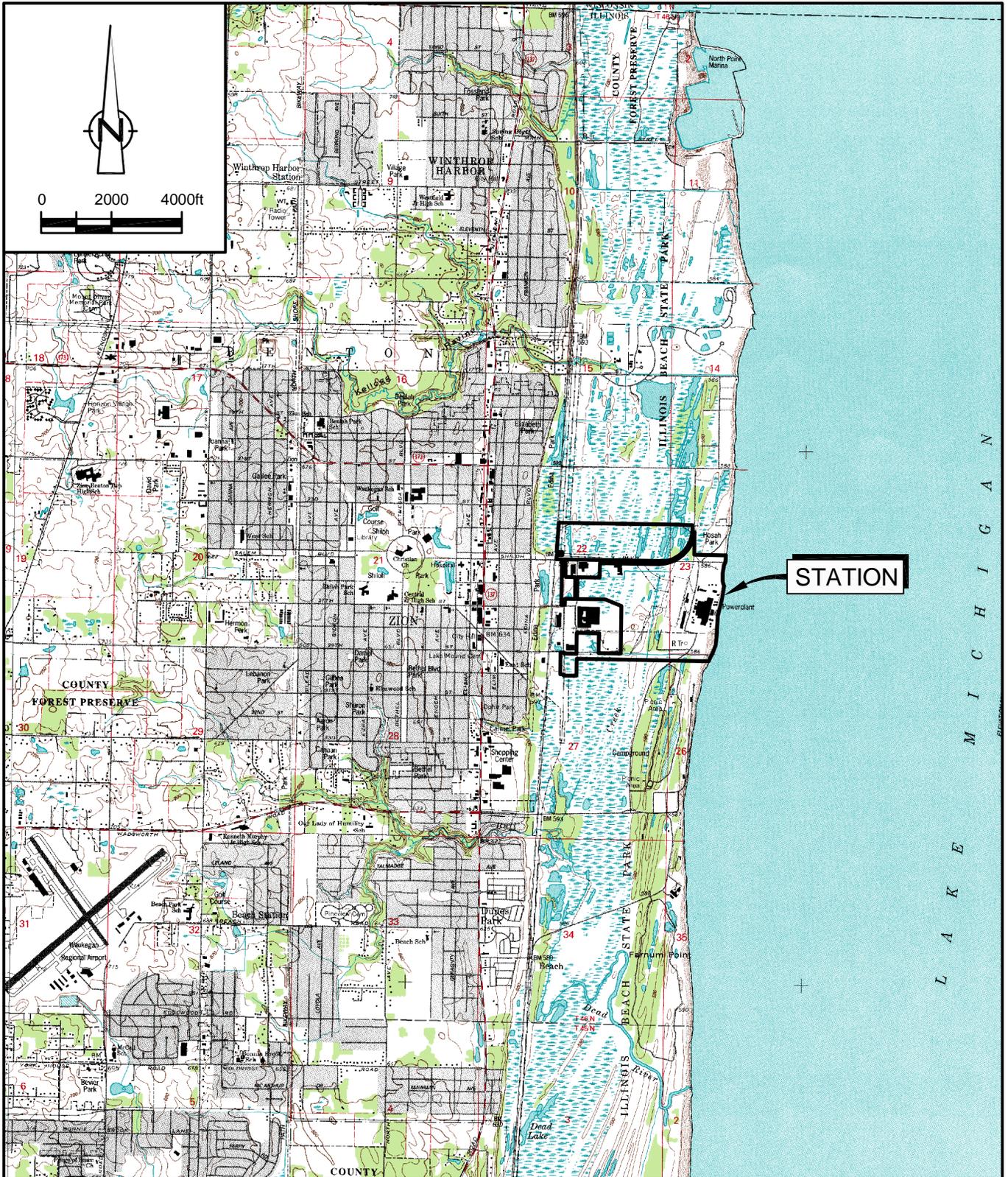
Four temporary wells were installed on the beach between the sheet pile wall and the normal high water mark. These temporary wells are not expected to survive the winter due to storms and ice buildup and should be properly abandoned before the onset of cold weather.

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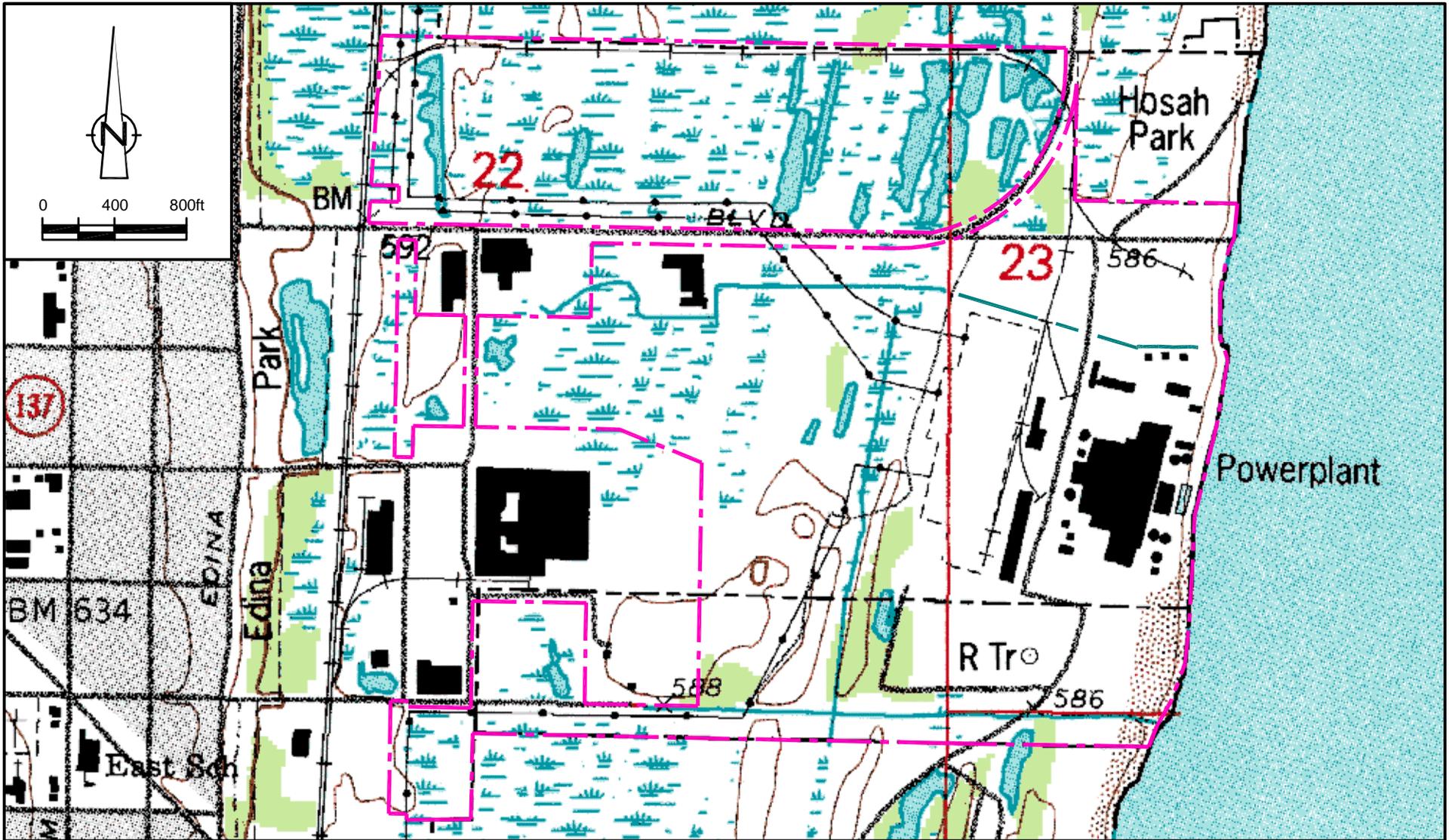


SOURCE: USGS QUADRANGLE MAP;
ZION, ILLINOIS (1993)

figure 1.1

STATION LOCATION MAP
ZION STATION
EXELON GENERATION COMPANY, LLC
Zion, Illinois





SOURCES: MAP: USGS QUADRANGLE MAP;
 ZION, ILLINOIS (1993)
 WELL LOCATIONS: BANKS INFORMATION SOLUTIONS, INC.
 WATER WELL REPORT, JUNE 7, 2006

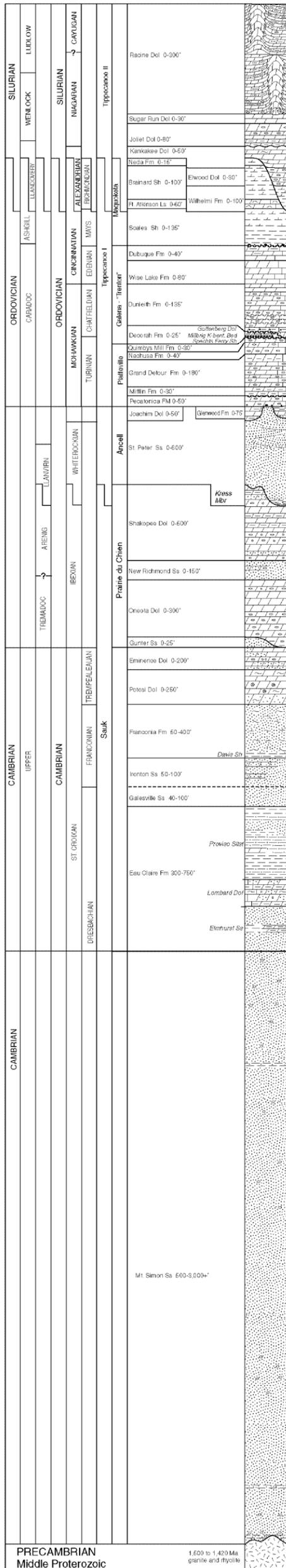


LEGEND

- - - PROPERTY LINE
- DITCH

figure 2.1

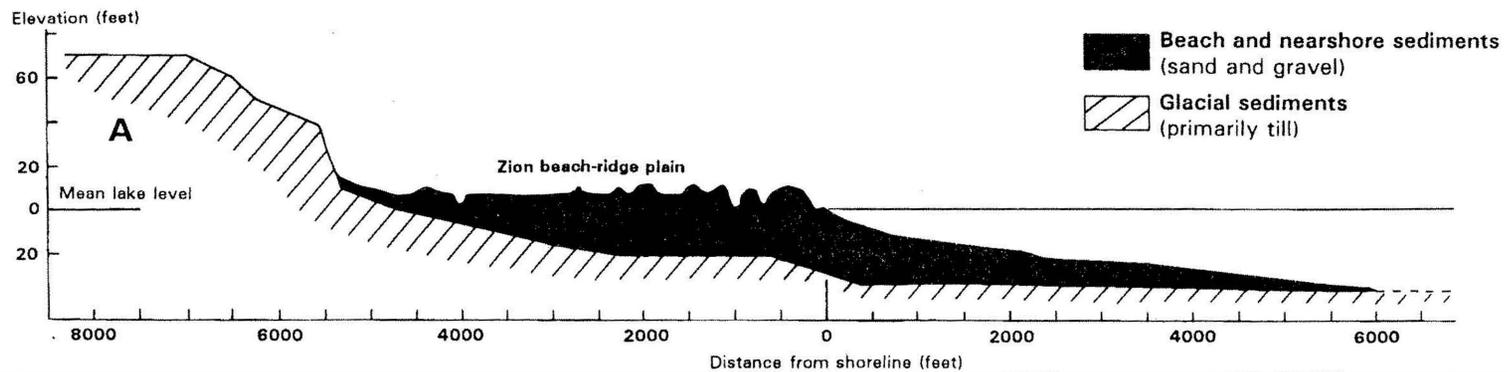
STATION SURFACE WATER FEATURES
 ZION STATION
 EXELON GENERATION COMPANY, LLC
 Zion, Illinois



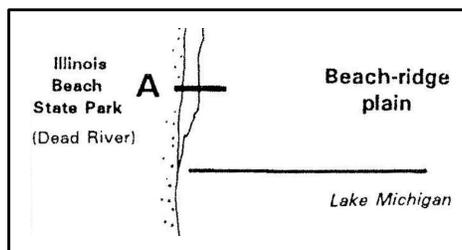
SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY,
INTRODUCTION TO 3-D VISUALIZATION OF
BEDROCK IN LAKE COUNTY, ILLINOIS

figure 2.2
REGIONAL STRATIGRAPHIC CROSS-SECTION
ZION STATION
EXELON GENERATION COMPANY, LLC
Zion, Illinois





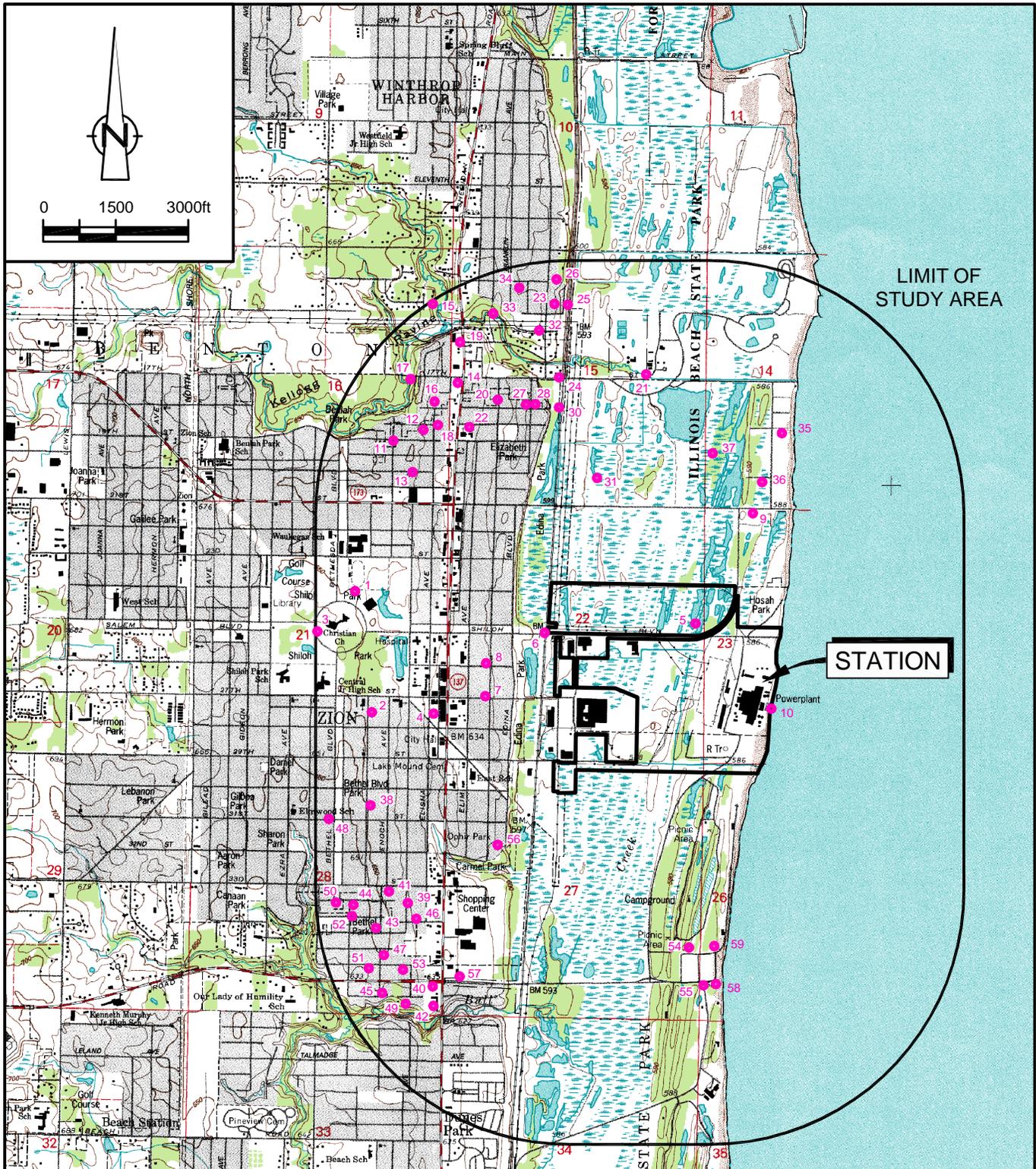
SOURCE: GUIDE TO THE GEOLOGY OF ILLINOIS BEACH STATE PARK AND THE ZION BEACH-RIDGE PLAIN, LAKE COUNTY, ILLINOIS STATE GEOLOGICAL SURVEY, 2000.



CROSS-SECTION LOCATION

figure 2.3

CROSS-SECTION OF THE ZION BEACH-RIDGE PLAIN
 ZION STATION
 EXELON GENERATION COMPANY, LLC
 Zion, Illinois

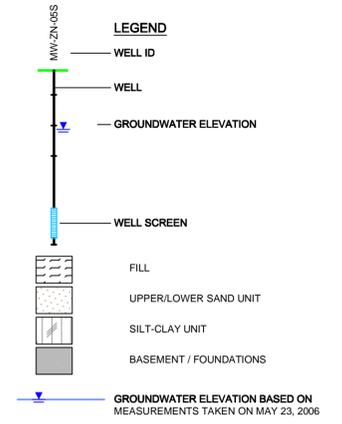
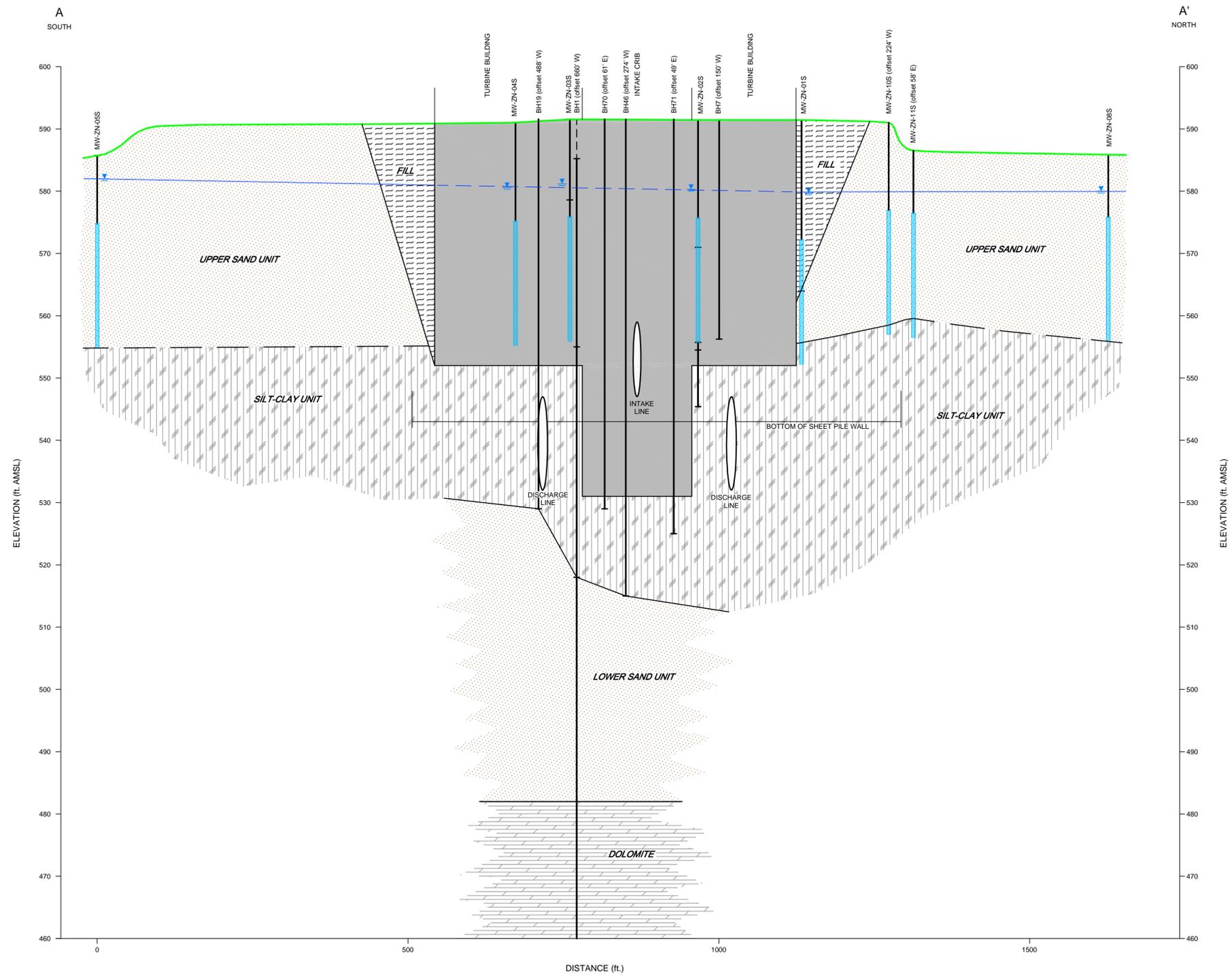


SOURCES: MAP: USGS QUADRANGLE MAP;
 ZION, ILLINOIS (1993)
 WELL LOCATIONS: BANKS INFORMATION SOLUTIONS, INC.
 WATER WELL REPORT, JUNE 7, 2006

● 40 GROUNDWATER WELL/WELL CLUSTER

figure 2.4
 PRIVATE/PUBLIC WATER SUPPLY WELL LOCATIONS
 ZION STATION
 EXELON GENERATION COMPANY, LLC
 Zion, Illinois





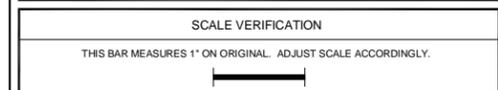
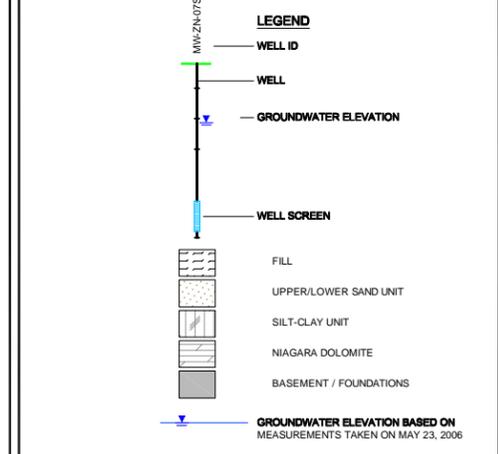
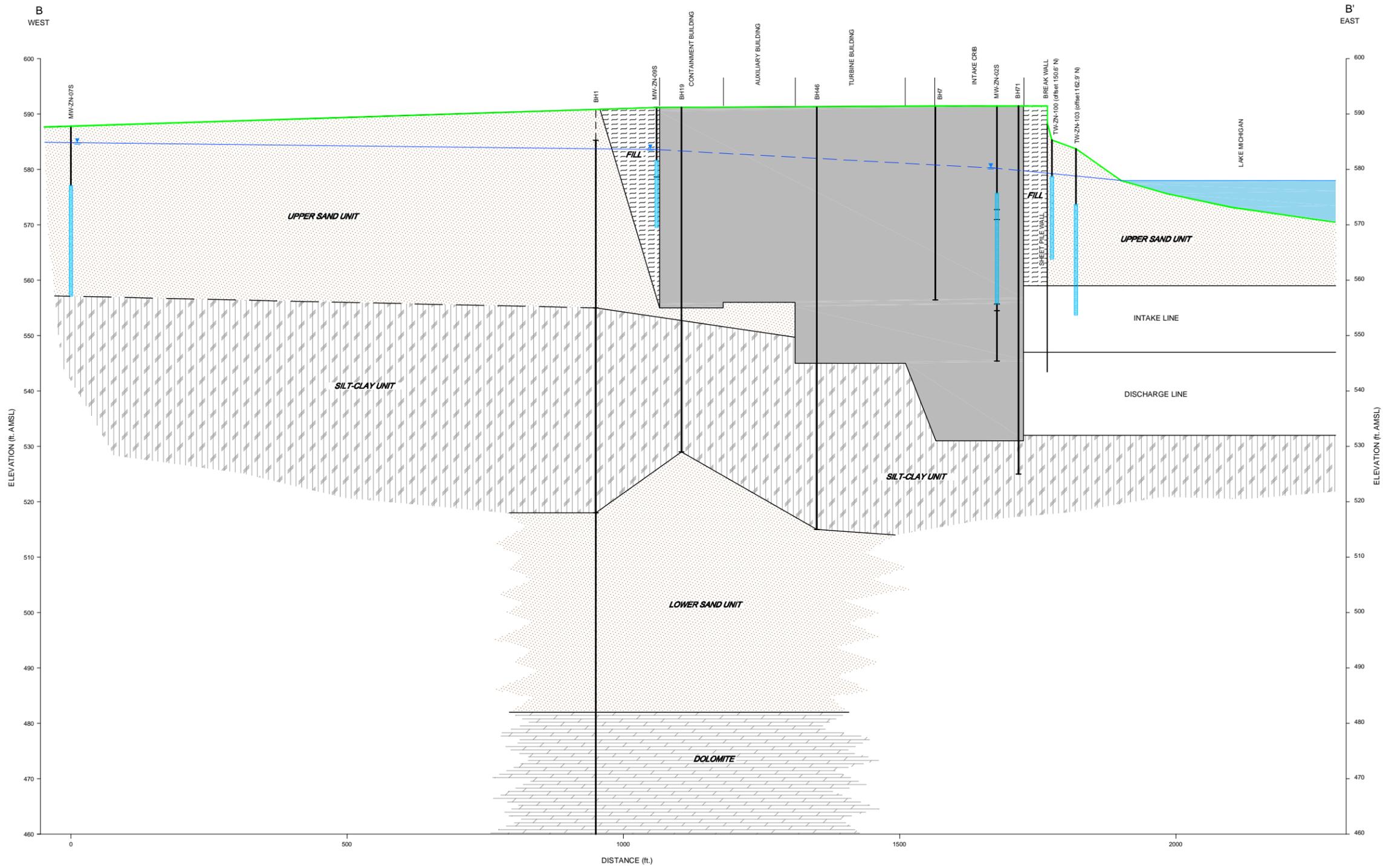
SCALE VERIFICATION
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

EXELON GENERATION COMPANY, LLC
FLEETWIDE ASSESSMENT
GEOLOGIC CROSS SECTION A-A'
ZION STATION
ZION, ILLINOIS



Source Reference:

Project Manager: S. QUIGLEY	Reviewed By: J. RABY	Date: AUGUST 2006
Scale: AS SHOWN	Project N ^o : 45136-30	Report N ^o : 022
		Drawing N ^o : figure 5.2



EXELON GENERATION COMPANY, LLC

FLEETWIDE ASSESSMENT

GEOLOGIC CROSS SECTION B-B'

ZION STATION

ZION, ILLINOIS



Source Reference:

Project Manager: S. QUIGLEY	Reviewed By: J. RABY	Date: AUGUST 2006
Scale: AS SHOWN	Project No: 45136-30	Report No: 022
		Drawing No: figure 5.3

TABLE 4.1

**SUMMARY OF MONITORING WELL INSTALLATION DETAILS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

Well Location	X-coord. (Site-Specific Coordinates)	Y-coord.	Surface Elevation (NGVD)	Reference Elevation (NGVD)	Installation Date	Boring Total Depth (ft bgs)	Screened Interval				Well Diameter (inches)	Well Construction
							Top (ft bgs)	Bottom	Top (ft NGVD)	Bottom		
MW-ZN-01S	1424319.58	15418801.80	591.43	594.10	5/1/2006	39	19	39	572.43	552.43	2	2-inch PVC Screen
MW-ZN-02S	1424278.62	15418640.44	591.21	593.78	5/2/2006	45	15	35	576.21	556.21	2	2-inch PVC Screen
MW-ZN-03S	1424216.30	15418443.87	591.54	594.02	5/2/2006	35.3	15.3	35.3	576.24	556.24	2	2-inch PVC Screen
MW-ZN-04S	1424212.26	15418356.60	591.01	593.82	5/3/2006	35	15	35	576.01	556.01	2	2-inch PVC Screen
MW-ZN-05S	1423805.72	15417820.38	585.72	588.64	5/4/2006	30	10	30	575.72	555.72	2	2-inch PVC Screen
MW-ZN-06S	1422629.16	15418474.29	589.78	592.66	5/5/2006	30	10	30	579.78	559.78	2	2-inch PVC Screen
MW-ZN-07S	1422858.29	15419254.58	587.08	589.82	5/6/2006	30	10	30	577.08	557.08	2	2-inch PVC Screen
MW-ZN-08S	1424335.21	15419294.95	585.85	588.73	5/5/2006	30	10	30	575.85	555.85	2	2-inch PVC Screen
MW-ZN-09S	1423689.57	15418596.56	591.18	593.84	5/5/2006	19	9	19	582.18	572.18	2	2-inch PVC Screen
MW-ZN-10S	1424100.31	15418949.08	591.00	593.70	7/13/2006	34	14	34	577.00	557.00	2	2-inch PVC Screen
MW-ZN-11S	1424383.37	15418979.86	586.50	589.50	7/14/2006	30	10	30	576.50	556.50	2	2-inch PVC Screen
TW-ZN-100	1424390.02	15418713.68	585.30	590.00	7/7/2006	22	6.5	21.5	578.80	563.80	1	1-inch PVC Screen
TW-ZN-101	1424414.23	15418779.65	584.30	588.70	7/7/2006	19	4	19	580.30	565.30	1	1-inch PVC Screen
TW-ZN-102	1424432.51	15418865.75	584.30	588.60	7/7/2006	21	6	21	578.30	563.30	1	1-inch PVC Screen
TW-ZN-103	1424431.73	15418705.47	583.70	587.50	7/7/2006	30	10	30	573.70	553.70	1	1-inch PVC Screen

Notes:

NGVD - National Geodetic Vertical datum

ft bgs - feet below ground surface

PVC - polyvinyl chloride

TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

Sample Location	Date	Well Volume (gallons)	Gallons Purged	Water Level	pH (Std. Units)	Conductivity (µS/cm) ¹	Temperature (°C)	Turbidity (ntu) ²	Observations	Pump Type
MW-ZN-01S	5/3/2006	5.0	5	13.3	NA	NA	NA	NA	brown, turbid, silty	Peristaltic
			10		7.46	757	17.0	> 1000	brown, turbid, silty	
			15		NA	NA	NA	NA	brown, turbid, silty	
			20		7.38	699	17.0	> 1000	brown, turbid, silty	
			25		7.20	662	15.7	> 1000	brown, turbid, silty	
			30		7.31	640	16.1	> 1000	brown, turbid, silty	
			35		7.33	633	17.1	> 1000	brown, turbid, silty	
			40			622	16.5	> 1000	brown, turbid, silty	
			45		7.48	607	19.2	> 1000	brown, turbid, silty	
			50		7.43	599	16.6	> 1000	brown, turbid, silty	
			55		7.41	591	16.5	340	brown, turbid, silty	
			60		7.41	593	16.3	164	brown, turbid, silty	
			65		7.43	593	16.3	164	brown, turbid, silty	
			70		7.44	580	17.4	99.6	brown, turbid, silty	
			75		7.45	589	15.9	95.3	brown, turbid, silty	
80	7.43	586	16.1	82	brown, turbid, silty					
MW-ZN-02S	5/4/2006	3.5	4	13.6	7.97	653	12.5	> 1000	silty, gray	Peristaltic
			8		7.80	614	14.6	> 1000	silty, gray	
			12		7.74	605	14.5	> 1000	silty, gray	
			18		7.83	595	14	> 1000	silty, gray	
			22		7.63	582	13.3	> 1000	silty, gray	
			26		7.64	577	13	> 1000	silty, gray	
			30		7.62	199.5	12.6	> 1000	silty, gray	
			34		7.58	95.6	13.3	> 1000	silty, gray	
			40		7.57	196.3	12.6	> 1000	silty, gray	
			44		7.61	195.1	12.9	896	getting less cloudy	
48	7.60	96.3	12.8	702	getting less cloudy					

TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

Sample Location	Date	Well Volume (gallons)	Gallons Purged	Water Level	pH (Std. Units)	Conductivity ($\mu\text{S/cm}$)¹	Temperature ($^{\circ}\text{C}$)	Turbidity (ntu)²	Observations	Pump Type
MW-ZN-03S	5/5/2006	3.72	4	13.12	7.44	666	11.3	> 1000	cloudy, brown	Peristaltic
			8		7.41	628	11.3	> 1000	cloudy, brown	
			12		7.46	608	10.9	> 1000	cloudy, brown	
			16		7.43	604	10.5	> 1000	cloudy, brown	
			20		7.47	200	10.7	> 1000	cloudy, brown	
			24		7.43	192.2	10.4	> 1000	cloudy, brown	
			28		7.43	188.8	10.7	> 1000	cloudy, brown	
			32		7.40	188.0	10.9	834	cloudy, brown	
			36		7.42	186.1	10.6	838	cloudy, brown	
			40		7.40	181.3	10.5	> 1000	cloudy, brown	
			44		7.40	181.7	10.9	> 1000	cloudy, brown	
			48		7.40	178.9	10.4	> 1000	cloudy, brown	
			52		7.41	177.0	10.4	1000	cloudy, brown	
			MW-ZN-04S		5/5/2006		8	14.27	7.24	
12	7.50	185.5		12.6			> 1000		cloudy, brown	
16	7.51	553		12.8			> 1000		cloudy, brown	
20	7.50	179.0		12.8			> 1000		cloudy, brown	
24	7.49	177.6		12.8			689		cloudy, brown	
28	7.50	176.5		12.8			508		cloudy, brown	
32	7.48	175.2		12.8			312		slightly cloudy, brown	
36	7.48	176.0		12.6			267		slightly cloudy, brown	
40	7.47	173.4		12.6			180		slightly cloudy, brown	
44	7.47	173.4		12.6			114		slightly cloudy, brown	
48	7.46	172.2		12.6			85.1		slightly cloudy, brown	
52	7.46	171.7		12.6			52.8		slightly cloudy, brown	

TABLE 4.2
SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Gallons Purged</i>	<i>Water Level</i>	<i>pH</i>	<i>Conductivity</i>	<i>Temperature</i>	<i>Turbidity</i>	<i>Observations</i>	<i>Pump Type</i>
					<i>(Std. Units)</i>	<i>(µS/cm) ¹</i>	<i>(°C)</i>	<i>(ntu) ²</i>		
MW-ZN-05S	5/8/2006	4.1	5	25.63	7.28	140.0	12.4	> 1000	cloudy, brown	Peristaltic
			10		7.21	141.5	12.6	879	cloudy, brown	
			15		7.22	142.3	12.8	> 1000	cloudy, brown	
			20		7.25	140.7	12.5	588.0	cloudy, brown	
			25		7.25	142.2	12.5	228.00	slightly cloudy, brown	
			30		7.25	144.3	12.3	482.00	slightly cloudy, brown	
			35		7.22	147.1	12.5	60.00	clear	
			40		7.24	145.2	12.6	32.6	clear	
			45		7.23	144.5	12.7	19.7	clear	
			50		7.23	144.6	12.7	16	clear	
			55		7.25	144.0	12.7	16.2	clear	
			60		7.25	144.0	12.6	10.2	clear	
			MW-ZN-06S		5/8/2006	3.52	3.5	3.52	7.12	
7.0	7.09	133.7		10.3			> 1000		silty, gray	
10.5	7.08	137.6		11.0			> 1000		silty, gray	
14.0	7.05	137.6		10.3			> 1000		silty, gray	
17.5	7.04	139.0		10.7			> 1000		silty, gray	
21.0	7.35	122.5		10.8			1000		silty, gray	
24.5	7.24	124.7		10.5			232		clearer	
28.0	7.13	126.8		10.0			> 1000		clear	
31.5	7.07	128.3		10.3			520		clear	
35.0	7.08	128.5		10.2			148		silty	
38.5	7.03	128.8		10.0			> 1000		silty	
41.0	6.99	132.0		10.5			458		clear	
44.5	7.10	129.1		10.4			143		clear	
48	7.01	131.4	10.5	137.8	clear					

TABLE 4.2
SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS

Sample Location	Date	Well Volume (gallons)	Gallons Purged	Water Level	pH (Std. Units)	Conductivity (µS/cm) ¹	Temperature (°C)	Turbidity (ntu) ²	Observations	Pump Type
MW-ZN-07S	5/8/2006	4.3	4.3	5.20	7.15	139.5	10.5	> 1000	silty, gray	Peristaltic
			8.6		7.11	141.3	10.7	> 1000	silty, gray	
			12.9		7.11	137.6	10.8	> 1000	silty, gray	
			16.2		7.13	136.1	10.6	> 1000	silty, gray	
			20.5		7.13	139.0	10.7	> 1000	silty, gray	
			24.8		7.05	138.6	10.3	> 1000	silty, gray	
			29.1		7.05	137.6	10.5	872	silty, gray	
			33.4		7.07	138.2	10.3	569	silty, gray	
			37.7		7.07	113.7	10.7	> 1000	silty, gray	
			42.0		7.06	140.1	10.4	520	silty, gray	
			45.3		7.06	138.5	10.8	213	silty, gray	
			49.6		7.04	139.3	10.4	89.7	silty, gray	
			MW-ZN-08S		5/8/2006	3.86	3.9	8.17	7.45	
9.8	7.47	136.8		12.8			1000		NA	
11.7	7.40	138.5		12.9			628		NA	
15.6	7.42	139.4		13.3			> 1000		NA	
19.5	7.42	138.4		12.6			898		NA	
23.4	7.41	138.1		12.6			898		NA	
27.3	7.41	141.5		13.3			898		NA	
31.2	7.42	138.1		13.0			387		NA	
35.1	7.33	138.1		12.6			198		NA	
39.0	7.41	138.4		13.0			101		NA	
42.9	7.39	139.3		12.4			75.2		NA	
46.8	7.42	138.7	12.6	50.9	NA					
MW-ZN-09S	5/8/2006	1.58	2	9.89	8.97	158.7	11.9	> 1000	cloudy, gray	Peristaltic
			4		9.13	159.7	11.7	> 1000	septic odor	
			6		9.18	158.6	11.7	> 1000	septic odor	
			8		9.15	156.3	11.7	484	septic odor	
			10		9.13	155.3	11.7	245	slightly cloudy, gray	
			12		9.00	152.1	11.8	> 1000	slightly cloudy, gray	
			14		9.10	151.1	11.8	277	slightly cloudy, gray	
			16		9.07	150.2	11.8	44.7	slightly cloudy, gray	
			18		9.09	148.6	11.8	13.10	clear, septic odor	
			20		9.09	147.7	11.7	9.93	clear, septic odor	
			22		9.04	147.2	11.7	8.67	clear, septic odor	

TABLE 4.2
SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Gallons Purged</i>	<i>Water Level</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm) ¹</i>	<i>Temperature (°C)</i>	<i>Turbidity (ntu) ²</i>	<i>Observations</i>	<i>Pump Type</i>
MW-ZN-10S	7/14/2006	4	90*	13.58	6.89	913.0	16.7	151.00	cloudy	Peristaltic
			94		7.18	776.0	15.0	132.00	cloudy	
			98		7.26	738.0	14.0	281.00	cloudy	
			102		7.34	748.0	13.8	112	clear	
			106		7.37	738.0	13.8	75.5	clear	
MW-ZN-11S	7/14/2006	3	3	10.5	7.47	863.0	17.3	>1000	cloudy, brown	Peristaltic
			6		7.31	842.0	16.8	>1000	cloudy, brown	
			9		7.35	839.0	16.1	>1000	cloudy, brown	
			12		7.36	832.0	16.2	243	clear	
			15		7.31	828.0	16.0	162	clear	
			18		7.31	806.0	16.0	88.80	clear	
			24		7.28	654.0	16.7	>1000	clear	
			27		7.28	827.0	15.9	258.00	clear	
			30		7.33	503.0	16.7	83.7	clear	
			33		7.33	791.0	16.4	52	clear	
			36		7.27	802	16.2	105	clear	
			45		7.27	799	15.6	50	clear	
			51		7.36	792	15.6	23.6	clear	
56	7.27	798	15.7	22	clear					

Notes:

¹ µS/cm - microSiemens per centimeter

² ntu - nephelometric turbidity units

* purged 90 gallons from well before taking readings

TABLE 4.3

SUMMARY OF GROUNDWATER AND SURFACE WATER ELEVATIONS
 FLEETWIDE ASSESSMENT
 ZION STATION
 ZION, ILLINOIS

<i>Sample Location</i>	<i>Reference Elevation (NGVD)</i>	<i>May 23, 2006</i>	
		<i>Depth to Water (ft Below Reference)</i>	<i>Groundwater Elevation (NGVD)</i>
MW-ZN-01S	594.10	14.41	579.69
MW-ZN-02S	593.78	13.48	580.30
MW-ZN-03S	594.02	12.84	581.18
MW-ZN-04S	593.82	13.23	580.59
MW-ZN-05S	588.64	6.67	581.97
MW-ZN-06S	592.66	7.71	584.95
MW-ZN-07S	589.82	5.02	584.80
MW-ZN-08S	588.73	8.73	580.00
MW-ZN-09S	593.84	9.99	583.85
Lake Michigan (average)	577.97	--	--
<i>Sample Location</i>	<i>Reference Elevation (NGVD)</i>	<i>July 27, 2006</i>	
		<i>Depth to Water (ft Below Reference)</i>	<i>Groundwater Elevation (NGVD)</i>
MW-ZN-01S	594.10	14.80	579.30
MW-ZN-02S	593.78	13.78	580.00
MW-ZN-03S	594.02	13.37	580.65
MW-ZN-04S	593.82	13.23	580.59
MW-ZN-05S	588.64	8.01	580.63
MW-ZN-06S	592.66	9.47	583.19
MW-ZN-07S	589.82	6.47	583.35
MW-ZN-08S	588.73	9.30	579.43
MW-ZN-09S	593.84	11.13	582.71
MW-ZN-10S	593.67	13.72	579.95
MW-ZN-11S	589.47	10.65	578.82
TW-ZN-100	590.01	10.62	579.39
TW-ZN-101	588.68	10.27	578.41
TW-ZN-102	588.58	10.33	578.25
TW-ZN-103	587.49	9.03	578.46
Lake Michigan (average)	577.93	--	--

Notes:

NGVD - National Geodetic Vertical datum

TABLE 4.4

**SAMPLE KEY
FLEETWIDE ASSESSMENT
ZION STATION
ZION , ILLINOIS**

<i>Sample Location</i> ⁽¹⁾	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Date</i>	<i>Matrix</i>	<i>Analyses</i>
MW-ZN-08S(L)	WG-Zion-MW-8L-052406-MS-001		5/24/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-04S(U)	WG-Zion-MW-4U-052406-MB-002		5/24/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-08S(U)	WG-Zion-MW-8U-052406-MS-003		5/24/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-04S(L)	WG-Zion-MW-4L-052406-MB-004		5/24/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-07S(U)	WG-Zion-MW-7U-052406-MS-005		5/24/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-07S(L)	WG-Zion-MW-7L-052506-MS-007		5/25/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-06S(L)	WG-Zion-MW-6L-052506-MS-009		5/25/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-03S(U)	WG-ZN-MW-ZN-03U-052506-DS-01		5/25/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-03S(U)	WG-ZN-MW-ZN-03U-052506-DS-02	Duplicate (01)	5/25/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-03S(L)	WG-ZN-MW-ZN-03L-052506-DS-03		5/25/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-02S(U)	WG-ZN-MW-ZN-02U-052606-DS-04		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-01S(U)	WG-ZN-MW-ZN-01U-052606-DS-05		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-02S(L)	WG-ZN-MW-ZN-02L-052606-DS-06		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-01S(L)	WG-ZN-MW-ZN-01L-052606-DS-07		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-09S	WG-ZN-MW-ZN-09-052606-DS-08		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-09S	WG-ZN-MW-ZN-09-052606-DS-09	Duplicate (08)	5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-06S(U)	WG-Zion-MW-6U-052606-MS-011		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-05S(L)	WG-Zion-MW-5L-052606-MS-013		5/26/06	Groundwater	Tritium / Target Radionuclides
SW-ZN-1	WS-Zion-Lake-052606-MS-015		5/26/06	Surface Water	Tritium / Target Radionuclides
MW-ZN-05S(U)	WG-Zion-MW-5U-052606-MS-017		5/26/06	Groundwater	Tritium / Target Radionuclides
MW-ZN-10S(L)	WG-ZN-MW-ZN-10L-072806-MS-005		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-ZN-10S(U)	WG-ZN-MW-ZN-10U-072806-MS-003		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-ZN-10S(U)	WG-ZN-MW-ZN-10U-072806-MS-004		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-ZN-11S(L)	WG-ZN-MW-ZN-11L-072806-TL-002		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-ZN-11S(U)	WG-ZN-MW-ZN-11U-072806-TL-001		7/28/2006	Groundwater	Tritium / Target Radionuclides
TW-ZN-100	GW-071706-JL-TW-ZN-100		7/17/2006	Groundwater	Tritium / Target Radionuclides

TABLE 4.4

**SAMPLE KEY
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ⁽¹⁾	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Date</i>	<i>Matrix</i>	<i>Analyses</i>
TW-ZN-101	GW-071706-JL-TW-ZN-101		7/17/2006	Groundwater	Tritium / Target Radionuclides
TW-ZN-102	GW-071706-JL-TW-ZN-102		7/17/2006	Groundwater	Tritium / Target Radionuclides
TW-ZN-103	GW-071706-JL-TW-ZN-103		7/17/2006	Groundwater	Tritium / Target Radionuclides

Notes:

QC - Quality Control

Target Radionuclides: Sr-89/90, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140, and La-140

Duplicate (08) - Duplicate of sample number in parenthesis

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
MW-ZN-01S(U)	5/26/2006	5	14.67	200	6.33	822	15.01	NM	0.71	333.10	Peristaltic
		10	14.67	200	6.62	812	14.45	5.38	0.54	114.3	
		15	14.67	200	7.03	810	14.42	5.36	0.46	-11.2	
		20	14.67	200	7.08	822	14.81	5.13	0.55	-100.0	
		25	14.67	200	7.07	821	14.85	5.44	0.53	-101.6	
		30	14.67	200	7.12	814	14.78	5.36	0.51	-104.4	
MW-ZN-01S(U)	6/28/2006	5	14.57	305	7.53	877	15.61	4.51	0.71	NM	Peristaltic
		10	14.57	305	7.54	889	15.56	4.25	0.60	NM	
		15	14.57	305	7.56	896	15.58	3.80	0.50	NM	
		20	14.57	305	7.58	901	15.65	3.81	0.47	NM	
		25	14.57	305	7.60	905	15.59	4.23	0.44	NM	
		30	14.58	305	7.59	908	15.55	4.45	0.41	NM	
		35	14.57	305	7.59	910	15.55	4.65	0.36	NM	
		40	14.58	305	7.60	910	15.65	11.45	0.39	NM	
		45	14.58	305	7.60	910	15.54	11.67	0.38	NM	
		50	14.58	305	7.61	912	15.66	11.83	0.39	NM	
		55	14.59	305	7.63	911	15.67	12.03	0.39	NM	
MW-ZN-01S(L)	5/26/2006	5	14.65	310	6.92	847	14.71	3.01	0.46	-81.0	Peristaltic
		10	14.65	310	6.98	843	14.64	1.67	0.42	-85.1	
		15	14.65	310	7.00	841	14.62	0.36	0.43	-88.1	
MW-ZN-01S(L)	6/28/2006	5	14.57	310	7.46	1550	15.94	48.0	0.59	NM	Peristaltic
		10	14.58	310	7.45	1490	15.90	32.1	0.49	NM	
		15	14.57	310	7.48	1239	15.67	16.1	0.41	NM	
		20	14.58	310	7.53	1152	15.57	9.90	0.39	NM	
		25	14.57	310	7.54	1096	15.76	8.00	0.35	NM	
		30	14.56	310	7.54	1065	15.81	5.61	0.33	NM	
		35	14.56	310	7.54	1036	15.64	4.63	0.33	NM	
		40	14.57	310	7.54	1032	15.7	4.52	0.31	NM	
		45	14.56	310	7.54	1030	15.75	2.31	0.31	NM	
		50	14.56	310	7.55	1028	15.76	1.78	0.30	NM	
		55	14.56	310	7.54	1028	15.89	1.71	0.30	NM	

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
MW-ZN-02S(U)	5/26/2006	5	13.89	250	7.36	585	10.43	NM	7.3	264.5	Peristaltic
		10	13.89	250	7.40	582	10.55	NM	5.6	223.4	
		15	13.89	250	7.10	583	10.87	NM	0.54	240.9	
		20	13.89	250	6.68	585	10.96	5.43	0.45	369.8	
		25	13.89	250	6.39	587	10.99	NM	0.43	437.8	
		30	13.89	250	6.21	585	10.92	NM	0.42	477.7	
		35	13.89	250	6.36	583	10.93	NM	0.39	491.1	
		40	13.89	250	5.89	585	11.12	5.52	0.4	537.1	
		45	13.89	250	5.82	585	11.11	5.28	0.4	541.3	
		50	13.89	250	5.72	585	11.05	6.03	0.39	545.4	
MW-ZN-02S(L)	5/26/2006	5	13.61	220	6.57	596	11.24	NM	0.78	400.1	Peristaltic
		10	13.61	220	6.51	598	11.42	NM	0.74	402.2	
		15	13.61	220	6.27	600	11.51	NM	0.71	427.1	
		20	13.61	220	5.95	601	11.60	4.99	0.67	461.7	
		25	13.61	220	5.84	601	11.63	7.73	0.65	484.5	
		30	13.61	220	6.47	597	11.39	0.00	0.59	467.5	
		35	13.61	220	6.69	594	11.23	2.19	0.57	439.7	
		40	13.61	220	6.69	599	11.33	0.00	0.57	412.6	
		45	13.61	220	6.67	599	11.32	0.00	0.56	413.0	

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
MW-ZN-03S(U)	5/25/2006	5	13.55	280	6.94	740	10.56	28.1	5.91	222.9	Peristaltic
		10	13.55	280	6.34	749	10.37	0.20	1.99	400.6	
		15	13.55	280	6.10	745	10.50	0.26	2.18	467.4	
		20	13.55	280	5.96	741	10.39	0.0	1.99	506.1	
		25	13.55	280	5.83	738	10.45	0.78	1.85	579.3	
		30	13.55	280	5.79	738	10.47	1.24	1.87	527.4	
		35	13.55	280	5.74	738	10.55	1.51	1.86	536.0	
		40	13.55	280	5.72	740	10.61	1.93	1.81	540.2	
		45	13.55	290	5.46	744	10.57	1.50	0.55	571.4	
		50	13.55	290	5.58	741	10.48	1.17	0.48	569.4	
		55	13.55	290	5.51	738	10.48	1.62	0.48	571.7	
MW-ZN-03S(L)	5/25/2006	5	13.45	370	5.77	733	10.72	349	0.37	613.7	Peristaltic
		10	13.45	370	5.75	737	10.72	321	0.37	617.7	
		15	13.45	370	5.93	730	10.55	250	0.36	610.2	
		20	13.45	370	5.67	750	10.63	50.6	0.37	630.7	
		25	13.45	370	5.89	759	10.71	26.7	0.35	621.6	
		30	13.45	370	5.79	762	10.56	11.1	0.33	632.8	
		35	13.45	370	5.82	766	10.75	7.42	0.33	631.2	
		40	13.45	370	5.73	769	10.64	7.99	0.33	636.8	
		45	13.45	370	5.79	764	10.60	7.88	0.32	635.9	
		50	13.45	370	5.80	766	10.55	8.07	0.31	636.0	
		MW-ZN-04S(U)	5/24/2006	5	NM	NM	6.60	812	12.9	40.60	
10	NM			NM	7.04	689	13.0	29.60	NM	NM	
15	NM			NM	7.15	670	12.9	23.60	NM	NM	
20	NM			NM	7.20	643	13.1	21.30	NM	NM	
25	NM			NM	7.26	642	13.0	21.5	NM	NM	
30	NM			NM	7.27	640	12.8	19.3	NM	NM	

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
MW-ZN-04S(L)	5/24/2006	5	NM	NM	7.14	769	14.5	> 1000	NM	NM	
		10	NM	NM	7.11	774	14.2	> 1000	NM	NM	
		15	NM	NM	7.10	789	13.6	> 1000	NM	NM	
		20	NM	NM	7.13	785	13.8	> 1000	NM	NM	
		25	NM	NM	7.16	781	13.8	> 1000	NM	NM	
		30	NM	NM	7.17	787	13.4	> 1000	NM	NM	
		35	NM	NM	7.14	774	13.0	979	NM	NM	
		40	NM	NM	7.13	780	12.8	980	NM	NM	
MW-ZN-05S(L)	5/26/2006	5	NM	175	9.08	902	12.99	900	4.21	41.2	Peristaltic
		10	NM	175	9.38	902	13.07	750	1.36	39.1	
		15	NM	175	9.75	903	13.15	650	1.01	35.0	
		20	NM	175	9.97	902	13.09	500	0.84	31.9	
		25	NM	175	10.11	899	13.23	400	0.75	28.3	
		30	NM	175	10.22	899	13.47	350	0.72	26.3	
		35	NM	175	10.35	899	13.67	280	0.66	22.2	
		40	NM	175	10.39	898	13.68	240	0.70	19.1	
		45	NM	175	10.37	897	13.83	190	0.62	16.9	
		50	NM	175	10.35	896	13.77	170	0.61	15.2	
		55	NM	175	10.34	894	13.54	140	0.58	13.3	
		60	NM	175	10.34	893	13.36	130	0.56	11.2	
		65	NM	175	10.31	893	13.78	110	0.54	10.6	
		70	NM	175	10.33	894	13.91	90	0.53	3.0	
		75	NM	175	10.33	892	13.66	75	0.53	3.4	
		80	NM	175	10.26	893	13.82	70	0.51	4.5	
		85	NM	175	10.27	892	13.53	60	0.50	0.1	
		90	NM	175	10.16	890	13.92	55	0.74	1.7	
95	NM	175	10.15	893	14.03	55	0.62	1.6			
100	NM	175	10.15	893	14.13	45	0.56	2.6			
105	NM	175	10.18	893	14.13	40	0.54	3.1			
110	NM	175	10.20	893	14.15	36	0.53	4.4			
115	NM	175	10.23	895	14.11	36	0.53	6.3			

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMETERS
 FLEETWIDE ASSESSMENT
 ZION STATION
 ZION, ILLINOIS

Sample Location ¹	Date	Minutes Purged	Water Level	Flow Rate (mL/min)	pH (Std. Units)	Conductivity (µS/cm) ²	Temperature (°C)	Turbidity (ntu) ³	DO (mg/L)	ORP	Pump Type
MW-ZN-05S(U)	5/26/2006	15	NM	175	9.40	924	12.71	32	1.34	81.6	Peristaltic
		20	NM	175	9.49	906	12.83	140	1.0	67.5	
		25	NM	175	9.53	901	13.23	250	0.85	52.6	
		30	NM	175	9.58	897	13.44	230	0.76	42.9	
		35	NM	175	9.63	896	13.58	190	0.70	28.7	
		40	NM	175	9.66	901	13.45	170	0.68	23.6	
		45	NM	175	9.69	901	13.61	130	0.63	17.1	
		50	NM	175	9.72	901	13.49	120	0.62	9.4	
		55	NM	175	9.75	900	13.78	85	0.56	8.0	
		60	NM	175	9.86	900	13.29	65	0.53	1.8	
		65	NM	175	9.84	901	13.22	60	NA	NA	
		70	NM	175	9.90	899	13.09	55	0.81	3.0	
		75	NM	175	9.95	898	13.24	55	0.60	1.2	
		80	NM	175	10.00	897	13.16	45	0.56	-4.3	
		85	NM	175	10.06	896	13.13	45	0.52	-6.8	
		90	NM	175	10.04	896	13.15	39	0.51	-10.8	
95	NM	175	10.23	897	13.22	40	0.50	-12.7			
100	NM	175	10.37	899	13.18	30	0.51	-12.6			
105	NM	175	10.42	894	13.33	30	0.49	-14.9			
MW-ZN-06S(L)	5/25/2006	5	NM	175	7.11	1073	12.51	180	2.20	99.6	Peristaltic
		10	NM	175	6.95	955	12.04	130	1.42	105.3	
		15	NM	175	6.61	876	11.82	90	1.25	114.8	
		20	NM	175	6.46	864	11.75	13	1.03	105.8	
		25	NM	175	6.44	869	11.84	180	0.94	96.8	
		30	NM	175	6.16	871	11.92	130	0.84	91.6	
		35	NM	175	6.24	870	11.76	90	0.79	82.9	
		40	NM	175	6.05	867	11.56	39	0.76	82.9	
		45	NM	175	6.04	865	11.67	7.4	0.73	78.5	
		50	NM	175	5.98	868	11.83	22	0.70	69.5	
		55	NM	175	5.83	868	11.86	29	0.73	66.6	
		60	NM	175	6.08	868	11.90	21	0.69	59.5	

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMATERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS

Sample Location ¹	Date	Minutes Purged	Water Level	Flow Rate (mL/min)	pH (Std. Units)	Conductivity (µS/cm) ²	Temperature (°C)	Turbidity (ntu) ³	DO (mg/L)	ORP	Pump Type
MW-ZN-06S(U)	5/25/2006	5	NM	200	9.12	839	11.42	NA	1.62	84.1	Peristaltic
		10	NM	200	9.19	835	11.13	NA	1.14	81.2	
		15	NM	200	9.15	837	11.15	NA	1.17	78.4	
		20	NM	200	9.24	836	11.20	1100	0.97	67.9	
		25	NM	200	9.25	835	11.32	850	0.86	54.3	
		30	NM	200	9.30	836	11.33	650	0.80	41.6	
		35	NM	200	9.34	835	11.23	600	0.75	35.6	
		40	NM	200	9.36	833	11.15	550	1.12	30.3	
		45	NM	200	9.50	831	11.25	550	0.84	26.8	
		50	NM	200	9.41	831	10.99	450	0.76	25.4	
		55	NM	200	9.38	828	11.04	450	0.72	24.1	
		60	NM	200	9.38	828	11.06	450	0.68	22.9	
		65	NM	200	9.41	827	10.97	390	0.67	22.4	
		70	NM	200	9.53	823	11.09	340	0.63	21.1	
		75	NM	200	9.66	822	11.02	300	0.61	17.6	
		80	NM	200	9.52	823	11.09	240	0.61	15.7	
		85	NM	200	9.39	821	11.13	170	0.59	15.8	
90	NM	200	9.38	819	11.20	160	0.56	14.5			
95	NM	200	9.08	820	11.02	140	0.60	16.2			
100	NM	200	9.39	820	10.82	110	0.71	15.3			
105	NM	200	9.42	819	10.87	95	0.65	16.4			
110	NM	200	9.44	818	10.93	95	0.61	17.1			
115	NM	200	9.47	820	10.69	90	0.58	18.1			
MW-ZN-06S(U)	5/26/2006	5	NM	175	8.47	816	10.05	40	2.79	123.5	Peristaltic
		10	NM	175	8.58	814	9.71	26	1.99	121.4	
		15	NM	175	8.58	816	9.73	28	1.56	125.9	
		20	NM	175	8.51	820	9.66	27	1.26	131.1	
		25	NM	175	8.53	820	9.78	65	1.11	127.4	
		30	NM	175	8.58	818	10.04	140	1.02	120.2	
		35	NM	175	8.64	817	9.94	200	0.93	118.3	
		40	NM	175	8.66	818	9.93	190	0.93	117.5	
		45	NM	175	8.68	818	10.00	180	0.91	116.5	
		50	NM	175	8.67	817	10.03	190	0.86	116.2	
		55	NM	175	8.68	818	10.10	170	0.86	115.2	
		60	NM	175	8.63	818	10.15	150	0.97	114.1	

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
MW-ZN-07S(U)	5/24/2006	5	NM	200	8.37	872.0	10.40	95	3.18	144.0	Peristaltic
		10	NM	200	8.74	871.0	9.96	85	1.49	130.4	
		15	NM	200	8.78	873.0	9.79	60	1.22	129.6	
		20	NM	200	8.81	876.0	9.74	70	1.10	129.0	
		25	NM	200	8.80	880.0	9.64	110	1.04	128.2	
		30	NM	200	8.79	874.0	9.78	210	0.91	124.7	
		35	NM	200	8.85	873.0	10.17	200	0.93	121.4	
		40	NM	200	9.00	875.0	10.72	200	0.78	106.8	
MW-ZN-07S(L)	5/25/2006	5	NM	200	7.58	878	11.34	550	1.48	149.5	Peristaltic
		10	NM	200	7.67	878	11.35	700	1.18	130.6	
		15	NM	200	8.05	879	11.40	750	1.02	121.8	
		20	NM	200	8.45	881	11.79	650	0.96	109.5	
		25	NM	200	8.60	881	11.93	650	0.88	104.1	
		30	NM	200	8.70	888	11.90	250	0.84	102.4	
		35	NM	200	8.77	900	11.89	130	0.79	98.2	
		40	NM	200	8.79	905	11.85	85	0.75	96.8	
		45	NM	200	8.84	908	11.91	55	0.74	95.3	
		50	NM	200	9.11	907	12.16	50	0.70	84.4	
		55	NM	200	8.65	907	12.05	50	2.42	78.0	
		60	NM	200	9.36	906	11.95	40	1.07	69.7	
		65	NM	200	9.49	906	11.86	36	0.84	66.1	
		70	NM	200	9.56	907	12.27	40	0.72	61.0	
75	NM	200	9.67	910	12.21	35	0.70	55.8			
MW-ZN-08S(L)	5/24/2006	5	NM	250	7.23	771	11.55	4.8	2.84	244.9	Peristaltic
		10	NM	250	7.50	773	11.15	5.1	1.57	238.2	
		15	NM	250	7.55	771	11.13	3.0	1.42	247.8	
		20	NM	250	7.61	771	11.16	2.9	1.24	242.1	
		25	NM	250	7.64	774	11.29	2.3	1.20	227.9	
		30	NM	250	7.69	775	11.38	1.8	1.06	222.9	
		35	NM	250	7.76	775	11.55	1.6	0.96	225.7	
		40	NM	250	7.81	777	11.63	1.1	0.91	220.9	
		45	NM	250	7.80	778	11.70	1.4	0.86	225.4	

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
MW-ZN-08S(U)	5/24/2006	5	NM	250	7.83	737	11.65	6.6	2.17	218.7	Peristaltic
		10	NM	250	7.49	744	11.60	4.1	1.40	221.0	
		15	NM	250	7.88	755	11.38	3.3	1.12	214.2	
		20	NM	250	8.05	759	11.67	3.0	0.90	214.1	
		25	NM	250	8.02	762	12.06	2.4	0.82	217.5	
		30	NM	250	8.16	774	11.92	2.9	0.75	208.4	
		35	NM	250	8.07	775	11.84	2.7	0.71	213.6	
MW-ZN-09S	5/26/2006	5	10.73	350	8.23	358	12.32	0.80	2.21	366.6	Peristaltic
		10	10.73	350	8.35	357	12.34	0.56	0.03	388.3	
		15	10.73	350	8.36	357	12.36	0.52	0.00	393.1	
		20	10.73	350	8.35	358	12.34	0.54	0.00	398.7	
MW-ZN-10U	7/28/2006	5	13.72	200	7.22	0.577	13.10	10.50	1.68	-73.9	
		10	13.72	200	7.16	0.555	12.85	4.04	0.95	-78.5	
		15	13.72	200	7.16	0.543	12.76	7.11	0.94	-77.1	
		20	13.72	200	7.17	0.544	12.81	13.30	0.86	-84.4	
		25	13.72	200	7.18	0.550	12.91	17.00	0.79	-85.9	
		30	13.72	200	7.20	0.553	13.07	13.10	0.83	-82.5	
		35	13.72	200	7.23	0.553	13.08	11.10	0.84	-85.5	
		40	13.72	200	7.26	0.548	12.93	11.50	1.21	-88.8	
		45	13.72	200	7.28	0.549	12.95	7.55	0.66	-92.7	
		50	13.72	200	7.29	0.546	13.01	7.04	0.46	-94.1	
		55	13.72	200	7.29	0.548	13.15	6.44	0.43	-93.2	
		60	13.72	200	7.29	0.551	13.21	6.34	0.45	-94.9	
		65	13.72	200	7.30	0.551	13.18	4.34	0.48	-96.1	
		70	13.72	200	7.29	0.551	13.19	4.12	0.47	-96	

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMETERS
 FLEETWIDE ASSESSMENT
 ZION STATION
 ZION, ILLINOIS

Sample Location ¹	Date	Minutes Purged	Water Level	Flow Rate (mL/min)	pH (Std. Units)	Conductivity (µS/cm) ²	Temperature (°C)	Turbidity (ntu) ³	DO (mg/L)	ORP	Pump Type
MW-ZN-10L	7/28/2006	5	13.72	200	7.51	0.660	15.02	15.60	4.07	-112.2	
		10	13.72	200	7.36	0.617	14.39	7.56	1.91	-107.3	
		15	13.72	200	7.39	0.608	14.38	19.10	0.86	-103.5	
		20	13.72	200	7.36	0.607	14.55	17.90	0.67	-104.6	
		25	13.72	200	7.35	0.603	14.68	15.20	0.51	-101.6	
		30	13.72	200	7.33	0.600	14.76	15.50	0.45	-103.3	
		35	13.72	200	7.36	0.595	14.66	13.80	0.39	-103.9	
		40	13.72	200	7.35	0.594	14.70	13.10	0.38	-103.6	
		45	13.72	200	7.36	0.592	14.81	11.10	0.36	-103.9	
		50	13.72	200	7.38	0.590	14.78	11.00	0.34	-105.0	
		55	13.72	200	7.35	0.585	14.74	9.40	0.34	-103.1	
		60	13.72	200	7.35	0.583	14.74	9.33	0.31	-104.3	
		65	13.72	200	7.37	0.581	14.79	8.21	0.33	-104.9	
MW-ZN-11U	7/28/2006	15	10.65	250	8.02	NM	15.7	2.6	9.4	-29.8	
		20	10.65	250	7.86	NM	15.8	34.1	7.4	-30.5	
		25	10.65	250	7.80	NM	16.0	32.0	6.4	-39.80	
		30	10.65	250	7.71	NM	16.0	23.0	5.7	-35.7	
		35	10.65	250	7.66	NM	15.5	15.8	5.2	-38.7	
		40	10.65	250	7.63	NM	15.3	10.3	5.0	-40.1	
		45	10.65	250	7.60	NM	15.3	6.1	4.8	-43.1	
		50	10.65	250	7.58	NM	15.2	4.4	4.6	-43.1	
MW-ZN-11L	7/28/2006	20	10.65	250	7.78	NM	14.93	19.0	13.9	-1.6	
		25	10.65	250	7.84	NM	14.78	10.7	11.9	-3.4	
		30	10.65	250	7.87	NM	14.93	7.4	9.7	-10.9	
		35	10.65	250	7.85	NM	14.96	5.3	8.9	-12.8	
		40	10.65	250	7.80	NM	14.86	4.1	8.2	-23.4	
		45	10.65	250	7.75	NM	14.97	3.7	7.5	-27.8	
		50	10.65	250	7.72	NM	14.97	3.1	36.5	-36.8	
		55	10.65	250	7.67	NM	14.99	2.0	9.4	-37.0	
		60	10.65	250	7.65	NM	14.88	1.7	7.8	-41.2	
		65	10.65	250	7.61	NM	15.02	1.2	66.6	-43.9	
		70	10.65	250	7.60	NM	16.08	1.0	6.3	-44.7	
		75	10.65	250	7.59	NM	15.10	1.0	6.1	-46.1	

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ¹	<i>Date</i>	<i>Minutes Purged</i>	<i>Water Level</i>	<i>Flow Rate (mL/min)</i>	<i>pH (Std. Units)</i>	<i>Conductivity (µS/cm)</i> ²	<i>Temperature (°C)</i>	<i>Turbidity (ntu)</i> ³	<i>DO (mg/L)</i>	<i>ORP</i>	<i>Pump Type</i>
TW-ZN-100	7/17/2006	5	10.62		7.89	187.5	20.7	NM	NM	NM	
		10	10.62		7.69	163.7	20.3	NM	NM	NM	
		15	10.62		7.64	163.3	10.7	NM	NM	NM	
TW-ZN-101	7/17/2006	5	10.27		7.70	179.9	21.0	NM	NM	NM	
		10	10.27		7.68	179.8	20.8	NM	NM	NM	
		15	10.27		7.50	181.1	20.3	NM	NM	NM	
TW-ZN-102	7/17/2006	5	10.33		7.75	143.4	20.9	NM	NM	NM	
		10	10.33		7.85	135.9	20.6	NM	NM	NM	
		15	10.33		7.87	138.3	20.7	NM	NM	NM	
TW-ZN-103	7/17/2006	5	9.03		7.93	186.1	20.9	NM	NM	NM	
		10	9.03		7.73	182.5	20.2	NM	NM	NM	
		15	9.03		7.59	180.5	19.8	NM	NM	NM	

Notes:

¹ Sample locations include the well identifier followed by a sample depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

² µS/cm - microSiemens per centimeter

³ ntu - nephelometric turbidity units

NM = Not Measured

**ANALYTICAL RESULTS SUMMARY - TRITIUM IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location</i> ⁽¹⁾	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Sample Date</i>	<i>Tritium (pCi/L)</i>	<i>Result Error</i>
MW-ZN-01S(L)	WG-ZN-MW-ZN-01L-052606-DS-07		5/26/2006	586	+/-141
MW-ZN-01S(L)	GW-062806-PG-02		6/28/2006	ND (200)	-
MW-ZN-01S(U)	WG-ZN-MW-ZN-01U-052606-DS-05		5/26/2006	261	+/-124
MW-ZN-01S(U)	GW-062806-PG-01		6/28/2006	220	+/-123
MW-ZN-02S(L)	WG-ZN-MW-ZN-02L-052606-DS-06		5/26/2006	ND (200)	-
MW-ZN-02S(U)	WG-ZN-MW-ZN-02U-052606-DS-04		5/26/2006	ND (200)	-
MW-ZN-03S(L)	WG-ZN-MW-ZN-03L-052506-DS-03		5/25/2006	ND (200)	-
MW-ZN-03S(U)	WG-ZN-MW-ZN-03U-052506-DS-01		5/25/2006	ND (200)	-
MW-ZN-03S(U)	WG-ZN-MW-ZN-03U-052506-DS-02	Duplicate (01)	5/25/2006	ND (200)	-
MW-ZN-04S(L)	WG-ZION-MW-4L-052406-MB-004		5/24/2006	ND (200)	-
MW-ZN-04S(U)	WG-ZION-MW-4U-052406-MB-002		5/24/2006	ND (200)	-
MW-ZN-05S(L)	WG-ZION-MW-5L-052606-MS-013		5/26/2006	ND (200)	-
MW-ZN-05S(U)	WG-ZION-MW-5U-052606-MS-017		5/26/2006	ND (200)	-
MW-ZN-06S(L)	WG-ZION-MW-6L-052506-MS-009		5/25/2006	ND (200)	-
MW-ZN-06S(U)	WG-ZION-MW-6U-052606-MS-011		5/26/2006	ND (200)	-
MW-ZN-07S(L)	WG-ZION-MW-7L-052506-MS-007		5/25/2006	ND (200)	-
MW-ZN-07S(U)	WG-ZION-MW-7U-052406-MS-005		5/24/2006	ND (200)	-
MW-ZN-08S(L)	WG-ZION-MW-8L-052406-MS-001		5/24/2006	ND (200)	-
MW-ZN-08S(U)	WG-ZION-MW-8U-052406-MS-003		5/24/2006	ND (200)	-
MW-ZN-09S	WG-ZN-MW-ZN-09-052606-DS-08		5/26/2006	ND (200)	-
MW-ZN-09S	WG-ZN-MW-ZN-09-052606-DS-09	Duplicate (08)	5/26/2006	ND (200)	-
MW-ZN-10S(L)	WG-ZN-MW-ZN-10L-072806-MS-005		7/28/2006	ND (200)	-
MW-ZN-10S(U)	WG-ZN-MW-ZN-10U-072806-MS-003		7/28/2006	ND (200)	-
MW-ZN-10S(U)	WG-ZN-MW-ZN-10U-072806-MS-004		7/28/2006	ND (200)	-
MW-ZN-11S(L)	WG-ZN-MW-ZN-11L-072806-TL-002		7/28/2006	ND (200)	-
MW-ZN-11S(U)	WG-ZN-MW-ZN-11U-072806-TL-001		7/28/2006	ND (200)	-
SW-ZN-1	WS-ZION-LAKE-052606-MS-015		5/26/2006	ND (200)	-
TW-ZN-100	GW-071706-JL-TW-ZN-100		7/17/2006	ND (200)	-
TW-ZN-101	GW-071706-JL-TW-ZN-101		7/17/2006	ND (200)	-
TW-ZN-102	GW-071706-JL-TW-ZN-102		7/17/2006	ND (200)	-
TW-ZN-103	GW-071706-JL-TW-ZN-103		7/17/2006	ND (200)	-

Notes:

Samples analyzed by: Teledyne Brown Engineering, Inc.

(1) Sample locations include the well identifier followed by a sample depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

ND () - Not detected at a concentration above the LLD. Value in parentheses is the LLD.

LLD - Lower limit of detection.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:		MW-ZN-01S(L) WG-ZN-MW-ZN-01L-052606-DS-07 5/26/2006	MW-ZN-01S(L) Result Error	MW-ZN-01S(U) WG-ZN-MW-ZN-01U-052606-DS-05 5/26/2006	MW-ZN-01S(U) Result Error	MW-ZN-02S(L) WG-ZN-MW-ZN-02L-052606-DS-06 5/26/2006	MW-ZN-02S(L) Result Error
	Units						
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides ⁽²⁾							
Actinium-228	pCi/L	35.23	+/-10.3	RNI	-	RNI	-
Potassium-40	pCi/L	53.04	+/-34.2	RNI	-	81.03	+/-42.45

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Value in parentheses is the LLD.

LLD - Lower limit of detection.

U* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ :</i>		MW-ZN-02S(U)	MW-ZN-02S(U)	MW-ZN-03S(L)	MW-ZN-03S(L)	MW-ZN-03S(U)	MW-ZN-03S(U)
<i>Sample Identification:</i>		WG-ZN-MW-ZN-02U-052606-DS-04	Result	WG-ZN-MW-ZN-03L-052506-DS-03	Result	WG-ZN-MW-ZN-03U-052506-DS-01	Result
<i>Sample Date:</i>		5/26/2006	Error	5/25/2006	Error	5/25/2006	Error
	<i>Units</i>						
<i>Target Radionuclides</i>							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<i>Non-Target Radionuclides ⁽²⁾</i>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	73.65	+/-44.47	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown
 (1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.
 (2) - Radionuclide is naturally occurring.
 RNI- Radionuclide Not Identified during analysis.
 ND () - Not detected at a concentration above the LLD. Val
 LLD - Lower limit of detection.
 U* - Compound/ Analyte not detected.
 Peak not identified, but forced activity concentration exceeds Minimum Detectable Concentration and 3 sigma.
 -- Non-detect value, +/- value not reported.

TABLE 5.2

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS

Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:		MW-ZN-03S(U) WG-ZN-MW-ZN-03U-052506-DS-02 5/25/2006 Duplicate	MW-ZN-03S(U) Result Error	MW-ZN-04S(L) WG-ZION-MW-4L-052406-MB-004 5/24/2006	MW-ZN-04S(L) Result Error	MW-ZN-04S(U) WG-ZION-MW-4U-052406-MB-002 5/24/2006	MW-ZN-04S(U) Result Error
	Units						
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30) U*	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides ⁽²⁾							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	85.89	+/-44.24	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ :</i>		MW-ZN-05S(L)	MW-ZN-05S(L)	MW-ZN-05S(U)	MW-ZN-05S(U)	MW-ZN-06S(L)	MW-ZN-06S(L)
<i>Sample Identification:</i>		WG-ZION-MW-5L-052606-MS-013	Result	WG-ZION-MW-5U-052606-MS-017	Result	WG-ZION-MW-6L-052506-MS-009	Result
<i>Sample Date:</i>		5/26/2006	Error	5/26/2006	Error	5/25/2006	Error
	<i>Units</i>						
<i>Target Radionuclides</i>							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10) U*	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30) U*	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<i>Non-Target Radionuclides ⁽²⁾</i>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U* - Compound/ Analyte not detected.

Peak not identified, but forced activity

concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:</i>		<i>MW-ZN-06S(U) WG-ZION-MW-6U-052606-MS-011 5/26/2006</i>	<i>MW-ZN-06S(U) Result Error</i>	<i>MW-ZN-07S(L) WG-ZION-MW-7L-052506-MS-007 5/25/2006</i>	<i>MW-ZN-07S(L) Result Error</i>	<i>MW-ZN-07S(U) WG-ZION-MW-7U-052406-MS-005 5/24/2006</i>	<i>MW-ZN-07S(U) Result Error</i>
	Units						
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10) U*	-	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30) U*	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides ⁽²⁾							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:</i>		<i>MW-ZN-08S(L) WG-ZION-MW-8L-052406-MS-001 5/24/2006</i>	<i>MW-ZN-08S(L) Result Error</i>	<i>MW-ZN-08S(U) WG-ZION-MW-8U-052406-MS-003 5/24/2006</i>	<i>MW-ZN-08S(U) Result Error</i>	<i>MW-ZN-09S WG-ZN-MW-ZN-09-052606-DS-08 5/26/2006</i>	<i>MW-ZN-09S Result Error</i>
	Units						
Target Radionuclides							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Non-Target Radionuclides ⁽²⁾							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	69.37	+/-45.71	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:</i>		<i>MW-ZN-09S WG-ZN-MW-ZN-09-052606-DS-09 5/26/2006 Duplicate</i>	<i>MW-ZN-09S Result Error</i>	<i>MW-ZN-10S(L) WG-ZN-MW-ZN-10L-072806-MS-005 7/28/2006</i>	<i>MW-ZN-10S(L) Result Error</i>	<i>MW-ZN-10S(U) WG-ZN-MW-ZN-10U-072806-MS-003 7/28/2006</i>	<i>MW-ZN-10S(U) Result Error</i>
	<i>Units</i>						
<i>Target Radionuclides</i>							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<i>Non-Target Radionuclides ⁽²⁾</i>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	83.66	+/-42.25

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ :</i>		<i>MW-ZN-10S(U)</i>	<i>MW-ZN-10S(U)</i>	<i>MW-ZN-11S(L)</i>	<i>MW-ZN-11S(L)</i>	<i>MW-ZN-11S(U)</i>	<i>MW-ZN-11S(U)</i>
<i>Sample Identification:</i>		<i>WG-ZN-MW-ZN-10U-072806-MS-004</i>	<i>Result</i>	<i>WG-ZN-MW-ZN-11L-072806-TL-002</i>	<i>Result</i>	<i>WG-ZN-MW-ZN-11U-072806-TL-001</i>	<i>Result</i>
<i>Sample Date:</i>		<i>7/28/2006</i>	<i>Error</i>	<i>7/28/2006</i>	<i>Error</i>	<i>7/28/2006</i>	<i>Error</i>
	<i>Units</i>						
<i>Target Radionuclides</i>							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10) U*	-	ND (10) U*	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30) U*	-	ND (30) U*	-	ND (30) U*	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<i>Non-Target Radionuclides ⁽²⁾</i>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND () - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:</i>		SW-ZN-1 WS-ZION-LAKE-052606-MS-015 5/26/2006	SW-ZN-1 Result Error	TW-ZN-100 GW-071706-JL-TW-ZN-100 7/17/2006	TW-ZN-100 Result Error	TW-ZN-101 GW-071706-JL-TW-ZN-101 7/17/2006	TW-ZN-101 Result Error	TW-ZN-101 GW-071706-JL-TW-ZN-101 7/17/2006 <i>Re-run</i>	TW-ZN-101 Result Error	
	<i>Units</i>									
<i>Target Radionuclides</i>										
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-	ND (60)	-	
Cesium-134	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-	ND (10) U*	-	
Cesium-137	pCi/L	ND (18)	-	ND (18)	-	ND (18)	-	ND (18)	-	
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-	ND (15)	-	
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-	ND (15)	-	
Iron-59	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-	ND (30)	-	
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-	ND (15)	-	
Manganese-54	pCi/L	ND (15)	-	ND (15)	-	ND (15)	-	ND (15)	-	
Niobium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-	ND (10)	-	
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-	-	-	
Zinc-65	pCi/L	ND (30)	-	ND (30)	-	ND (30)	-	ND (30) U*	-	
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-	ND (10)	-	
<i>Non-Target Radionuclides ⁽²⁾</i>										
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-	RNI	-	
Potassium-40	pCi/L	106.8	+/-48.41	RNI	--	RNI	-	RNI	-	

Notes:

Samples analyzed by: Teledyne Brown
 (1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.
 (2) - Radionuclide is naturally occurring.
 RNI- Radionuclide Not Identified during analysis.
 ND () - Not detected at a concentration above the LLD. Val
 LLD - Lower limit of detection.
 U* - Compound/ Analyte not detected.
 Peak not identified, but forced activity concentration exceeds Minimum Detectable Concentration and 3 sigma.
 -- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS**

<i>Sample Location ⁽¹⁾ ; Sample Identification: Sample Date:</i>		<i>TW-ZN-102 GW-071706-JL-TW-ZN-102 7/17/2006</i>	<i>TW-ZN-102 Result Error</i>	<i>TW-ZN-103 GW-071706-JL-TW-ZN-103 7/17/2006</i>	<i>TW-ZN-103 Result Error</i>
	Units				
Target Radionuclides					
Barium-140	pCi/L	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10)	-	ND (10)	-
Cesium-137	pCi/L	ND (18)	-	ND (18)	-
Cobalt-58	pCi/L	ND (15)	-	ND (15)	-
Cobalt-60	pCi/L	ND (15)	-	ND (15)	-
Iron-59	pCi/L	ND (30)	-	ND (30)	-
Lanthanum-140	pCi/L	ND (15)	-	ND (15)	-
Manganese-54	pCi/L	ND (15)	-	ND (15)	-
Niobium-95	pCi/L	ND (10)	-	ND (10)	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-
Non-Target Radionuclides ⁽²⁾					
Actinium-228	pCi/L	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown
 (1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.
 (2) - Radionuclide is naturally occurring.
 RNI- Radionuclide Not Identified during analysis.
 ND () - Not detected at a concentration above the LLD. Val
 LLD - Lower limit of detection.
 U* - Compound/ Analyte not detected.
 Peak not identified, but forced activity concentration exceeds Minimum Detectable Concentration and 3 sigma.
 -- Non-detect value, +/- value not reported.

APPENDIX A

WATER WELL INVENTORY RECORDS

- A.1 BANKS 2006 WATER WELL REPORT
- A.2 ISWS LOGS

A.1 BANKS 2006 WATER WELL REPORT



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June 7, 2006

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Chicago, IL 60631**

SITE

**Zion Generating Station
Zion, IL
Lake County
060706-001**

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DETAILS

State ID	1209702313	MAP ID
Banks ID	1709700030	1
Owner Of Well	J. Sekowski	
Type Of Well	N/A	
Depth Drilled	62 '	
Completion Date	1/1/1950	
Longitude	-87.83276	
Latitude	42.45169	

State ID	1209702312	MAP ID
Banks ID	1709700033	2
Owner Of Well	W.T. Loblow	
Type Of Well	N/A	
Depth Drilled	200 '	
Completion Date	N/A	
Longitude	-87.83159	
Latitude	42.44537	

State ID	1209702317	MAP ID
Banks ID	1709700031	3
Owner Of Well	J. Sekowski	
Type Of Well	N/A	
Depth Drilled	82 '	
Completion Date	1/1/1952	
Longitude	-87.83524	
Latitude	42.4499	

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DETAILS

State ID	1209702314	MAP ID
Banks ID	1709700034	3
Owner Of Well	Shiloh Park	
Type Of Well	N/A	
Depth Drilled	1569 '	
Completion Date	N/A	
Longitude	-87.83524	
Latitude	42.4499	

State ID	1209702316	MAP ID
Banks ID	1709700032	4
Owner Of Well	Zion City Well	
Type Of Well	N/A	
Depth Drilled	1025 '	
Completion Date	N/A	
Longitude	-87.82679	
Latitude	42.44535	

State ID	1209702051	MAP ID
Banks ID	1709700036	4
Owner Of Well	Heat Plant	
Type Of Well	N/A	
Depth Drilled	175 '	
Completion Date	N/A	
Longitude	-87.82679	
Latitude	42.44535	

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DETAILS

State ID	1209737424	MAP ID
Banks ID	1709700039	5
Owner Of Well	Tom C. Hanson	
Type Of Well	N/A	
Depth Drilled	180 '	
Completion Date	N/A	
Longitude	-87.80674	
Latitude	42.45072	

State ID	1209726844	MAP ID
Banks ID	1709700040	6
Owner Of Well	City of Zion	
Type Of Well	N/A	
Depth Drilled	15 '	
Completion Date	11/1/1972	
Longitude	-87.81565	
Latitude	42.44982	

State ID	1209702319	MAP ID
Banks ID	1709700041	7
Owner Of Well	F.H. Ferguson	
Type Of Well	N/A	
Depth Drilled	154 '	
Completion Date	N/A	
Longitude	-87.82311	
Latitude	42.44623	

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DETAILS

State ID	1209702320	MAP ID
Banks ID	1709700042	8
Owner Of Well	Hotel Zion Home	
Type Of Well	N/A	
Depth Drilled	225 '	
Completion Date	N/A	
Longitude	-87.8231	
Latitude	42.44804	

State ID	1209702926	MAP ID
Banks ID	1709700043	9
Owner Of Well	Alvin Justin	
Type Of Well	N/A	
Depth Drilled	120 '	
Completion Date	8/7/1969	
Longitude	-87.80287	
Latitude	42.45683	

State ID	1209703060	MAP ID
Banks ID	1709700044	9
Owner Of Well	Harry G. Spencer	
Type Of Well	N/A	
Depth Drilled	142 '	
Completion Date	11/20/1970	
Longitude	-87.80156	
Latitude	42.45683	

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DETAILS

State ID	1209702322	MAP ID
Banks ID	1709700045	10
Owner Of Well	Zion Estates	
Type Of Well	N/A	
Depth Drilled	138 '	
Completion Date	N/A	
Longitude	-87.80146	
Latitude	42.44612	

State ID	1209702292	MAP ID
Banks ID	1709700065	11
Owner Of Well	Clude Koontr	
Type Of Well	N/A	
Depth Drilled	266 '	
Completion Date	9/1/1940	
Longitude	-87.83029	
Latitude	42.46073	

State ID	1209725154	MAP ID
Banks ID	1709700070	12
Owner Of Well	Busch & Larson	
Type Of Well	N/A	
Depth Drilled	219 '	
Completion Date	1/1/1976	
Longitude	-87.82809	
Latitude	42.46127	

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DETAILS

State ID	1209725155	MAP ID
Banks ID	1709700071	12
Owner Of Well	Busch & Larson	
Type Of Well	N/A	
Depth Drilled	195 '	
Completion Date	1/24/1977	
Longitude	-87.82865	
Latitude	42.46128	

State ID	1209733751	MAP ID
Banks ID	1709700088	12
Owner Of Well	Don Falstad	
Type Of Well	N/A	
Depth Drilled	160 '	
Completion Date	9/30/1977	
Longitude	-87.8285	
Latitude	42.46182	

State ID	1209703280	MAP ID
Banks ID	1709700075	13
Owner Of Well	Paul Richardson	
Type Of Well	N/A	
Depth Drilled	322 '	
Completion Date	7/1/1971	
Longitude	-87.82885	
Latitude	42.45895	

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DETAILS

State ID	1209702617	MAP ID
Banks ID	1709700066	14
Owner Of Well	C. Edwards	
Type Of Well	N/A	
Depth Drilled	146 '	
Completion Date	1/1/1963	
Longitude	-87.82662	
Latitude	42.46526	

State ID	1209702618	MAP ID
Banks ID	1709700067	14
Owner Of Well	C. Edwards	
Type Of Well	N/A	
Depth Drilled	160 '	
Completion Date	1/1/1963	
Longitude	-87.82662	
Latitude	42.46526	

State ID	1209702619	MAP ID
Banks ID	1709700068	14
Owner Of Well	H. Jorgenson	
Type Of Well	N/A	
Depth Drilled	137 '	
Completion Date	1/1/1963	
Longitude	-87.82666	
Latitude	42.46526	

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DETAILS

State ID	1209702798	MAP ID
Banks ID	1709700069	14
Owner Of Well	A.R. Casteel	
Type Of Well	N/A	
Depth Drilled	315 '	
Completion Date	5/1/1968	
Longitude	-87.82527	
Latitude	42.46472	

State ID	1209703883	MAP ID
Banks ID	1709700074	14
Owner Of Well	O'Neal Humphries	
Type Of Well	N/A	
Depth Drilled	127 '	
Completion Date	10/27/1972	
Longitude	-87.82666	
Latitude	42.46526	

State ID	1209703399	MAP ID
Banks ID	1709700076	14
Owner Of Well	Jerry Moyer	
Type Of Well	N/A	
Depth Drilled	242 '	
Completion Date	10/1/1971	
Longitude	-87.8256	
Latitude	42.46414	

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DETAILS

State ID	1209724153	MAP ID
Banks ID	1709700077	15
Owner Of Well	Si Henarichs Agency	
Type Of Well	N/A	
Depth Drilled	138 '	
Completion Date	11/12/1973	
Longitude	-87.82705	
Latitude	42.4684	

State ID	1209726697	MAP ID
Banks ID	1709700080	16
Owner Of Well	Bruce Griffith	
Type Of Well	N/A	
Depth Drilled	145 '	
Completion Date	9/21/1978	
Longitude	-87.82715	
Latitude	42.46295	

State ID	1209726818	MAP ID
Banks ID	1709700081	17
Owner Of Well	Clayton Watts	
Type Of Well	N/A	
Depth Drilled	274 '	
Completion Date	12/1/1977	
Longitude	-87.82908	
Latitude	42.46408	

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DETAILS

State ID	1209725157	MAP ID
Banks ID	1709700073	18
Owner Of Well	Howard Freemark	
Type Of Well	N/A	
Depth Drilled	190 '	
Completion Date	12/1/1976	
Longitude	-87.82668	
Latitude	42.46256	

State ID	1209727962	MAP ID
Banks ID	1709700084	18
Owner Of Well	William Blagg, Jr.	
Type Of Well	N/A	
Depth Drilled	168 '	
Completion Date	2/14/1986	
Longitude	-87.82664	
Latitude	42.46163	

State ID	1209733750	MAP ID
Banks ID	1709700087	19
Owner Of Well	Veterans Administration 265	
Type Of Well	N/A	
Depth Drilled	150 '	
Completion Date	12/8/1983	
Longitude	-87.82514	
Latitude	42.46636	

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DETAILS

State ID	1209702287	MAP ID
Banks ID	1709700090	20
Owner Of Well	William Nacker	
Type Of Well	N/A	
Depth Drilled	119 '	
Completion Date	1/1/1940	
Longitude	-87.82231	
Latitude	42.46317	

State ID	1209727833	MAP ID
Banks ID	1709700108	20
Owner Of Well	Tim Hough	
Type Of Well	N/A	
Depth Drilled	55 '	
Completion Date	11/30/1985	
Longitude	-87.82114	
Latitude	42.46289	

State ID	1209702288	MAP ID
Banks ID	1709700091	21
Owner Of Well	Camp Logan	
Type Of Well	N/A	
Depth Drilled	110 '	
Completion Date	1/1/1941	
Longitude	-87.80954	
Latitude	42.46519	

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DETAILS

State ID	1209702615	MAP ID
Banks ID	1709700094	22
Owner Of Well	Homer McNabb	
Type Of Well	N/A	
Depth Drilled	66 '	
Completion Date	1/1/1963	
Longitude	-87.82425	
Latitude	42.46162	

State ID	1209702796	MAP ID
Banks ID	1709700096	23
Owner Of Well	William Walters	
Type Of Well	N/A	
Depth Drilled	160 '	
Completion Date	8/11/1968	
Longitude	-87.81839	
Latitude	42.46853	

State ID	1209702797	MAP ID
Banks ID	1709700097	24
Owner Of Well	Jim Middleton	
Type Of Well	N/A	
Depth Drilled	80 '	
Completion Date	4/5/1968	
Longitude	-87.81566	
Latitude	42.46434	

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DETAILS

State ID	1209725066	MAP ID
Banks ID	1709700098	25
Owner Of Well	Craig Anderson	
Type Of Well	N/A	
Depth Drilled	127 '	
Completion Date	11/18/1976	
Longitude	-87.8169	
Latitude	42.46845	

State ID	1209702614	MAP ID
Banks ID	1709700093	26
Owner Of Well	James Fout	
Type Of Well	N/A	
Depth Drilled	130 '	
Completion Date	1/1/1963	
Longitude	-87.81682	
Latitude	42.47065	

State ID	1209703882	MAP ID
Banks ID	1709700101	26
Owner Of Well	Pitcher Construction Co.	
Type Of Well	N/A	
Depth Drilled	138 '	
Completion Date	4/3/1973	
Longitude	-87.81686	
Latitude	42.47065	

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DETAILS

State ID	1209703416	MAP ID
Banks ID	1709700104	26
Owner Of Well	Billy Holland	
Type Of Well	N/A	
Depth Drilled	141 '	
Completion Date	11/1/1971	
Longitude	-87.81811	
Latitude	42.46991	

State ID	1209724152	MAP ID
Banks ID	1709700105	27
Owner Of Well	Sihendrick Agency	
Type Of Well	N/A	
Depth Drilled	266 '	
Completion Date	1/1/1974	
Longitude	-87.82027	
Latitude	42.4628	

State ID	1209702616	MAP ID
Banks ID	1709700095	28
Owner Of Well	Harold McNabb	
Type Of Well	N/A	
Depth Drilled	177 '	
Completion Date	1/1/1963	
Longitude	-87.81929	
Latitude	42.46341	

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DETAILS

State ID	1209703881	MAP ID
Banks ID	1709700100	28
Owner Of Well	Ray Neal	
Type Of Well	N/A	
Depth Drilled	134 '	
Completion Date	6/2/1972	
Longitude	-87.81807	
Latitude	42.46249	

State ID	1209703921	MAP ID
Banks ID	1709700102	28
Owner Of Well	Steve Markabrad	
Type Of Well	N/A	
Depth Drilled	143 '	
Completion Date	5/1/1973	
Longitude	-87.8179	
Latitude	42.46237	

State ID	1209724846	MAP ID
Banks ID	1709700106	28
Owner Of Well	Busch & Larson	
Type Of Well	N/A	
Depth Drilled	199 '	
Completion Date	6/12/1976	
Longitude	-87.81931	
Latitude	42.46291	

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DETAILS

State ID	1209724252	MAP ID
Banks ID	1709700107	29
Owner Of Well	Albert Klemin	
Type Of Well	N/A	
Depth Drilled	167 '	
Completion Date	7/1/1974	
Longitude	-87.82197	
Latitude	42.45803	

State ID	1209729270	MAP ID
Banks ID	1709700109	30
Owner Of Well	Ron Conde	
Type Of Well	N/A	
Depth Drilled	46 '	
Completion Date	3/3/1987	
Longitude	-87.81524	
Latitude	42.46257	

State ID	1209728125	MAP ID
Banks ID	1709700110	31
Owner Of Well	Stacy Dickerson	
Type Of Well	N/A	
Depth Drilled	136 '	
Completion Date	5/15/1986	
Longitude	-87.81318	
Latitude	42.45892	

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DETAILS

State ID	1209703077	MAP ID
Banks ID	1709700092	32
Owner Of Well	C.N. Clark	
Type Of Well	N/A	
Depth Drilled	77 '	
Completion Date	1/1/1971	
Longitude	-87.81844	
Latitude	42.46637	

State ID	1209724431	MAP ID
Banks ID	1709700099	32
Owner Of Well	R. Conde	
Type Of Well	N/A	
Depth Drilled	61 '	
Completion Date	4/1/1975	
Longitude	-87.82049	
Latitude	42.46625	

State ID	1209703357	MAP ID
Banks ID	1709700103	32
Owner Of Well	Glen Martin	
Type Of Well	N/A	
Depth Drilled	147 '	
Completion Date	9/1/1971	
Longitude	-87.81933	
Latitude	42.46704	

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DETAILS

State ID	1209731926	MAP ID
Banks ID	1709700111	32
Owner Of Well	Ron Conde	
Type Of Well	N/A	
Depth Drilled	56'	
Completion Date	2/10/1989	
Longitude	-87.81932	
Latitude	42.46703	

State ID	1209733748	MAP ID
Banks ID	1709700113	32
Owner Of Well	Jim Fout	
Type Of Well	N/A	
Depth Drilled	49'	
Completion Date	5/24/1979	
Longitude	-87.81943	
Latitude	42.46661	

State ID	1209733747	MAP ID
Banks ID	1709700112	33
Owner Of Well	Mary Barclay	
Type Of Well	N/A	
Depth Drilled	89'	
Completion Date	4/2/1979	
Longitude	-87.82261	
Latitude	42.46762	

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DETAILS

State ID	1209733749	MAP ID
Banks ID	1709700114	34
Owner Of Well	Glen Martin	
Type Of Well	N/A	
Depth Drilled	116 '	
Completion Date	4/5/1977	
Longitude	-87.82049	
Latitude	42.46935	

State ID	1209702911	MAP ID
Banks ID	1709700115	35
Owner Of Well	Grace Sills	
Type Of Well	N/A	
Depth Drilled	123 '	
Completion Date	7/3/1969	
Longitude	-87.80023	
Latitude	42.46109	

State ID	1209702795	MAP ID
Banks ID	1709700117	35
Owner Of Well	William Jenko	
Type Of Well	N/A	
Depth Drilled	180 '	
Completion Date	11/15/1968	
Longitude	-87.80139	
Latitude	42.46192	

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DETAILS

State ID	1209702993	MAP ID
Banks ID	1709700116	36
Owner Of Well	Rudy Copen	
Type Of Well	N/A	
Depth Drilled	125 '	
Completion Date	11/21/1969	
Longitude	-87.80208	
Latitude	42.4589	

State ID	1209733746	MAP ID
Banks ID	1709700118	37
Owner Of Well	Progressive Builders	
Type Of Well	N/A	
Depth Drilled	104 '	
Completion Date	9/27/1979	
Longitude	-87.80505	
Latitude	42.46026	

State ID	1209702454	MAP ID
Banks ID	1709700123	38
Owner Of Well	E.C. Buese	
Type Of Well	N/A	
Depth Drilled	225 '	
Completion Date	2/1/1968	
Longitude	-87.83155	
Latitude	42.43991	

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DETAILS

State ID	1209702802	MAP ID
Banks ID	1709700128	39
Owner Of Well	James Barnes	
Type Of Well	N/A	
Depth Drilled	147 '	
Completion Date	11/1/1968	
Longitude	-87.8288	
Latitude	42.43442	

State ID	1209733862	MAP ID
Banks ID	1709700191	39
Owner Of Well	Don Miesner	
Type Of Well	N/A	
Depth Drilled	156 '	
Completion Date	10/5/1979	
Longitude	-87.82881	
Latitude	42.43518	

State ID	1209702803	MAP ID
Banks ID	1709700129	40
Owner Of Well	Mrs. Michael Lester	
Type Of Well	N/A	
Depth Drilled	146 '	
Completion Date	12/1/1968	
Longitude	-87.82673	
Latitude	42.43017	

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DETAILS

State ID	1209733861	MAP ID
Banks ID	1709700190	40
Owner Of Well	Jim Middleton	
Type Of Well	N/A	
Depth Drilled	195 '	
Completion Date	5/25/1979	
Longitude	-87.82585	
Latitude	42.42971	

State ID	1209735998	MAP ID
Banks ID	1709700209	40
Owner Of Well	J & E Builders	
Type Of Well	N/A	
Depth Drilled	160 '	
Completion Date	8/9/1990	
Longitude	-87.82687	
Latitude	42.43084	

State ID	1209736004	MAP ID
Banks ID	1709700215	40
Owner Of Well	Victor Smith	
Type Of Well	N/A	
Depth Drilled	163 '	
Completion Date	4/12/1989	
Longitude	-87.82687	
Latitude	42.43084	

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DETAILS

State ID	1209736295	MAP ID
Banks ID	1709700218	40
Owner Of Well	Vivian Edwards	
Type Of Well	N/A	
Depth Drilled	187 '	
Completion Date	7/19/1991	
Longitude	-87.82687	
Latitude	42.43084	

State ID	1209725067	MAP ID
Banks ID	1709700130	41
Owner Of Well	Busch & Larson	
Type Of Well	N/A	
Depth Drilled	198 '	
Completion Date	11/1/1976	
Longitude	-87.83021	
Latitude	42.43512	

State ID	1209724432	MAP ID
Banks ID	1709700131	42
Owner Of Well	H. Khayat	
Type Of Well	N/A	
Depth Drilled	220 '	
Completion Date	12/5/1975	
Longitude	-87.82669	
Latitude	42.42893	

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DETAILS

State ID	1209738419	MAP ID
Banks ID	1709700231	42
Owner Of Well	Robert May	
Type Of Well	N/A	
Depth Drilled	165 '	
Completion Date	7/20/1994	
Longitude	-87.82684	
Latitude	42.42902	

State ID	1209737098	MAP ID
Banks ID	1709700237	42
Owner Of Well	Scott Walldan	
Type Of Well	N/A	
Depth Drilled	159 '	
Completion Date	8/10/1992	
Longitude	-87.82689	
Latitude	42.42902	

State ID	1209745167	MAP ID
Banks ID	1709700240	42
Owner Of Well	Extra Value Liquors	
Type Of Well	Public Supply	
Depth Drilled	0 '	
Completion Date	N/A	
Longitude	-87.82689	
Latitude	42.42902	

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DETAILS

State ID	1209745166	MAP ID
Banks ID	1709700241	42
Owner Of Well	Al's Tap	
Type Of Well	Public Supply	
Depth Drilled	0 '	
Completion Date	N/A	
Longitude	-87.82684	
Latitude	42.42902	

State ID	1209725159	MAP ID
Banks ID	1709700133	43
Owner Of Well	Parker Peterson	
Type Of Well	N/A	
Depth Drilled	152 '	
Completion Date	2/1/1977	
Longitude	-87.8312	
Latitude	42.43315	

State ID	1209703079	MAP ID
Banks ID	1709700138	43
Owner Of Well	Charles Lotz	
Type Of Well	N/A	
Depth Drilled	165 '	
Completion Date	1/1/1971	
Longitude	-87.83117	
Latitude	42.4338	

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DETAILS

State ID	1209703281	MAP ID
Banks ID	1709700144	43
Owner Of Well	Charles T. Mason	
Type Of Well	N/A	
Depth Drilled	65 '	
Completion Date	5/1/1971	
Longitude	-87.83129	
Latitude	42.43237	

State ID	1209702623	MAP ID
Banks ID	1709700125	44
Owner Of Well	J. Fortner	
Type Of Well	N/A	
Depth Drilled	185 '	
Completion Date	1/1/1963	
Longitude	-87.83171	
Latitude	42.4345	

State ID	1209724711	MAP ID
Banks ID	1709700146	44
Owner Of Well	Hamms Concrete	
Type Of Well	N/A	
Depth Drilled	232 '	
Completion Date	10/1/1974	
Longitude	-87.83257	
Latitude	42.43445	

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DETAILS

State ID	1209729070	MAP ID
Banks ID	1709700164	44
Owner Of Well	Victor Smith	
Type Of Well	N/A	
Depth Drilled	215 '	
Completion Date	2/9/1987	
Longitude	-87.83166	
Latitude	42.43476	

State ID	1209738345	MAP ID
Banks ID	1709700227	44
Owner Of Well	Gary Reinhardt	
Type Of Well	N/A	
Depth Drilled	190 '	
Completion Date	7/6/1994	
Longitude	-87.83167	
Latitude	42.4345	

State ID	1209737096	MAP ID
Banks ID	1709700235	44
Owner Of Well	Sheila Fetherline	
Type Of Well	N/A	
Depth Drilled	269 '	
Completion Date	6/25/1992	
Longitude	-87.83171	
Latitude	42.4345	

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DETAILS

State ID	1209702625	MAP ID
Banks ID	1709700127	45
Owner Of Well	Mike Paslowsky	
Type Of Well	N/A	
Depth Drilled	176 '	
Completion Date	1/1/1963	
Longitude	-87.8317	
Latitude	42.42905	

State ID	1209727858	MAP ID
Banks ID	1709700168	45
Owner Of Well	Helen Khayat	
Type Of Well	N/A	
Depth Drilled	174 '	
Completion Date	3/13/1986	
Longitude	-87.8309	
Latitude	42.42959	

State ID	1209737741	MAP ID
Banks ID	1709700229	45
Owner Of Well	Bruce & Chris Galgan	
Type Of Well	N/A	
Depth Drilled	180 '	
Completion Date	8/5/1993	
Longitude	-87.8317	
Latitude	42.42905	

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DETAILS

State ID	1209701450	MAP ID
Banks ID	1709700119	46
Owner Of Well	Lotz Construction	
Type Of Well	N/A	
Depth Drilled	144 '	
Completion Date	6/1/1970	
Longitude	-87.82746	
Latitude	42.43267	

State ID	1209729422	MAP ID
Banks ID	1709700172	46
Owner Of Well	Mike Dugan	
Type Of Well	N/A	
Depth Drilled	150 '	
Completion Date	6/16/1987	
Longitude	-87.82807	
Latitude	42.43361	

State ID	1209733854	MAP ID
Banks ID	1709700183	46
Owner Of Well	David Ernstmeyer	
Type Of Well	N/A	
Depth Drilled	142 '	
Completion Date	8/12/1980	
Longitude	-87.82882	
Latitude	42.43302	

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DETAILS

State ID	1209735994	MAP ID
Banks ID	1709700205	46
Owner Of Well	C & S Builders	
Type Of Well	N/A	
Depth Drilled	157 '	
Completion Date	1/10/1991	
Longitude	-87.82925	
Latitude	42.43267	

State ID	1209735996	MAP ID
Banks ID	1709700207	46
Owner Of Well	Stacy Dickerson	
Type Of Well	N/A	
Depth Drilled	43 '	
Completion Date	9/20/1990	
Longitude	-87.82929	
Latitude	42.43267	

State ID	1209736294	MAP ID
Banks ID	1709700217	46
Owner Of Well	Perry Dalke	
Type Of Well	N/A	
Depth Drilled	180 '	
Completion Date	6/1/1991	
Longitude	-87.82685	
Latitude	42.43447	

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DETAILS

State ID	1209728546	MAP ID
Banks ID	1709700153	47
Owner Of Well	Robert Middleton	
Type Of Well	N/A	
Depth Drilled	225 '	
Completion Date	10/7/1986	
Longitude	-87.83052	
Latitude	42.43177	

State ID	1209730365	MAP ID
Banks ID	1709700165	47
Owner Of Well	Gary Post	
Type Of Well	N/A	
Depth Drilled	153 '	
Completion Date	4/25/1988	
Longitude	-87.83052	
Latitude	42.43172	

State ID	1209733858	MAP ID
Banks ID	1709700187	47
Owner Of Well	R.L. Humphres	
Type Of Well	N/A	
Depth Drilled	155 '	
Completion Date	6/28/1976	
Longitude	-87.83052	
Latitude	42.43177	

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DETAILS

State ID	1209733860	MAP ID
Banks ID	1709700189	47
Owner Of Well	Carl Michelsen	
Type Of Well	N/A	
Depth Drilled	170 '	
Completion Date	11/15/1980	
Longitude	-87.83052	
Latitude	42.43177	

State ID	1209733865	MAP ID
Banks ID	1709700194	47
Owner Of Well	Pitcher Construction	
Type Of Well	N/A	
Depth Drilled	166 '	
Completion Date	2/24/1975	
Longitude	-87.83052	
Latitude	42.43177	

State ID	1209733866	MAP ID
Banks ID	1709700195	47
Owner Of Well	Pitcher Construction	
Type Of Well	N/A	
Depth Drilled	166 '	
Completion Date	6/16/1975	
Longitude	-87.83052	
Latitude	42.43177	

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DETAILS

State ID	1209733867	MAP ID
Banks ID	1709700196	47
Owner Of Well	Pitcher Construction Co.	
Type Of Well	N/A	
Depth Drilled	169 '	
Completion Date	10/11/1976	
Longitude	-87.83047	
Latitude	42.43177	

State ID	1209736002	MAP ID
Banks ID	1709700213	47
Owner Of Well	Lucy's Appliances	
Type Of Well	N/A	
Depth Drilled	155 '	
Completion Date	11/9/1990	
Longitude	-87.83052	
Latitude	42.43177	

State ID	1209736005	MAP ID
Banks ID	1709700216	47
Owner Of Well	Victor L. Smith	
Type Of Well	N/A	
Depth Drilled	166 '	
Completion Date	9/28/1990	
Longitude	-87.83052	
Latitude	42.43177	

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DETAILS

State ID	1209738700	MAP ID
Banks ID	1709700199	48
Owner Of Well	Thersa Wilbanks	
Type Of Well	N/A	
Depth Drilled	180 '	
Completion Date	9/15/1983	
Longitude	-87.83476	
Latitude	42.43919	

State ID	1209724485	MAP ID
Banks ID	1709700135	49
Owner Of Well	Bill Nikkila	
Type Of Well	N/A	
Depth Drilled	186 '	
Completion Date	8/1/1975	
Longitude	-87.82916	
Latitude	42.42895	

State ID	1209724592	MAP ID
Banks ID	1709700139	49
Owner Of Well	Herbert Wubbell	
Type Of Well	N/A	
Depth Drilled	173 '	
Completion Date	9/1/1975	
Longitude	-87.8286	
Latitude	42.42854	

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DETAILS

State ID	1209703922	MAP ID
Banks ID	1709700143	49
Owner Of Well	Robert Ernstmeyer	
Type Of Well	N/A	
Depth Drilled	176 '	
Completion Date	5/1/1973	
Longitude	-87.82939	
Latitude	42.42882	

State ID	1209727421	MAP ID
Banks ID	1709700156	49
Owner Of Well	Ken Kruse	
Type Of Well	N/A	
Depth Drilled	175 '	
Completion Date	7/31/1985	
Longitude	-87.82932	
Latitude	42.42904	

State ID	1209727949	MAP ID
Banks ID	1709700171	49
Owner Of Well	Brooks Builders	
Type Of Well	N/A	
Depth Drilled	194 '	
Completion Date	4/1/1986	
Longitude	-87.83044	
Latitude	42.42855	

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DETAILS

State ID	1209735999	MAP ID
Banks ID	1709700210	49
Owner Of Well	Helena Khavat	
Type Of Well	N/A	
Depth Drilled	168 '	
Completion Date	4/27/1990	
Longitude	-87.82932	
Latitude	42.42904	

State ID	1209736000	MAP ID
Banks ID	1709700211	49
Owner Of Well	Helena Khavat	
Type Of Well	N/A	
Depth Drilled	200 '	
Completion Date	3/22/1990	
Longitude	-87.82932	
Latitude	42.42904	

State ID	1209736001	MAP ID
Banks ID	1709700212	49
Owner Of Well	Helena Khavat	
Type Of Well	N/A	
Depth Drilled	156 '	
Completion Date	10/27/1989	
Longitude	-87.82932	
Latitude	42.42904	

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DETAILS

State ID	1209726713	MAP ID
Banks ID	1709700163	50
Owner Of Well	Bo Rea	
Type Of Well	N/A	
Depth Drilled	160 '	
Completion Date	8/1/1978	
Longitude	-87.83395	
Latitude	42.4346	

State ID	1209737885	MAP ID
Banks ID	1709700221	50
Owner Of Well	Reggie Mosley	
Type Of Well	N/A	
Depth Drilled	175 '	
Completion Date	10/15/1993	
Longitude	-87.83414	
Latitude	42.43451	

State ID	1209738706	MAP ID
Banks ID	1709700223	50
Owner Of Well	Ram Builders	
Type Of Well	N/A	
Depth Drilled	182 '	
Completion Date	1/23/1995	
Longitude	-87.83414	
Latitude	42.43451	

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DETAILS

State ID	1209737740	MAP ID
Banks ID	1709700228	50
Owner Of Well	Helen Binning	
Type Of Well	N/A	
Depth Drilled	170 '	
Completion Date	7/2/1993	
Longitude	-87.83414	
Latitude	42.43451	

State ID	1209725218	MAP ID
Banks ID	1709700136	51
Owner Of Well	Lester Carman	
Type Of Well	N/A	
Depth Drilled	167 '	
Completion Date	4/1/1977	
Longitude	-87.83146	
Latitude	42.43024	

State ID	1209727931	MAP ID
Banks ID	1709700170	51
Owner Of Well	Eija Tuovinen	
Type Of Well	N/A	
Depth Drilled	222 '	
Completion Date	2/10/1986	
Longitude	-87.83268	
Latitude	42.43069	

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DETAILS

State ID	1209736482	MAP ID
Banks ID	1709700220	51
Owner Of Well	Helen Binning	
Type Of Well	N/A	
Depth Drilled	172 '	
Completion Date	12/17/1991	
Longitude	-87.83169	
Latitude	42.43087	

State ID	1209737425	MAP ID
Banks ID	1709700224	51
Owner Of Well	Carol Donev	
Type Of Well	N/A	
Depth Drilled	170 '	
Completion Date	10/2/1992	
Longitude	-87.83174	
Latitude	42.43087	

State ID	1209703010	MAP ID
Banks ID	1709700120	52
Owner Of Well	D. Spiegelberg	
Type Of Well	N/A	
Depth Drilled	190 '	
Completion Date	10/1/1969	
Longitude	-87.83313	
Latitude	42.43376	

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DETAILS

State ID	1209729906	MAP ID
Banks ID	1709700157	52
Owner Of Well	Victor Smith	
Type Of Well	N/A	
Depth Drilled	169 '	
Completion Date	8/17/1987	
Longitude	-87.83289	
Latitude	42.4336	

State ID	1209727465	MAP ID
Banks ID	1709700158	52
Owner Of Well	Tobey Delaney	
Type Of Well	N/A	
Depth Drilled	164 '	
Completion Date	7/20/1985	
Longitude	-87.83263	
Latitude	42.43251	

State ID	1209730397	MAP ID
Banks ID	1709700166	52
Owner Of Well	James Wolden	
Type Of Well	N/A	
Depth Drilled	196 '	
Completion Date	11/11/1987	
Longitude	-87.83172	
Latitude	42.43269	

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DETAILS

State ID	1209733855	MAP ID
Banks ID	1709700184	52
Owner Of Well	Warren Esperson	
Type Of Well	N/A	
Depth Drilled	55 '	
Completion Date	12/23/1982	
Longitude	-87.83215	
Latitude	42.43253	

State ID	1209738624	MAP ID
Banks ID	1709700222	52
Owner Of Well	Ram Builders	
Type Of Well	N/A	
Depth Drilled	172 '	
Completion Date	9/20/1994	
Longitude	-87.83289	
Latitude	42.4336	

State ID	1209738151	MAP ID
Banks ID	1709700225	52
Owner Of Well	Ram Builders	
Type Of Well	N/A	
Depth Drilled	170 '	
Completion Date	3/14/1994	
Longitude	-87.83293	
Latitude	42.43365	

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DETAILS

State ID	1209737095	MAP ID
Banks ID	1709700234	52
Owner Of Well	Joe Buttera	
Type Of Well	N/A	
Depth Drilled	192 '	
Completion Date	5/31/1992	
Longitude	-87.83168	
Latitude	42.43269	

State ID	1209724992	MAP ID
Banks ID	1709700150	53
Owner Of Well	English Construction	
Type Of Well	N/A	
Depth Drilled	184 '	
Completion Date	11/1/1976	
Longitude	-87.82938	
Latitude	42.4302	

State ID	1209724993	MAP ID
Banks ID	1709700151	53
Owner Of Well	Smythe Construction	
Type Of Well	N/A	
Depth Drilled	165 '	
Completion Date	9/1/1976	
Longitude	-87.82827	
Latitude	42.42977	

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DETAILS

State ID	1209727349	MAP ID
Banks ID	1709700155	53
Owner Of Well	James Wolden	
Type Of Well	N/A	
Depth Drilled	200 '	
Completion Date	7/11/1985	
Longitude	-87.82926	
Latitude	42.43085	

State ID	1209726711	MAP ID
Banks ID	1709700161	53
Owner Of Well	Lester Carman	
Type Of Well	N/A	
Depth Drilled	200 '	
Completion Date	9/1/1978	
Longitude	-87.8295	
Latitude	42.43036	

State ID	1209726821	MAP ID
Banks ID	1709700167	53
Owner Of Well	Busch & Larson	
Type Of Well	N/A	
Depth Drilled	198 '	
Completion Date	3/1/1979	
Longitude	-87.83034	
Latitude	42.43108	

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DETAILS

State ID	1209727174	MAP ID
Banks ID	1709700175	53
Owner Of Well	Al Larson	
Type Of Well	N/A	
Depth Drilled	220 '	
Completion Date	3/11/1985	
Longitude	-87.83025	
Latitude	42.43002	

State ID	1209733851	MAP ID
Banks ID	1709700180	53
Owner Of Well	Busch & Larson	
Type Of Well	N/A	
Depth Drilled	198 '	
Completion Date	3/2/1979	
Longitude	-87.82992	
Latitude	42.4311	

State ID	1209737097	MAP ID
Banks ID	1709700236	53
Owner Of Well	David Johnson	
Type Of Well	N/A	
Depth Drilled	168 '	
Completion Date	6/10/1992	
Longitude	-87.82926	
Latitude	42.43085	

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DETAILS

State ID	1209727293	MAP ID
Banks ID	1709700239	53
Owner Of Well	Larry Patrone	
Type Of Well	N/A	
Depth Drilled	175 '	
Completion Date	2/19/1990	
Longitude	-87.82926	
Latitude	42.43085	

State ID	1209747796	MAP ID
Banks ID	1709700246	54
Owner Of Well	IL Beach Park/Concession	
Type Of Well	N/A	
Depth Drilled	8 '	
Completion Date	7/18/2002	
Longitude	-87.80718	
Latitude	42.43252	

State ID	1209747797	MAP ID
Banks ID	1709700247	54
Owner Of Well	IL Beack Park/Concession	
Type Of Well	N/A	
Depth Drilled	15 '	
Completion Date	7/18/2002	
Longitude	-87.80718	
Latitude	42.43252	

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Water Well Report TM

DETAILS

State ID	1209747800	MAP ID
Banks ID	1709700249	54
Owner Of Well	IL Beack Park/Concession	
Type Of Well	N/A	
Depth Drilled	8'	
Completion Date	7/18/2002	
Longitude	-87.80724	
Latitude	42.43251	

State ID	1209747799	MAP ID
Banks ID	1709700248	55
Owner Of Well	IL Beach Park/Concession	
Type Of Well	N/A	
Depth Drilled	15'	
Completion Date	7/18/2002	
Longitude	-87.80658	
Latitude	42.43023	

State ID	1209747798	MAP ID
Banks ID	1709700251	55
Owner Of Well	IL Beach Park/Concession	
Type Of Well	N/A	
Depth Drilled	15'	
Completion Date	7/18/2002	
Longitude	-87.80658	
Latitude	42.43023	

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DETAILS

State ID	1209702324	MAP ID
Banks ID	1709700252	56
Owner Of Well	F.H. Ferguson	
Type Of Well	N/A	
Depth Drilled	149 '	
Completion Date	N/A	
Longitude	-87.82192	
Latitude	42.43807	

State ID	1209702325	MAP ID
Banks ID	1709700253	57
Owner Of Well	Geo Shaw	
Type Of Well	N/A	
Depth Drilled	156 '	
Completion Date	N/A	
Longitude	-87.82438	
Latitude	42.43077	

State ID	1209702321	MAP ID
Banks ID	1709700254	58
Owner Of Well	Beach State Park	
Type Of Well	N/A	
Depth Drilled	510 '	
Completion Date	N/A	
Longitude	-87.80473	
Latitude	42.43066	

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Water Well Report

TM

DETAILS

State ID	1209747795	MAP ID
Banks ID	1709700255	59
Owner Of Well	IL Beach Park/Concession	
Type Of Well	N/A	
Depth Drilled	8'	
Completion Date	7/18/2002	
Longitude	-87.80472	
Latitude	42.43249	

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Water Well Report TM

TM

SUMMARY

Water Well Report TM Research Mapping Protocol

The Banks Information Solutions, Inc. Water Well Report TM is prepared from existing state water well databases and additional file data/records research conducted at Texas' regulatory authorities. Submission of driller's log records upon completion of a drilled water well became mandatory in 1985. The state of Texas has processed these records into several different filing systems within two state regulatory authorities. The water well files, records and map locations are maintained by the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB). Actual water well site locations of this report are geocoded and geoplotted directly from the drilling records, drilling schedules, and driller's logs and maps submitted by the water well driller and maintained at these two primary water well regulatory authorities. Below is a description of the four filing systems utilized for well drilling records.

Texas Water Development Board (TWDB)

Texas Water Development Board maintains a file system of located water well locations. These well files are water well site locations that have been verified with a field inventory inspection by TWDB personnel. The wells are assigned a State Identification Number unique to that well and plotted on county base maps, U.S.G.S. 7.5 minute topographical quadrangle maps, and in-house geographic information system. Records will also include analytical data attached with each drilling record. This is the current protocol for maintaining water well records within the TWDB.

Texas Commission on Environmental Quality (TCEQ)

The Texas Commission on Environmental Quality maintains a file system of plotted, partially numbered, and un-numbered water well locations. Plotted water well files are water well site locations that have been determined from map information submitted on water well logs and subsequently plotted on TWDB county highway base maps. This type of mapping and filing procedure ceased in June 1986. Partially numbered water well files are water well site locations processed from 1986 through 1990. These wells are provided a State Identification Number which establishes the well location somewhere within a 2.5 minute quadrant of a 7.5 minute quadrangle map, but the site location has never been precisely mapped or verified by a State of Texas staff member. Un-numbered water well files are water well site locations that have been processed since June 1990. These well records are filed solely on their county location and are not provided a State Identification Number nor are they mapped. This is the current protocol for maintaining water well records within the TCEQ.

Disclaimer

Banks Information Solutions, Inc. has performed a thorough and diligent search of all wells recorded with the Texas Water Development Board and the Texas Commission on Environmental Quality. All mapped locations are based on information obtained from the TWDB and the TCEQ. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the water well driller. Many water well schedules may have never been submitted to the regulatory authority by the water well driller and, thus, may explain the possible unaccountability of private drilled wells. It is uncertain if the above listing provides 100% of the existing well locations within the area of review. Therefore, Banks Information Solutions, Inc. cannot guarantee the accuracy of the data or well location(s) of those maps and records maintained by Texas' regulatory authorities.

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Water Well	Top	Bottom
silty clay leached black 10YR2/1	0	5
dm silty clay loam calc olive brown 2.5Y4/4	5	10
dm silty clay loam gravelly, lighter downwards? calc dark grayish brown 10YR4/2	10	50
dm silty to sand loam very gravelly calc grayish borwn 10YR5/2	50	55
gravel and coarse sand, dol, shale & ign lith very salt & pepper looking calc	55	60
Total Depth		62

Driller's Log filed
Sample set # 20022, (0' - 60')



Permit Date: Permit #: 0

COMPANY Madsen, Charles
 FARM Sekowski J
 DATE DRILLED January 1, 1950 NO. 1
 ELEVATION 0 COUNTY NO. 02313
 LOCATION SW NE
 LATITUDE 42.451670 LONGITUDE - 87.832717
 COUNTY Lake API 120970231300 21 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		200
Driller's Log filed		
Permit Date:	Permit #:	



COMPANY Alco Oil & Gas Corp.
 FARM Loblow W T
 DATE DRILLED NO.
 ELEVATION 645GL COUNTY NO. 02312
 LOCATION NE SW SE
 LATITUDE 42.445346 LONGITUDE - 87.831542
 COUNTY Lake API 120970231200

21 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well Top Bottom

Total Depth 82
 Driller's Log filed
 Survey Sample Study filed
 Sample set # 22143 (0' - 82')



Permit Date: Permit #: 0

COMPANY Madsen, Charles
 FARM Sekowski J

DATE DRILLED January 1, 1952 NO. 2

ELEVATION 0 COUNTY NO. 02317

LOCATION

LATITUDE 42.449874 LONGITUDE - 87.835149

COUNTY Lake API 120970231700 21 - 46N - 12E



APPROVED BY: [Signature] DATE: 1/15/52



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		1569
Driller's Log filed		

Permit Date: Permit #:

COMPANY Alco Oil & Gas Corp.
 FARM Shiloh Park
 DATE DRILLED NO.
 ELEVATION 648GL COUNTY NO. 02314
 LOCATION
 LATITUDE 42.449874 LONGITUDE - 87.835149
 COUNTY Lake API 120970231400



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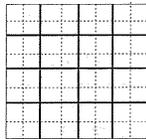
Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

	Top	Bottom
Total Depth		1025
Driller's Log filed Survey Sample Study filed Sample set # 485 (163' - 1025')		
Permit Date:	Permit #:	



00032001

COMPANY Layne Bowler Co
 FARM Zion City Wel
 DATE DRILLED NO. 1
 ELEVATION 631GL COUNTY NO. 02316
 LOCATION NE SE SE
 LATITUDE 42.445324 LONGITUDE -87.826693
 COUNTY Lake API 120970231600 21 - 46N - 12E



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		175
Driller's Log filed		
Permit Date:	Permit #:	

COMPANY
FARM Heat Plant
DATE DRILLED
ELEVATION 635GL
LOCATION NE SE SE
LATITUDE 42.445324
COUNTY Lake

NO.
COUNTY NO. 02051
LONGITUDE - 87.826693
API 120970205100

21 - 46N - 12E



00036001

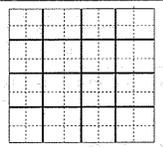
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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
existing well	0	140
rock	140	180
Total Depth		180
Casing: 4" STEEL 11# from 0' to 140'		
Size hole below casing: 4"		
Water from rock at 0' to 180'.		
Static level 110' below casing top which is 1' above GL		
Pumping level 115' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 175' on June 20, 1992, with a capacity of 10 gpm		
Additional location info: Lot #1, Beach Homeland subdivision.		
Address of well: Beach Park, IL		
Location source: Location from permit		
Permit Date: June 5, 1992		Permit #:



COMPANY Gross, Eugene J.
 FARM Hanson, Tom C.
 DATE DRILLED NO.
 ELEVATION 0 COUNTY NO. 37424
 LOCATION SW SW NE
 LATITUDE 42.4507 LONGITUDE - 87.806694
 COUNTY Lake API 120973742400 23 - 46N - 12E



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Engineering Test	Top	Bottom
fill	0	2
organic rich sand	2	3
medium sand	3	14
probably till at	15	15
coarse sand	14	15
Total Depth		15



Permit Date: Permit #:

COMPANY Hester, Norm, I.S.G.S
FARM City of Zion
DATE DRILLED November 1, 1972 NO. 34
ELEVATION 0 COUNTY NO. 26844
LOCATION
LATITUDE 42.449792 LONGITUDE - 87.815605
COUNTY Lake API 120972684400

22 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		154
Driller's Log filed		



00041001

Permit Date:

Permit #:

COMPANY Ferguson F H

FARM

DATE DRILLED

NO.

ELEVATION 611GL

COUNTY NO. 02319

LOCATION W2 SW

LATITUDE 42.446210

LONGITUDE - 87.823011

COUNTY Lake

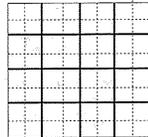
API 120970231900

22 - 46N - 12E

Water Well	Top	Bottom
Total Depth		225
Driller's Log filed		
Permit Date:	Permit #:	



COMPANY Ferguson F H
FARM Hotel Zion Home
DATE DRILLED NO.
ELEVATION 630GL COUNTY NO. 02320
LOCATION NW SW
LATITUDE 42.448017 LONGITUDE - 87.823003
COUNTY Lake API 120970232000



22 - 46N - 12E

Water Well	Top	Bottom
fill, yellow clay	0	2
topsoil	2	3
yellow clay	3	5
sand	5	34
very sandy clay	34	50
blue clay	50	78
sand & some gravel	78	95
gravel	95	99
limestone	99	121
Total Depth		120
Casing: 5" GALV T&C 14.81 from 0' to 99'		
Size hole below casing: 5"		
Water from limestone at 99' to 120'.		
Static level 15' below casing top which is 1' above GL		
Pumping level 50' when pumping at 20 gpm for 0 hours		
Permanent pump installed at 63' on , with a capacity of 5 gpm		
Driller's Log filed		
Location source: Location from permit		
Permit Date:	Permit #: 7991	



COMPANY Hoover Water Well Servic
 FARM Justin, Alvin
 DATE DRILLED August 7, 1969 NO.
 ELEVATION 590GL COUNTY NO. 02926
 LOCATION 50'S 800'E NW/c
 LATITUDE 42.456810 LONGITUDE - 87.802771
 COUNTY Lake API 120970292600

23 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
sand	0	34
blue clay	34	48
hardpan	48	83
sand	83	91
hardpan	91	102
limestone	102	142
Total Depth		142
Casing: 4" GALV T&C 10.89 PPF from 0' to 102'		
Size hole below casing: 4"		
Water from limestone at 102' to 142'.		
Static level 10' below casing top which is 1' above GL		
Pumping level 142' when pumping at 2 gpm for 0 hours		
Permanent pump installed at 126' on , with a capacity of 8 gpm		
Driller's Log filed		
Location source: Location from permit		
Permit Date: October 28, 1970		Permit #: 10971



COMPANY Hoover Water Well Servic
 FARM Spencer, Harry G.
 DATE DRILLED November 20, 1970 NO.
 ELEVATION 590GL COUNTY NO. 03060
 LOCATION 50'S 1150'E NW/c NW
 LATITUDE 42.456803 LONGITUDE - 87.801469
 COUNTY Lake API 120970306000

23 - 46N - 12E

Water Well	Top	Bottom
Total Depth		138
Driller's Log filed		
Permit Date:	Permit #:	

COMPANY Ferguson F H
 FARM Zion Estates
 DATE DRILLED NO.
 ELEVATION 585GL COUNTY NO. 02322
 LOCATION SW
 LATITUDE 42.446046 LONGITUDE - 87.800889
 COUNTY Lake API 120970232200

23 - 46N - 12E



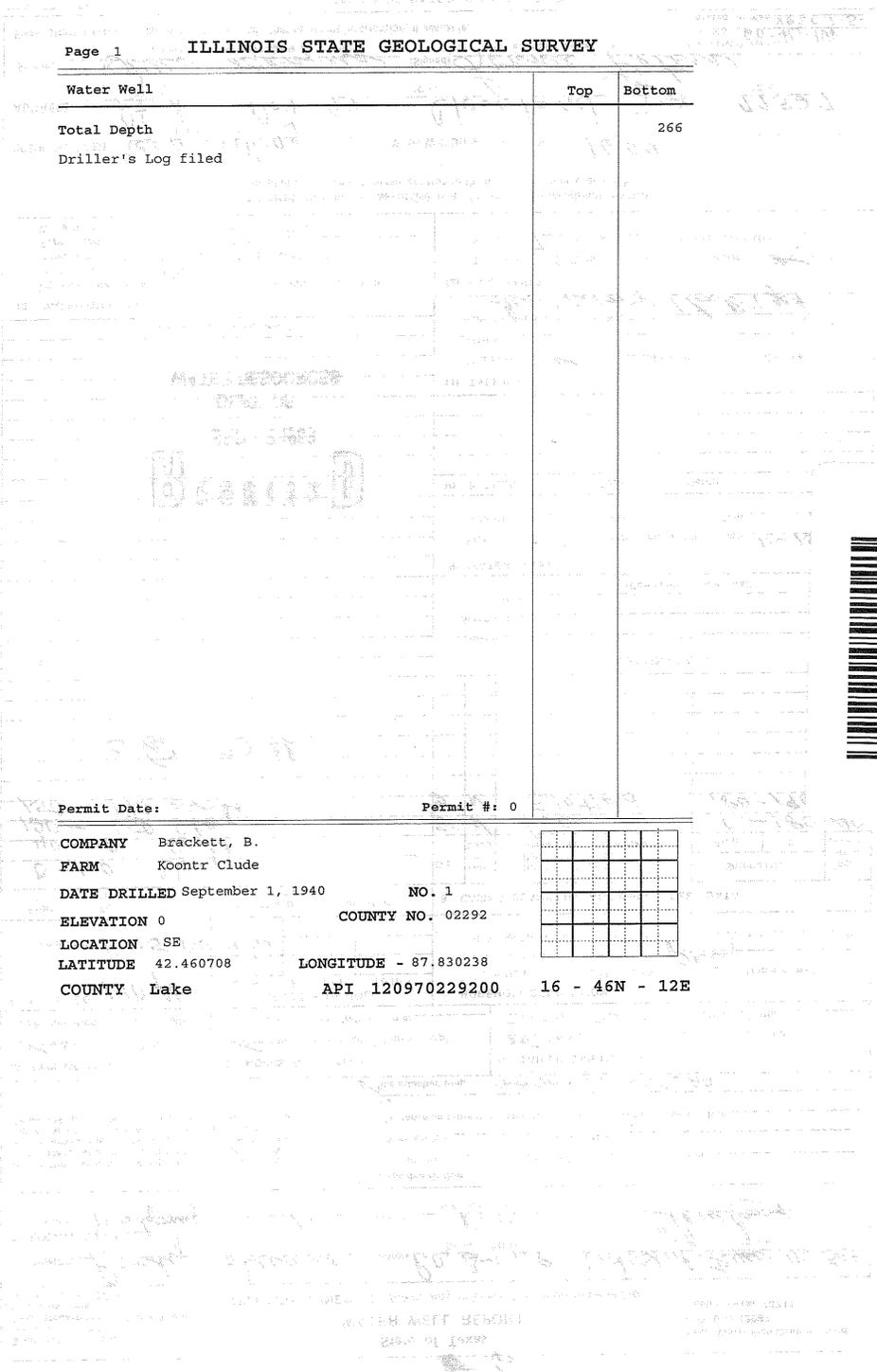
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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		266
Driller's Log filed		

Permit Date: Permit #: 0

COMPANY Brackett, B.
 FARM Koontr Clude
 DATE DRILLED September 1, 1940 NO. 1
 ELEVATION 0 COUNTY NO. 02292
 LOCATION SE
 LATITUDE 42.460708 LONGITUDE - 87.830238
 COUNTY Lake API 120970229200 16 - 46N - 12E



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		219
Driller's Log filed		
Permit Date: Permit #: 0		

COMPANY Boysen, Henry, Jr.
FARM Busch & Larson
DATE DRILLED January 1, 1976 **NO.**
ELEVATION 0 **COUNTY NO.** 25154
LOCATION 200'S line, 50'E line of SW NE SE
LATITUDE 42.461250 **LONGITUDE** 87.827997
COUNTY Lake **API** 120972515400 **16 - 46N - 12E**



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
brown clay	0	8
blue clay	8	13
gravel	13	15
sandy blue clay	15	90
hardpan	90	108
soft blue clay	108	129
gravel	129	131
limestone	131	195
Total Depth		195
Casing: 5" PVC from 0' to 112' 5" STEEL from 112' to 133'		
Size hole below casing: 5"		
Water from limestone at 0' to 0'.		
Static level 89' below casing top which is 1' above GL		
Pumping level 0' when pumping at 5 gpm for 0 hours		
Driller's Log filed		
Address of well: 1405 Winthrop		
Location source: Location from permit		
Permit Date: December 8, 1976 Permit #: 55497		



COMPANY Henry Boysen Co./Lichter, J.P.
 FARM Busch & Larson
 DATE DRILLED January 24, 1977 NO.
 ELEVATION 0 COUNTY NO. 25155
 LOCATION 200'S line, 200'E line of SW NE SE
 LATITUDE 42.461252 LONGITUDE - 87.828555
 COUNTY Lake API 120972515500

16 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		322
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover Water Well Servic
 FARM Richardson Paul
 DATE DRILLED July 1, 1971 NO.
 ELEVATION 0 COUNTY NO. 03280
 LOCATION 675'S line, 900'E line of section
 LATITUDE 42.458930 LONGITUDE - 87.828754
 COUNTY Lake API 120970328000

16 - 46N - 12E

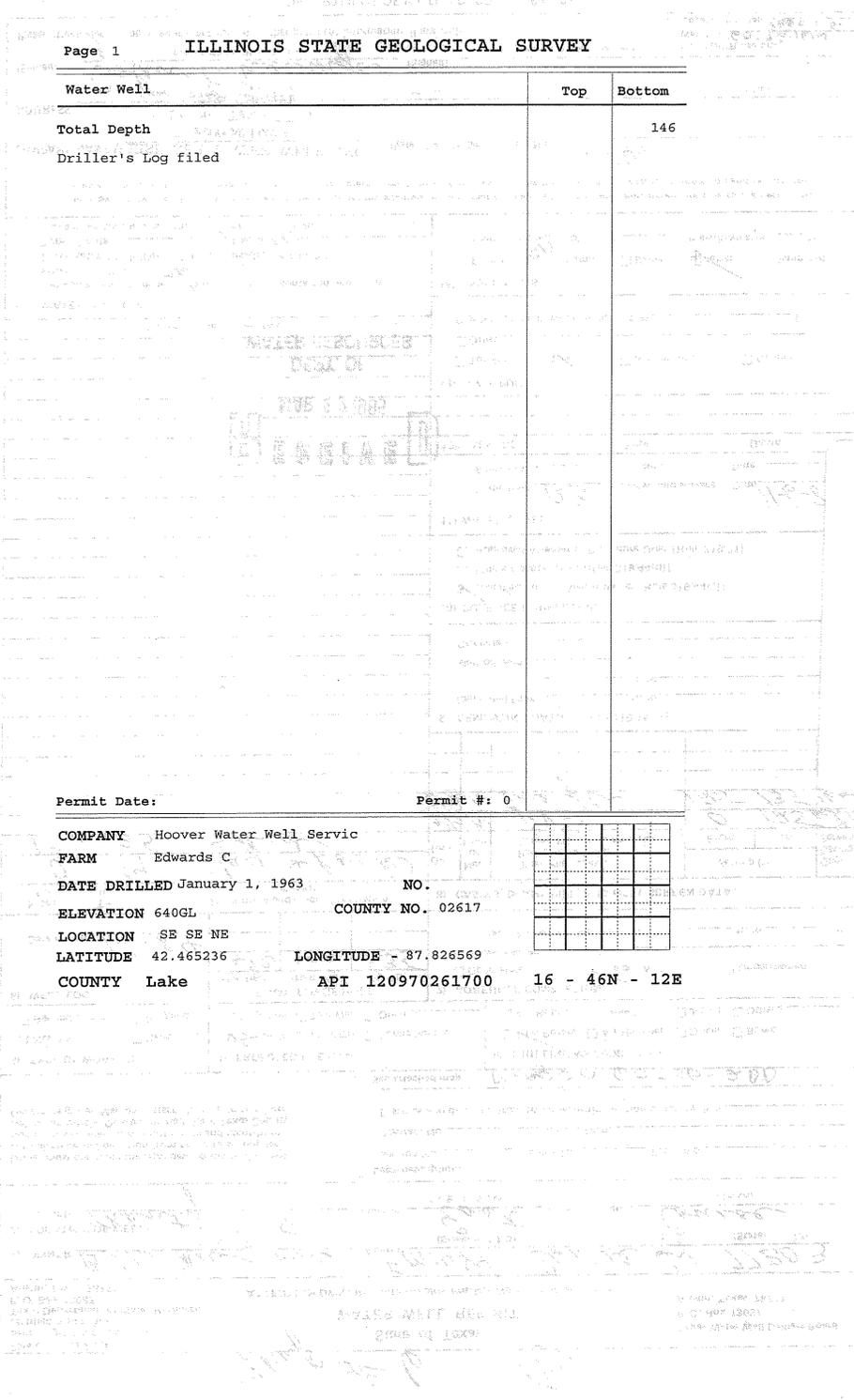
Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well Top Bottom

Total Depth 146
Driller's Log filed

Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic
 FARM Edwards C
 DATE DRILLED January 1, 1963 NO.
 ELEVATION 640GL COUNTY NO. 02617
 LOCATION SE SE NE
 LATITUDE 42.465236 LONGITUDE - 87.826569
 COUNTY Lake API 120970261700 16 - 46N - 12E



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		160
<p>Driller's Log filed</p> <p>NO CASEY: OR DISCREPANCY NOTED</p> <p>NO CHECKED PROPERTIES NOTED</p>		
<p>ORDER NO. 1000</p> <p>DATE DRILLED January 1, 1963</p> <p>ELEVATION 642GL</p> <p>LOCATION SE SE NE</p> <p>LATITUDE 42.465236 LONGITUDE -87.826569</p> <p>COUNTY Lake COUNTY API 120970261800</p>		
<p>COMPANY Hoover Water Well Service</p> <p>FARM Edwards C</p>		
<p>PERMIT # 0</p>		
<p>DATE DRILLED January 1, 1963</p>		
<p>ELEVATION 642GL</p>		
<p>LOCATION SE SE NE</p>		
<p>LATITUDE 42.465236 LONGITUDE -87.826569</p>		
<p>COUNTY Lake COUNTY API 120970261800</p>		



PS-10-1

Page 1 **ILLINOIS STATE GEOLOGICAL SURVEY**

Water Well	Top	Bottom
Total Depth		137
Driller's Log filed		
Permit Date	Permit #	0

COMPANY Hoover Water Well Servic
FARM Jorgenson H

DATE DRILLED January 1, 1963 **NO.**

ELEVATION 638GL **COUNTY NO.** 02619

LOCATION SE SE NE

LATITUDE 42.465236 **LONGITUDE** -87.826569

COUNTY Lake **API** 120970261900 **16 - 46N - 12E**



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well (CARRIED OVER FROM PREVIOUS PAGE)		Top	Bottom
Total Depth			315
<p>Driller's Log filed</p> <p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>			
<p>PERMIT DATE: May 1, 1968</p> <p>PERMIT NO.: 0</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	
<p>COMPANY: Hoover Water Well Service</p> <p>FARM: Casteel A R</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	
<p>DATE DRILLED: May 1, 1968</p> <p>COUNTY NO.: 02798</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	
<p>ELEVATION: 0</p> <p>LOCATION: 2500' N line, 50' W line of NW 340</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	
<p>LATITUDE: 42.464699</p> <p>LONGITUDE: -87.825173</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	
<p>COUNTY: Lake</p> <p>API: 120970279800</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	
<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>		<p>NO RECORD OF INVESTIGATIONS MADE</p> <p>NO CHEMICAL ANALYSES MADE</p>	



90-78-1

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
yellow sand & gravel	0	24
gravel	24	42
hardpan, dry gravel	42	89
sand, gravel, blue clay	89	127
large gravel & boulders	127	138
Total Depth		138
Casing: 5" GALV T&C 14.81 PPF from 0' to 138'		
Size hole below casing: 5"		
Water from large gravel at 127' to 138'.		
Static level 75' below casing top which is 1' above GL		
Pumping level 135' when pumping at 3 gpm for 0 hours		
Permanent pump installed at 126' on , with a capacity of 8 gpm		
Driller's Log filed		
Location source: Location from permit		
Permit Date: October 10, 1973		
Permit #: 25936		



COMPANY Hoover, L. R.
 FARM Si Henarichs Agency
 DATE DRILLED November 12, 1973 NO.
 ELEVATION 0 COUNTY NO. 24153
 LOCATION 1150'S 450'W NE/c NE
 LATITUDE 42.468423 LONGITUDE - 87.827003
 COUNTY Lake API 120972415300

16 - 46N - 12E

Water Well	Top	Bottom
gravel	0	4
sand	4	20
hardpan	20	90
blue clay	90	127
hardpan	127	130
limestone	130	145
Total Depth		145
Casing: 5" GALV 15# from 0' to 130'		
Size hole below casing: 5"		
Water from limestone at 130' to 145'.		
Static level 75' below casing top which is 1' above GL		
Pumping level 130' when pumping at 10 gpm for 4 hours		
Permanent pump installed at 140' on September 30, 1978, with a capacity of 10 gpm		
Driller's Log filed		
Location source: Platbook verified		
Permit Date: September 21, 1978		Permit #: 79780



COMPANY Gross, Emil E.
 FARM Griffith, Bruce
 DATE DRILLED September 21, 1978 NO.
 ELEVATION 0 COUNTY NO. 26697
 LOCATION 150'N 200'E SW/c NE NE SE
 LATITUDE 42.462926 LONGITUDE - 87.827055
 COUNTY Lake API 120972669700

16 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		274
Driller's Log filed		
Permit Date:	Permit #: 0	

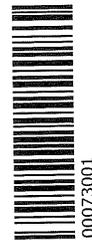
COMPANY Hoover, L. R.
 FARM Watts Clayton
 DATE DRILLED December 1, 1977 NO.
 ELEVATION 0 COUNTY NO. 26818
 LOCATION 100'N line, 330'W line of NW NE SE
 LATITUDE 42.464060 LONGITUDE - 87.828987
 COUNTY Lake API 120972681800

16 - 46N - 12E



Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		190
Driller's Log filed		



Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic
 FARM Freemark Howard
 DATE DRILLED December 1, 1976 NO.
 ELEVATION 0 COUNTY NO. 25157
 LOCATION 650'N line, 325'E line of SE
 LATITUDE 42.462537 LONGITUDE - 87.826584
 COUNTY Lake API 120972515700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
sandy clay	0	22
hardpan	22	62
clay	62	70
stoney clay	70	107
slick clay	107	127
gravel	127	129
limestone	129	168
Total Depth		168
Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 129'		
Size hole below casing: 5"		
Water from rock at 0' to 0'.		
Static level 100' below casing top which is 1' above GL		
Pumping level 129' when pumping at 8 gpm for 1 hour		
Additional location info: Lot 8, Sheridan Lake View subdivision. 2nd Addition		
Location source: Location from permit		
Permit Date: February 24, 1986		Permit #: 122381



COMPANY Hoover, Lonny R.
 FARM Blagg, William Jr.
 DATE DRILLED February 14, 1986 NO.
 ELEVATION 0 COUNTY NO. 27962
 LOCATION SE NE SE
 LATITUDE 42.461603 LONGITUDE - 87.826596
 COUNTY Lake API 120972796200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
black dirt	0	1
yellow clay	1	15
hardpan	15	75
blue clay	75	124
limestone	124	150
Total Depth		150
Casing: 5" GALV from 0' to 150'		
Size hole below casing: 5"		
Water from limestone at 124' to 150'.		
Static level 95' below casing top which is 1' above GL		
Pumping level 147' when pumping at 3 gpm for 0 hours		
Permanent pump installed at 147' on , with a capacity of 11 gpm		
Additional Lot 12, W. A. Cannon subdivision.		
location info:		
Location source: Field verified		
Permit Date: December 2, 1983		Permit #: 110645



COMPANY Gross, Michael
 FARM Veterans Administration 265
 DATE DRILLED December 8, 1983 NO.
 ELEVATION 0 COUNTY NO. 33750
 LOCATION 2050'S line, 70'W line of NW SW
 LATITUDE 42.466337 LONGITUDE - 87.825087
 COUNTY Lake API 120973375000

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		119
Driller's Log filed		



Permit Date: Permit #: 0

COMPANY Green M L
 FARM Nacker Wm
 DATE DRILLED January 1, 1940 NO. 1
 ELEVATION 0 COUNTY NO. 02287
 LOCATION 420'N line, 1800'E line of SW
 LATITUDE 42.463150 LONGITUDE - 87.822261
 COUNTY Lake API 120970228700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
topsoil	0	1
sand	1	36
blue clay	36	56
gravel	56	110
Total Depth		110
Casing: 4.5" GALV from 0' to 110'		
Size hole below casing: 4.5"		
Water from gravel at 56' to 110'.		
Static level 4' below casing top which is 0' above GL		
Pumping level 10' when pumping at 15 gpm for 15 hours		
Driller's Log filed		
Permit Date:	Permit #: 0	



COMPANY Boysen, Henry, Jr.
 FARM Camp Logan
 DATE DRILLED January 1, 1941 NO.
 ELEVATION 0 COUNTY NO. 02288
 LOCATION 2310'S 990'W NE/c NE
 LATITUDE 42.465117 LONGITUDE - 87.809448
 COUNTY Lake API 120970228800

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
sand	0	9
gravel & clay	9	121
gravel	121	124
limestone	124	127
Total Depth		127
Casing: 5" GALV T&C 14.81 PPF from 0' to 124'		
Size hole below casing: 5"		
Water from limestone at 124' to 127'.		
Static level 33' below casing top which is 1' above GL		
Pumping level 75' when pumping at 10 gpm for 0 hours		
Permanent pump installed at 105' on November 29, 1976, with a capacity of 8 gpm		
Driller's Log filed		
Location source: Location from permit		
Permit Date: October 19, 1976		Permit #: 53776



COMPANY Hoover, L. R.
 FARM Anderson, Craig
 DATE DRILLED November 18, 1976 NO.
 ELEVATION 0 COUNTY NO. 25066
 LOCATION 1125'S 350'W NE/c NW
 LATITUDE 42.468431 LONGITUDE - 87.816854
 COUNTY Lake API 120972506600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		130
Driller's Log filed		
Permit Date:	Permit #: 0	



COMPANY Hoover Water Well Servic
 FARM Fout James
 DATE DRILLED January 1, 1963 NO.
 ELEVATION 613GL COUNTY NO. 02614
 LOCATION NE NE NW
 LATITUDE 42.470622 LONGITUDE - 87.816769
 COUNTY Lake API 120970261400

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		141
Driller's Log filed		
Permit Date:	Permit #:	0

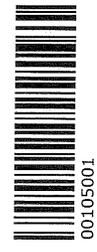
COMPANY Hoover, L. R.
 FARM Holland Billy
 DATE DRILLED November 1, 1971 NO.
 ELEVATION 0 COUNTY NO. 03416
 LOCATION 600'N line, 675'E line of NW
 LATITUDE 42.469885 LONGITUDE - 87.818060
 COUNTY Lake API 120970341600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		266
Driller's Log filed		
Permit Date:	Permit #: 0	



COMPANY Hoover, L. R.
 FARM Sihendrick Agy
 DATE DRILLED January 1, 1974 NO.
 ELEVATION 0 COUNTY NO. 24152
 LOCATION 550'N line, 1250'E line of SW
 LATITUDE 42.462777 LONGITUDE - 87.820217
 COUNTY Lake API 120972415200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		177
Driller's Log filed		
Permit Date:	Permit #:	0

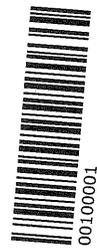
COMPANY Hoover Water Well Servic
FARM McNabb Harold
DATE DRILLED January 1, 1963 NO.
ELEVATION 621GL COUNTY NO. 02616
LOCATION NW NE SW
LATITUDE 42.463381 LONGITUDE - 87.819242
COUNTY Lake API 120970261600



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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
topsoil	0	3
sand	3	14
hardpan	14	85
blue clay	85	130
gravel	130	134
Total Depth		134
Casing: 4" GALV 11# from 0' to 134'		
Water from gravel at 130' to 134'.		
Static level 55' below casing top which is 1' above GL		
Pumping level 65' when pumping at 10 gpm for 4 hours		
Permanent pump installed at 84' on , with a capacity of 10 gpm		
Driller's Log filed		
Additional Lot 9 Blk. 23, Kelloggs subdivision. location info:		
Location source: Location from permit		
Permit Date:	Permit #: NF14790	



COMPANY Gross, Emil E.
 FARM Neal, Ray
 DATE DRILLED June 2, 1972 NO.
 ELEVATION 0 COUNTY NO. 03881
 LOCATION NE SW
 LATITUDE 42.462466 LONGITUDE - 87.818022
 COUNTY Lake API 120970388100

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		143
Driller's Log filed		
Permit Date:	Permit #:	0

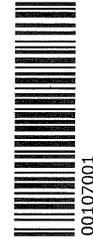


COMPANY Hoover, L. R.
 FARM Markabrad Steve
 DATE DRILLED May 1, 1973 NO.
 ELEVATION 0 COUNTY NO. 03921
 LOCATION 700'N line, 600'E line of SW
 LATITUDE 42.462350 LONGITUDE - 87.817802
 COUNTY Lake API 120970392100

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		167
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover, L. R.
FARM Klemin Albert
DATE DRILLED July 1, 1974 NO.
ELEVATION 0 COUNTY NO. 24252
LOCATION 350'S line, 950'W line of section
LATITUDE 42.458007 LONGITUDE - 87.821880
COUNTY Lake API 120972425200

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Private Water Well	Top	Bottom
yellow clay	0	12
sand	12	18
hardpan	18	40
brown clay	40	43
sand-gravel	43	46
Total Depth		46
Casing: 4" GALV STEEL 11# from 0' to 44'		
Screen: 3' of 4" diameter 15 slot		
Size hole below casing: 4"		
Water from sand-gravel at 43' to 46'.		
Static level 18' below casing top which is 1' above GL		
Pumping level 18' when pumping at 10 gpm for 0 hours		
Permanent pump installed at 30' on , with a capacity of 10 gpm		
Additional location info: Lot 18, Kellog's Homesite subdivision.		
Address of well: 9714 16th St.		
Location source: Field verified		
Permit Date: March 27, 1987		
Permit #: 130221		



COMPANY Gross, Michael
 FARM Conde, Ron
 DATE DRILLED March 3, 1987 NO.
 ELEVATION 0 COUNTY NO. 29270
 LOCATION 1940'N line, 1420'W line of SE NW
 LATITUDE 42.462549 LONGITUDE - 87.815193
 COUNTY Lake API 120972927000

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Private Water Well	Top	Bottom
gravel, sand & clay	0	20
sandy clay	20	60
hardpan	60	76
limestone	102	102
clay	76	102
no record	102	136
Total Depth		136
Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 102'		
Size hole below casing: 5"		
Water from rock at 0' to 0'.		
Static level 40' below casing top which is 1' above GL		
Pumping level 126' when pumping at 2 gpm for 1 hour		
Permanent pump installed at 126' on May 15, 1986, with a capacity of 4 gpm		
Additional location info: Lot 3, Harbor Kellog's subdivision. Block #6		
Address of well: 17th & Park Ave.		
Location source: Field verified		
Permit Date: April 22, 1986	Permit #: 123294	



COMPANY Hoover, Lonny R.
 FARM Dickerson, Stacy
 DATE DRILLED May 15, 1986 NO.
 ELEVATION 0 COUNTY NO. 28125
 LOCATION 3260'N line, 1990'W line of SE NW
 LATITUDE 42.458900 LONGITUDE - 87.813089
 COUNTY Lake API 120972812500 15 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		77
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover Water Well Servic
 FARM Clark C N
 DATE DRILLED January 1, 1971 NO.
 ELEVATION 0 COUNTY NO. 03077
 LOCATION 750'S line, 750'E line of SE NW
 LATITUDE 42.466349 LONGITUDE - 87.818349
 COUNTY Lake API 120970307700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		61
Driller's Log filed		



Permit Date: Permit #: 0

COMPANY Hoover, L. R.
 FARM Conde R
 DATE DRILLED April 1, 1975 NO.
 ELEVATION 0 COUNTY NO. 24431
 LOCATION 700'S line, 1300'E line of NW
 LATITUDE 42.466223 LONGITUDE - 87.820395
 COUNTY Lake API 120972443100

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		147
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover, L. R.
 FARM Martin Glen
 DATE DRILLED September 1, 1971 NO.
 ELEVATION 0 COUNTY NO. 03357
 LOCATION 990'S line, 990'E line of NW
 LATITUDE 42.467014 LONGITUDE - 87.819240
 COUNTY Lake API 120970335700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
yellow clay	0	16
blue clay & gravel	16	51
coarse sand	51	56
Total Depth		56
Casing: 4" GALV STEEL 11# from 0' to 54'		
Screen: 4' of 4" diameter 15 slot		
Size hole below casing: 4"		
Water from coarse sand at 51' to 56'.		
Static level 16' below casing top which is 1' above GL		
Pumping level 18' when pumping at 0 gpm for 0 hours		
Permanent pump installed at 20' on , with a capacity of 0 gpm		
Address of well: 9714 W. 16th St.		
Location source: Location from permit		
Permit Date: January 17, 1989		Permit #: 008843



COMPANY Gross, Michael
 FARM Conde, Ron
 DATE DRILLED February 10, 1989 NO.
 ELEVATION 0 COUNTY NO. 31926
 LOCATION NW SE NW
 LATITUDE 42.467009 LONGITUDE - 87.819226
 COUNTY Lake API 120973192600

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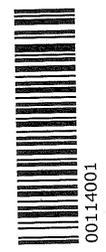
Private Water Well	Top	Bottom
top soil	0	2
sand	2	9
blue	9	37
gravel	37	39
blue	39	64
gravel-sand	64	67
blue-hardpan	67	82
gravel coarse	82	89
Total Depth		89
Casing: 5" PVC from 0' to 87'		
Screen: 3' of 5" diameter 10 slot		
Size hole below casing: 5"		
Water from gravel at 82' to 89'.		
Static level 35' below casing top which is 1' above GL		
Pumping level 0' when pumping at 10 gpm for 0 hours		
Permanent pump installed at 60' on April 3, 1979, with a capacity of 10 gpm		
Address of well: 1511 Park		
Location source: Location from permit		
Permit Date: February 22, 1979		
Permit #: 83609		



COMPANY Gaffke, George E.
 FARM Barclay, Mary
 DATE DRILLED April 2, 1979 NO.
 ELEVATION 0 COUNTY NO. 33747
 LOCATION 125'N line, 100'W line of NE SW NW
 LATITUDE 42.467594 LONGITUDE - 87.822519
 COUNTY Lake API 120973374700

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Private Water Well	Top	Bottom
top soil	0	1
sand & clay	1	8
blue hardpan	8	95
blue clay	95	105
hardpan	105	115
gravel	115	116
Total Depth		116
Casing: 4" GALV 11# from 0' to 116'		
Size hole below casing: 4"		
Water from gravel at 115' to 116'.		
Static level 45' below casing top which is 1' above GL		
Pumping level 45' when pumping at 11 gpm for 0 hours		
Permanent pump installed at 63' on , with a capacity of 0 gpm		
Location source: Location from permit		
Permit Date: March 29, 1977		
Permit #: 58329		



COMPANY Gross, Emil E.
 FARM Martin, Glen
 DATE DRILLED April 5, 1977 NO.
 ELEVATION 0 COUNTY NO. 33749
 LOCATION 150'N line, 10'W line of SW NE NW
 LATITUDE 42.469325 LONGITUDE - 87.820399
 COUNTY Lake API 120973374900

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Water Well	Top	Bottom
sand	0	7
sand & gravel	7	33
sandy blue clay	33	90
soft blue clay	90	111
gravel, some water	111	120
gravel, water	120	123
Total Depth		123
Casing: 5" GALV T&C 14.81 from 0' to 123'		
Size hole below casing: 5"		
Water from gravel at 120' to 123'.		
Static level 18' below casing top which is 1' above GL		
Pumping level 24' when pumping at 20 gpm for 0 hours		
Permanent pump installed at 42' on , with a capacity of 8 gpm		
Driller's Log filed		
Location source: Platbook verified		
Permit Date: June 11, 1969		Permit #: 7646



COMPANY Hoover Water Well Servic
 FARM Sills, Grace
 DATE DRILLED July 3, 1969 NO.
 ELEVATION 0 COUNTY NO. 02911
 LOCATION 1500'N 1500'E SW/c
 LATITUDE 42.461064 LONGITUDE - 87.800178
 COUNTY Lake API 120970291100

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Water Well	Top	Bottom
sand	0	35
hardpan	35	81
blue clay	81	128
limestone	128	180
Total Depth		180
Casing: 5" GALV T&C 14.81 from 0' to 128'		
Size hole below casing: 5"		
Water from limestone at 128' to 180'.		
Static level 14' below casing top which is 1' above GL		
Pumping level 180' when pumping at 3 gpm for 0 hours		
Permanent pump installed at 168' on , with a capacity of 8 gpm		
Driller's Log filed		
Location source: Location from permit		
Permit Date:	Permit #: 6287	



COMPANY Hoover Water Well Servic
FARM Jenko, Wm.
DATE DRILLED November 15, 1968 **NO. 1**
ELEVATION 0 **COUNTY NO.** 02795
LOCATION 1800'N 1200'E SW/c
LATITUDE 42.461897 **LONGITUDE** - 87.801296
COUNTY Lake **API** 120970279500

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
sand	0	33
blue clay	33	46
very sandy clay	46	57
hard, dry clay	57	70
sand (dead)	70	86
soft blue clay	86	99
gravel	99	100
limestone	100	125
Total Depth		125

Casing: 5" GALV T&C 14.81 PPF from 0' to 100'

Size hole below casing: 5"

Water from limestone at 100' to 125'.

Static level 20' below casing top which is 1' above GL

Pumping level 25' when pumping at 30 gpm for 0 hours

Driller's Log filed

Location source: Location from permit

Permit Date: Permit #: 8087



COMPANY Hoover Water Well Servic

FARM Copen, Rudy

DATE DRILLED November 21, 1969 NO.

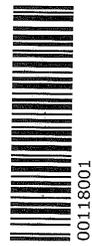
ELEVATION 0 COUNTY NO. 02993

LOCATION 700'S line, 1000'W line of SW

LATITUDE 42.458872 LONGITUDE - 87.802031

COUNTY Lake API 120970299300 14 - 46N - 12E

Private Water Well	Top	Bottom
top soil	0	2
brown	2	9
blue clay	9	99
gravel	99	104
Total Depth		104
Casing: 5" PVC from -2' to 99'		
Screen: 3' of 5" diameter 10 slot		
Size hole below casing: 5"		
Water from gravel at 99' to 104'.		
Static level 76' below casing top which is 1' above GL		
Pumping level 0' when pumping at 10 gpm for 0 hours		
Permanent pump installed at 96' on October 15, 1979, with a capacity of 10 gpm		
Additional Lot 5, North Shore Lands subdivision. location info:		
Location source: Location from permit		
Permit Date: September 10, 1979		Permit #: 89547



COMPANY Gaffke, George E.
 FARM Progressive Builders
 DATE DRILLED September 27, 1979 NO.
 ELEVATION 0 COUNTY NO. 33746
 LOCATION 125'N line, 50'E line of NW SW SW
 LATITUDE 42.460237 LONGITUDE - 87.804957
 COUNTY Lake API 120973374600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		225
Driller's Log filed		
Permit Date:	Permit #: 0	



COMPANY Hoover Water Well Servic
 FARM Buese E C
 DATE DRILLED February 1, 1968 NO. 1
 ELEVATION 0 COUNTY NO. 02454
 LOCATION 1000'S line, 1600'W line of section
 LATITUDE 42.439882 LONGITUDE - 87.831458
 COUNTY Lake API 120970245400

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
gravel	0	10
yellow clay	10	15
hardpan	15	142
limestone	142	156
Total Depth		156
Casing: 4" GALV STEEL from 0' to 142'		
Size hole below casing: 4"		
Water from limestone at 142' to 156'.		
Static level 112' below casing top which is 1' above GL		
Pumping level 112' when pumping at 9 gpm for 0 hours		
Permanent pump installed at 130' on , with a capacity of 10 gpm		
Location source: Location from permit		
Permit Date: October 3, 1979		Permit #: 89978



COMPANY Gross, Emil E.
 FARM Miesner, Don
 DATE DRILLED October 5, 1979 NO.
 ELEVATION 0 COUNTY NO. 33862
 LOCATION 75'N line, 200'E line of NW NE SE
 LATITUDE 42.435156 LONGITUDE - 87.828712
 COUNTY Lake API 120973386200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		146
Driller's Log filed		



Permit Date:

Permit #: 0

COMPANY Hoover Water Well Servic
 FARM Michael Lester Mrs
 DATE DRILLED December 1, 1968 NO. 1
 ELEVATION 0 COUNTY NO. 02803
 LOCATION 750'S line, 300'E line of SE
 LATITUDE 42.430151 LONGITUDE - 87.826683
 COUNTY Lake API 120970280300

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown clay	0	10
blue clay-mxd gravel	10	151
limestone	151	195
Total Depth		195
Casing: 5" PVC from -1' to 131' 5" BLACK STEEL from 131' to 152'		
Size hole below casing: 5"		
Water from limestone at 151' to 195'.		
Static level 93' below casing top which is 1' above GL		
Pumping level 0' when pumping at 12 gpm for 0 hours		
Permanent pump installed at 120' on June 4, 1979, with a capacity of 10 gpm		
Address of well: on Wadsworth		
Location source: Location from permit		
Permit Date: May 22, 1979		Permit #: 85874



COMPANY Gaffke, George E.
 FARM Middleton, Jim
 DATE DRILLED May 25, 1979 NO.
 ELEVATION 0 COUNTY NO. 33861
 LOCATION 75'N line, 50'E line of SE SE SE
 LATITUDE 42.429689 LONGITUDE - 87.825757
 COUNTY Lake API 120973386100

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
top soil	0	2
yellow clay & sand	2	18
blue clay	18	74
hardpan	74	143
rubble	143	146
limestone	146	163
Total Depth		163
Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 146'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 146' to 163'.		
Static level 130' below casing top which is 1' above GL		
Pumping level 140' when pumping at 8 gpm for 2 hours		
Permanent pump installed at 155' on April 12, 1989, with a capacity of 8 gpm		
Additional location info: Lot #10, F. H. Bartletts subdivision. Block #4		
Location source: Location from permit		
Permit Date: April 5, 1989		Permit #: 010329



COMPANY Boyce, Kenneth D.
 FARM Smith, Victor
 DATE DRILLED April 12, 1989 NO.
 ELEVATION 0 COUNTY NO. 36004
 LOCATION NE SE SE
 LATITUDE 42.430811 LONGITUDE - 87.826778
 COUNTY Lake API 120973600400

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Private Water Well	Top	Bottom
clay	0	10
sand	10	80
clay & sand	80	160
rock	160	187
Total Depth		187
Casing: 5" 15# STEEL from 0' to 160'		
Size hole below casing: 5"		
Water from at 120' to 187'.		
Static level 120' below casing top which is 1' above GL		
Pumping level 130' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 160' on July 25, 1991, with a capacity of 10 gpm		
Additional location info: Lot #7, PHB Sheridan Rd. Pk. subdivision. 1st Addition		
Location source: Location from permit		
Permit Date: July 12, 1991	Permit #:	



COMPANY Gross, Eugene J.
 FARM Edwards, Vivian
 DATE DRILLED July 19, 1991
 ELEVATION 0
 LOCATION NE SE SE
 LATITUDE 42.430811
 COUNTY Lake

NO.
 COUNTY NO. 36295
 LONGITUDE - 87.826778
 API 120973629500

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		198
Driller's Log filed		
Permit Date:	Permit #:	0



00130001

COMPANY Boysen, Henry, Jr.
FARM Busch & Larson
DATE DRILLED November 1, 1976 NO.
ELEVATION 0 COUNTY NO. 25067
LOCATION 100'N line, 75'W line of NW NE SE
LATITUDE 42.435096 LONGITUDE - 87.830119
COUNTY Lake API 120972506700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
yellow clay	0	14
stoney gray clay	14	25
gray clay	25	64
stoney gray clay	64	107
soft gray clay	107	121
limestone gravel	121	122
limestone	122	220
Total Depth		220
Casing: 5" GALV T&C 14.81#/FT from 0' to 122'		
Size hole below casing: 5"		
Water from limestone at 122' to 220'.		
Static level 95' below casing top which is 1' above GL		
Pumping level 175' when pumping at 4 gpm for 0 hours		
Driller's Log filed		
Location source: Location from permit		
Permit Date: September 25, 1974		Permit #: 33348



COMPANY Hoover, L. R.
 FARM Khayat, H.
 DATE DRILLED December 5, 1975 NO.
 ELEVATION 0 COUNTY NO. 24432
 LOCATION 300'S line, 275'E line of SE
 LATITUDE 42.428910 LONGITUDE - 87.826599
 COUNTY Lake API 120972443200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay	0	20
sand & clay	20	105
clay	105	145
rock	145	165
Total Depth		165
Casing: 5" STEEL 15#/FT from 0' to 145'		
Grout: BENTONITE CHIPS from 0 to 20.		
Size hole below casing: 5"		
Water from rock at 145' to 165'.		
Static level 120' below casing top which is 1' above GL		
Pumping level 125' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 140' on July 29, 1994, with a capacity of 10 gpm		
Additional location info: Lot #6, Sheridan Rd. Park subdivision. Block #23		
Location source: Location from permit		
Permit Date: June 22, 1994	Permit #:	



COMPANY Gross, Eugene J.
 FARM May, Robert
 DATE DRILLED July 20, 1994
 ELEVATION 0
 LOCATION SE SE SE
 LATITUDE 42.428995
 COUNTY Lake

NO.
 COUNTY NO. 38419
 LONGITUDE - 87.826790
 API 120973841900

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
sand	0	28
sand & clay	28	130
clay	130	155
gravel	155	159
Total Depth		159
Casing: 5" STEEL 15# from 0' to 159'		
Grout: SLURRY from 0 to 16.		
Size hole below casing: 5"		
Water from gravel at 0' to 159'.		
Static level 100' below casing top which is 1' above GL		
Pumping level 110' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 140' on August 14, 1992, with a capacity of 10 gpm		
Additional Location info: Lot #16, B. Sheridan Rd. Park subdivision.		
Address of well: 10076 Wadsworth Rd. Beach Park, IL		
Location source: Location from permit		
Permit Date: August 3, 1992		Permit #:



COMPANY Gross, Eugene J.
 FARM Walldan, Scott
 DATE DRILLED August 10, 1992 NO.
 ELEVATION 0 COUNTY NO. 37098
 LOCATION SE SE SE
 LATITUDE 42.428995 LONGITUDE - 87.826790
 COUNTY Lake API 120973709800

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Noncommunity - Public Water Well	Top	Bottom
Total Depth		



Permit Date: Permit #:

COMPANY
 FARM Extra Value Liquors
 DATE DRILLED NO.
 ELEVATION 0 COUNTY NO. 45167
 LOCATION SE SE SE
 LATITUDE 42.428995 LONGITUDE - 87.826790
 COUNTY Lake API 120974516700 28 - 46N - 12E

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Noncommunity - Public Water Well	Top	Bottom
Total Depth		

Permit Date: Permit #:

COMPANY
 FARM Al's Tap
 DATE DRILLED
 ELEVATION 0
 LOCATION SE SE SE
 LATITUDE 42.428995
 COUNTY Lake

NO.
 COUNTY NO. 45166
 LONGITUDE - 87.826790
 API 120974516600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		152
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover Water Well Servic
 FARM Peterson Parker
 DATE DRILLED February 1, 1977 NO.
 ELEVATION 0 COUNTY NO. 25159
 LOCATION 500'S line, 200'E line of SE NW SE
 LATITUDE 42.433126 LONGITUDE - 87.831157
 COUNTY Lake API 120972515900

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Water Well	Top	Bottom
Total Depth		165
Driller's Log filed		
Permit Date:	Permit #:	0

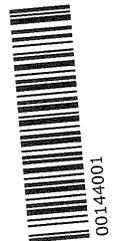


COMPANY Hoover Water Well Servic
FARM Lotz Charles
DATE DRILLED January 1, 1971 NO.
ELEVATION 0 COUNTY NO. 03079
LOCATION 600'N line, 1500'E line of SE
LATITUDE 42.433726 LONGITUDE - 87.831123
COUNTY Lake API 120970307900

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		65
Driller's Log filed		



Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic
 FARM Mason Charles T
 DATE DRILLED May 1, 1971 NO.
 ELEVATION 0 COUNTY NO. 03281
 LOCATION 1100'N line, 1100'W line of SE
 LATITUDE 42.432350 LONGITUDE - 87.831191
 COUNTY Lake API 120970328100

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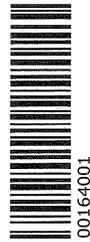
Water Well	Top	Bottom
Total Depth		185
Driller's Log filed		
Permit Date:	Permit #:	0

COMPANY Hoover Water Well Servic
 FARM Fortner J
 DATE DRILLED January 1, 1963 NO.
 ELEVATION 650GL COUNTY NO. 02623
 LOCATION NE NW SE
 LATITUDE 42.434474 LONGITUDE - 87.831618
 COUNTY Lake API 120970262300



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Private Water Well	Top	Bottom
fill & black dirt	0	2
sand	2	8
yellow clay & sand	8	20
blue clay	20	50
medium gravel sand	50	51
hardpan	51	150
limestone	150	215
Total Depth		215
Casing: 5" ASTM A120 T/C 15#/FT from 0' to 150'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 150' to 215'.		
Static level 110' below casing top which is 1' above GL		
Pumping level 150' when pumping at 2 gpm for 3 hours		
Permanent pump installed at 200' on February 9, 1987, with a capacity of 4 gpm		
Additional location info: Lot 3, Sheridan Road Park subdivision. 1st Addition, Block #8		
Location source: Field verified		
Permit Date: February 4, 1987		Permit #: 129319

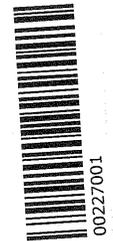


COMPANY Boyce, Kenneth D.
 FARM Smith, Victor
 DATE DRILLED February 9, 1987 NO.
 ELEVATION 0 COUNTY NO. 29070
 LOCATION 2400'S line, 1620'E line of section
 LATITUDE 42.434735 LONGITUDE - 87.831563
 COUNTY Lake API 120972907000

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
sandy clay	0	11
sand & gravel	11	27
blue clay, hardpan, & boulders	27	158
gravel	158	160
limestone	160	190
Total Depth		190
Casing: 5" STEEL from 0' to 160'		
Grout: BENT/#8 MESH from 0 to 11.		
Water from limestone at 160' to 190'.		
Static level 137' below casing top which is 1' above GL		
Pumping level 170' when pumping at 7 gpm for 0 hours		
Permanent pump installed at 180' on , with a capacity of 0 gpm		
Additional location info: Lot #3, Sheridan Rd. Park subdivision. Block#12		
Location source: Location from permit		
Permit Date: June 21, 1994	Permit #:	



COMPANY Gross, Michael
 FARM Reinhardt, Gary
 DATE DRILLED July 6, 1994
 ELEVATION 0
 LOCATION NE NW SE
 LATITUDE 42.434474
 COUNTY Lake

NO.
 COUNTY NO. 38345
 LONGITUDE - 87.831618
 API 120973834500

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
limestone	0	269
Total Depth		269
Size hole below casing: 5"		
Water from limestone at 225' to 269'.		
Static level 165' below casing top which is 1' above GL		
Pumping level 268' when pumping at 2 gpm for 3 hours		
Permanent pump installed at 268' on June 26, 1992, with a capacity of 5 gpm		
Additional location info: Lot #3, B. Sheridan Rd. Park subdivision. 1st Addition		
Location source: Location from permit		
Permit Date: June 3, 1992	Permit #:	



COMPANY Boyce, Kenneth D.
 FARM Petherline, Sheila
 DATE DRILLED June 25, 1992
 ELEVATION 0
 LOCATION NE NW SE
 LATITUDE 42.434474
 COUNTY Lake

NO.
 COUNTY NO. 37096

LONGITUDE - 87.831618
 API 120973709600

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Water Well	Top	Bottom
Total Depth		176
Driller's Log filed		
Permit Date:	Permit #: 0	



COMPANY Hoover Water Well Servic
 FARM Paslowsky Mike
 DATE DRILLED January 1, 1963 NO.
 ELEVATION 639GL COUNTY NO. 02625
 LOCATION SE SW SE
 LATITUDE 42.429031 LONGITUDE - 87.831656
 COUNTY Lake API 120970262500

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
yellow clay	0	20
blue clay	20	60
hardpan	60	135
lime ledge	135	140
limestone	140	174
Total Depth		174
Casing: 5" GALV WELL from 0' to 140'		
Size hole below casing: 5"		
Water from limestone at 140' to 174'.		
Static level 110' below casing top which is 1' above GL		
Pumping level 110' when pumping at 5 gpm for 0 hours		
Permanent pump installed at 165' on , with a capacity of 0 gpm		
Location source: Location from permit		
Permit Date: December 11, 1985		Permit #: 121770



COMPANY Gross, Michael
 FARM Khayat, Helen
 DATE DRILLED March 13, 1986 NO.
 ELEVATION 0 COUNTY NO. 27858
 LOCATION 150'N line, 100'E line of SE SW SE
 LATITUDE 42.429518 LONGITUDE - 87.830808
 COUNTY Lake API 120972785800

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Private Water Well	Top	Bottom
top soil	0	2
yellow clay	2	9
gravel & sand	9	12
blue clay	12	30
gravel	30	34
blue clay	34	56
gravel & sand	56	61
blue clay	61	97
gravel & sand	97	103
hardpan	103	149
rubble	149	164
limestone	164	180
Total Depth		180
Casing: 5" ASTM A-53 T/C 15#/FT from 0' to 164'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 164' to 180'.		
Static level 128' below casing top which is 1' above GL		
Pumping level 165' when pumping at 8 gpm for 2 hours		
Permanent pump installed at 178' on August 6, 1993, with a capacity of 8 gpm		
Additional location info: Lot #1, Sheridan Rd. Park subdivision. 1st Addition		
Address of well: 10279 Ames Ave. Beach Park, IL		
Permit Date: July 7, 1993		Permit #:

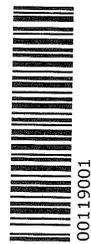


COMPANY Boyce, Kenneth D.
 FARM Galgan, Bruce & Chris
 DATE DRILLED August 5, 1993 NO.
 ELEVATION 0 COUNTY NO. 37741
 LOCATION SE SW SE
 LATITUDE 42.429031 LONGITUDE - 87.831656
 COUNTY Lake API 120973774100

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		144
Driller's Log filed		
Permit Date:	Permit #: 0	

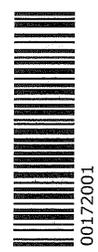


COMPANY Hoover Water Well Servic
 FARM Lotz Const
 DATE DRILLED June 1, 1970 NO.
 ELEVATION 0 COUNTY NO. 01450
 LOCATION 1000'N line, 500'E line of SE
 LATITUDE 42.432601 LONGITUDE - 87.827410
 COUNTY Lake API 120970145000

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
top soil	0	2
sand	2	19
blue clay	19	33
hardpan	33	95
gravel	95	98
hardpan	98	114
blue clay	114	118
rubble	118	121
limestone	121	150
Total Depth		150
Casing: 5" ASTM A-120 T/C 15# from 0' to 121'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 121' to 150'.		
Static level 105' below casing top which is 1' above GL		
Pumping level 105' when pumping at 10 gpm for 2 hours		
Permanent pump installed at 145' on June 16, 1987, with a capacity of 10 gpm		
Additional location info: Lot 4, Sharon Park 2 subdivision. Block #1		
Location source: Location from permit		
Permit Date: April 23, 1987		Permit #: 131114



COMPANY Boyce, Kenneth D.
 FARM Dugan, Mike
 DATE DRILLED June 16, 1987 NO.
 ELEVATION 0 COUNTY NO. 29422
 LOCATION NE SE
 LATITUDE 42.433543 LONGITUDE - 87.827978
 COUNTY Lake API 120972942200 28 - 46N - 12E

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Private Water Well	Top	Bottom
gvl, sand, clay mix	0	8
yellow clay	8	15
blue clay	15	50
hardpan	50	140
limestone	140	142
Total Depth		142
Casing: 4" GALV STEEL #11 from 0' to 140'		
Size hole below casing: 4"		
Water from limestone at 140' to 142'.		
Static level 112' below casing top which is 1' above GL		
Pumping level 125' when pumping at 9 gpm for 0 hours		
Additional Lot 7, subdivision.		
location info:		
Location source: Location from permit		
Permit Date: June 17, 1980		Permit #: 94391



COMPANY Gross, Emil E.
 FARM Ernstmeyer, David
 DATE DRILLED August 12, 1980 NO. 7
 ELEVATION 0 COUNTY NO. 33854
 LOCATION 200'N line, 200'E line of SW NE SE
 LATITUDE 42.432997 LONGITUDE - 87.828724
 COUNTY Lake API 120973385400

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Private Water Well	Top	Bottom
clay	0	10
clay & sand	10	38
gravel	38	43
Total Depth		43
Casing: 5" STEEL 11# from 0' to 0'		
Screen: 4' of 4" diameter 20 slot		
Size hole below casing: 4"		
Water from at 43' to 0'.		
Static level 20' below casing top which is 1' above GL		
Pumping level 30' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 40' on September 21, 1990, with a capacity of 10 gpm		
Additional location info: Lot #8, F.H. Bartletts subdivision.		
Address of well: 39307 Emmaus		
Location source: Location from permit		
Permit Date: July 9, 1990		
Permit #:		



COMPANY Gross, Eugene J.
 FARM Dickerson, Stacy
 DATE DRILLED September 20, 1990 NO.
 ELEVATION 0 COUNTY NO. 35996
 LOCATION SW NE SE
 LATITUDE 42.432642 LONGITUDE - 87.829198
 COUNTY Lake API 120973599600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
yellow clay	0	10
blue clay sand	10	100
clay	100	146
rock	146	180
Total Depth		180
Casing: 5" STEEL #15 from 0' to 146'		
Size hole below casing: 5"		
Water from rock at 140' to 170'.		
Static level 140' below casing top which is 1' above GL		
Pumping level 156' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 170' on June 10, 1991, with a capacity of 10 gpm		
Address of well: 39025 Holdridge Ave. Beach Park, IL		
Location source: Location from permit		
Permit Date: May 23, 1991		
Permit #:		



COMPANY Gross, Eugene J.
 FARM Dalke, Perry
 DATE DRILLED June 1, 1991
 ELEVATION 0
 LOCATION NE NE SE
 LATITUDE 42.434444
 COUNTY Lake

NO.
 COUNTY NO. 36294
 LONGITUDE - 87.826758
 API 120973629400

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Private Water Well	Top	Bottom
black dirt	0	2
yellow clay & sand	2	20
blue clay	20	52
medium gravel sand	52	54
hardpan	54	175
blue clay	175	184
hardpan	184	187
rubble	187	189
limestone	189	225
Total Depth		225
Casing: 5" ASTM A120 T/C 15#/FT from 0' to 189'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 189' to 225'.		
Static level 115' below casing top which is 1' above GL		
Pumping level 185' when pumping at 2 gpm for 2 hours		
Permanent pump installed at 225' on October 8, 1986, with a capacity of 4 gpm		
Additional Location Lot 3, Bartlett's Rd. Park subdivision.		
Location info:		
Location source: Location from permit		
Permit Date: August 26, 1986		
Permit #: 126327		



COMPANY Boyce, Kenneth D.
 FARM Middleton, Robert
 DATE DRILLED October 7, 1986 NO.
 ELEVATION 0 COUNTY NO. 28546
 LOCATION SE
 LATITUDE 42.431744 LONGITUDE - 87.830421
 COUNTY Lake API 120972854600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
sand	0	65
sand & clay	65	120
gravel & clay	120	140
gravel	140	155
Total Depth		155
Casing: 4" GALV #11 from 0' to 0'		
Size hole below casing: 4"		
Water from gravel at 140' to 155'.		
Static level 125' below casing top which is 1' above GL		
Pumping level 130' when pumping at 5 gpm for 2 hours		
Permanent pump installed at 140' on , with a capacity of 10 gpm		
Additional location info: Lot 8, Sheridan Road Park subdivision. 1st Addition, Block #18		
Location source: Location from permit		
Permit Date: June 2, 1976		Permit #: 47875



COMPANY Gross, Eugene J.
 FARM Humphres, R. L.
 DATE DRILLED June 28, 1976
 ELEVATION 0
 LOCATION SE
 LATITUDE 42.431744
 COUNTY Lake

NO.
COUNTY NO. 33858

LONGITUDE - 87.830421
API 120973385800

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Private Water Well	Top	Bottom
black dirt	0	1
yellow clay	1	31
blue clay	31	91
sand	91	120
clay	120	170
Total Depth		170
Casing: 4" GALV 11# from 0' to 170'		
Size hole below casing: 0"		
Water from gravel at 160' to 170'.		
Static level 1' below casing top which is 1' above GL		
Pumping level 110' when pumping at 10 gpm for 1 hour		
Permanent pump installed at 146' on November 12, 1980, with a capacity of 10 gpm		
Additional location info: Lot 3, Sheridan Rd. Park subdivision. Block #25		
Location source: Location from permit		
Permit Date: September 29, 1980		
Permit #: 96352		



COMPANY Gross, Eugene J.
 FARM Michelsen, Carl
 DATE DRILLED November 15, 1980 NO.
 ELEVATION 0 COUNTY NO. 33860
 LOCATION SE
 LATITUDE 42.431744 LONGITUDE - 87.830421
 COUNTY Lake API 120973386000

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Private Water Well	Top	Bottom
brown clay	0	10
blue clay	10	110
hardpan	110	160
rock	160	166
Total Depth		166
Casing: 4" GALV #11 from 0' to 0'		
Size hole below casing: 4"		
Water from rock at 160' to 166'.		
Static level 100' below casing top which is 1' above GL		
Pumping level 120' when pumping at 10 gpm for 2 hours		
Permanent pump installed at 126' on , with a capacity of 10 gpm		
Additional location info: Lot 2, Sheridan Road Park subdivision. Block #16		
Location source: Location from permit		
Permit Date: February 10, 1975		
Permit #: 36001		

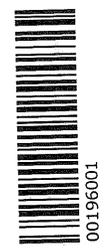


COMPANY Gross, Eugene J.
FARM Pitcher Construction
DATE DRILLED June 16, 1975 **NO.**
ELEVATION 0 **COUNTY NO.** 33866
LOCATION SE
LATITUDE 42.431744 **LONGITUDE** - 87.830421
COUNTY Lake **API** 120973386600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
sand	0	20
sand & clay	20	120
clay	120	162
rock	162	169
Total Depth		169
Casing: 4" GALV #11 from 0' to 0'		
Size hole below casing: 4"		
Water from rock at 162' to 169'.		
Static level 100' below casing top which is 1' above GL		
Pumping level 100' when pumping at 10 gpm for 2 hours		
Permanent pump installed at 126' on , with a capacity of 10 gpm		
Additional location info: Lot 5, Sheridan Road Park subdivision. Block #14		
Address of well: Illinois & Garnett		
Location source: Location from permit		
Permit Date: July 27, 1976		Permit #: 50094



COMPANY Gross, Eugene J.
 FARM Pitcher Construction Co.
 DATE DRILLED October 11, 1976 NO.
 ELEVATION 0 COUNTY NO. 33867
 LOCATION SE
 LATITUDE 42.431744 LONGITUDE - 87.830421
 COUNTY Lake API 120973386700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
top soil & fill	0	2
sand	2	13
yellow clay	13	22
blue clay	22	56
sand	56	60
hardpan	60	122
blue clay	122	142
rubble	142	149
limestone	149	155
Total Depth		155
Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 149'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 149' to 155'.		
Static level 130' below casing top which is 1' above GL		
Pumping level 140' when pumping at 9 gpm for 2 hours		
Permanent pump installed at 150' on November 12, 1990, with a capacity of 8 gpm		
Additional location info: Lot #1, F. H. Bartletts subdivision. 1st Addition		
Location source: Location from permit		
Permit Date: July 3, 1990 Permit #:		



COMPANY Boyce, Kenneth D.
 FARM Lucy's Appliances
 DATE DRILLED November 9, 1990 NO.
 ELEVATION 0 COUNTY NO. 36002
 LOCATION SE
 LATITUDE 42.431744 LONGITUDE - 87.830421
 COUNTY Lake API 120973600200

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Page 1 **ILLINOIS STATE GEOLOGICAL SURVEY**

Private Water Well	Top	Bottom
yellow clay	0	10
hardpan	10	80
blue clay	80	100
hardpan	100	150
gravel	150	155
limestone	155	180
Total Depth		180
Casing: 5" STEEL from 0' to 155'		
Size hole below casing: 0"		
Water from limestone at 0' to 0'.		
Static level 5' below casing top which is 120' above GL		
Pumping level 120' when pumping at 20 gpm for 0 hours		
Permanent pump installed at 180' on , with a capacity of 11 gpm		
Location source: Location from permit		
Permit Date: August 2, 1983		
Permit #: 108530		



COMPANY Gross, Michael
 FARM Wilbanks, Thersa
 DATE DRILLED September 15, 1983 NO.
 ELEVATION 0 COUNTY NO. 33870
 LOCATION 50'S line, 150'W line of NW NE
 LATITUDE 42.439166 LONGITUDE - 87.834666
 COUNTY Lake API 120973387000

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		186
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover, L. R.
 FARM Nikkila Bill
 DATE DRILLED August 1, 1975 NO.
 ELEVATION 0 COUNTY NO. 24485
 LOCATION 300'S line, 950'E line of section
 LATITUDE 42.428930 LONGITUDE - 87.829108
 COUNTY Lake API 120972448500

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		173
Driller's Log filed		
Permit Date:	Permit #:	0



00139001

COMPANY Hoover, L. R.
 FARM Wubbell Herbert
 DATE DRILLED September 1, 1975 NO.
 ELEVATION 0 COUNTY NO. 24592
 LOCATION 150'S line, 800'E line of section
 LATITUDE 42.428512 LONGITUDE - 87.828553
 COUNTY Lake API 120972459200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		176
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover, L. R.
 FARM Ernstmeyer Robt
 DATE DRILLED May 1, 1973 NO.
 ELEVATION 0 COUNTY NO. 03922
 LOCATION 250'S line, 1000'E line of section
 LATITUDE 42.428795 LONGITUDE - 87.829293
 COUNTY Lake API 120970392200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
no record	0	170
drift (sand)	170	175
Total Depth		175
Casing: 4" ASTM T&C 11.13#/FT from 0' to 175'		
Size hole below casing: 4"		
Water from sand at 174' to 175'.		
Static level 140' below casing top which is 1' above GL		
Pumping level 165' when pumping at 12 gpm for 2 hours		
Location source: Location from permit		
Permit Date: June 25, 1985		Permit #: 118622



COMPANY Hoover, Lonny R.
 FARM Kruse, Ken
 DATE DRILLED July 31, 1985 NO.
 ELEVATION 0 COUNTY NO. 27421
 LOCATION SW SE SE
 LATITUDE 42.429012 LONGITUDE - 87.829225
 COUNTY Lake API 120972742100

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Private Water Well	Top	Bottom
brown clay	0	8
brown sand	8	13
blue clay	13	40
gravel	40	42
blue clay	42	49
sand	49	54
blue clay	54	132
broken rock	132	134
limestone	134	136
broken rock sand	136	137
limestone	137	194
Total Depth		194
Casing: 5" PVC from 0' to 115' 5" BLACK STEEL from 116' to 136'		
Size hole below casing: 5"		
Water from limestone at 137' to 194'.		
Static level 86' below casing top which is 0' above GL		
Pumping level 0' when pumping at 10 gpm for 0 hours		
Permanent pump installed at 120' on April 10, 1986, with a capacity of 15 gpm		
Address of well: 10323 California		
Location source: Location from permit		
Permit Date: February 19, 1986 Permit #: 122314		

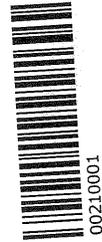


COMPANY Gaffke, George E.
 FARM Brooks Builders
 DATE DRILLED April 1, 1986 NO.
 ELEVATION 0 COUNTY NO. 27949
 LOCATION 150'S line, 25'W line of SE SE
 LATITUDE 42.428529 LONGITUDE - 87.830349
 COUNTY Lake API 120972794900

28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
fill & black dirt	0	2
sand & yellow clay	2	21
blue clay	21	40
hardpan	40	89
mealy sand	89	95
hardpan	95	151
limestone, gravel	151	154
limestone	154	168
Total Depth		168
Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 154'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 154' to 168'.		
Static level 125' below casing top which is 1' above GL		
Pumping level 127' when pumping at 10 gpm for 2 hours		
Permanent pump installed at 165' on April 30, 1990, with a capacity of 8 gpm		
Additional location info: Lot #5, Sheridan Rd. Park subdivision.		
Address of well: 10177 W. Wadsworth Rd.		
Location source: Location from permit		
Permit Date: October 13, 1989		Permit #: 015212



COMPANY Boyce, Kenneth D.
 FARM Khavat, Helena
 DATE DRILLED April 27, 1990 NO.
 ELEVATION 0 COUNTY NO. 35999
 LOCATION SW SE SE
 LATITUDE 42.429012 LONGITUDE - 87.829225
 COUNTY Lake API 120973599900

28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		160
Driller's Log filed		



Permit Date: Permit #: 0

COMPANY Hoover, L. R.
 FARM Rea Bo
 DATE DRILLED August 1, 1978 NO.
 ELEVATION 0 COUNTY NO. 26713
 LOCATION 300'N line, 275'E line of NW NW SE
 LATITUDE 42.434571 LONGITUDE - 87.833854
 COUNTY Lake API 120972671300

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Private Water Well	Top	Bottom
sandy clay	0	80
clay & gravel	80	120
clay	120	168
rock	168	175
Total Depth		175
Casing: 5" STEEL 15# from 0' to 168'		
Grout: SLER from 0 to 18.		
Size hole below casing: 5"		
Static level 110' below casing top which is 1' above GL		
Pumping level 120' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 168' on November 1, 1993, with a capacity of 7 gpm		
Additional location info: Lot #3, Sheridan Rd. subdivision.		
Address of well: 10433 Illinois Ave. Beach Park, IL		
Location source: Location from permit		
Permit Date: September 27, 1993	Permit #:	



COMPANY Gross, Eugene J.
 FARM Mosley, Reggie
 DATE DRILLED October 15, 1993 NO.
 ELEVATION 0 COUNTY NO. 37885
 LOCATION NW NW SE
 LATITUDE 42.434491 LONGITUDE - 87.834046
 COUNTY Lake API 120973788500

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
clay & sand	0	60
clay	60	105
clay & sand	105	150
sand & gravel	150	170
Total Depth		170
Casing: 5" STEEL 15# from 0' to 168'		
Screen: 4' of 4" diameter 20 slot		
Grout: SLER from 0 to 18.		
Size hole below casing: 4"		
Water from gravel at 168' to 170'.		
Static level 120' below casing top which is 1' above GL		
Pumping level 130' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 165' on July 6, 1993, with a capacity of 10 gpm		
Additional Lot #6, Sheridan Rd. Park subdivision.		
Location info:		
Location source: Location from permit		
Permit Date: June 22, 1993	Permit #:	



COMPANY Gross, Eugene J.
 FARM Binning, Helen
 DATE DRILLED July 2, 1993
 ELEVATION 0
 LOCATION NW NW SE
 LATITUDE 42.434491
 COUNTY Lake

NO.
 COUNTY NO. 37740
 LONGITUDE - 87.834046
 API 120973774000

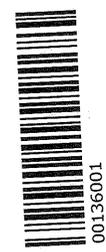
28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		167
Driller's Log filed		
Permit Date:	Permit #:	0

COMPANY Hoover, L. R.
FARM Carman Lester
DATE DRILLED April 1, 1977 NO.
ELEVATION 0 COUNTY NO. 25218
LOCATION 100'S line, 250'E line of NE SW SE
LATITUDE 42.430212 LONGITUDE - 87.831363
COUNTY Lake API 120972521800

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
sand & gravel	0	20
hardpan	20	42
mud sand	42	50
hardpan	50	74
mud sand	74	85
blue clay	85	120
blue clay & gravel	120	163
limestone	163	222
Total Depth		222
Casing: 5" GALV STEEL 15# from 0' to 163'		
Size hole below casing: 5"		
Water from limestone at 163' to 222'.		
Static level 110' below casing top which is 1' above GL		
Pumping level 220' when pumping at 1 gpm for 3 hours		
Permanent pump installed at 220' on , with a capacity of 10 gpm		
Address of well: 39317 Garnett		
Location source: Field verified		
Permit Date: February 7, 1986		
Permit #: 122257		



COMPANY Gross, Michael
 FARM Tuovinen, Eija
 DATE DRILLED February 10, 1986 NO.
 ELEVATION 0 COUNTY NO. 27931
 LOCATION 920'S line, 1890'E line of section
 LATITUDE 42.430667 LONGITUDE - 87.832590
 COUNTY Lake API 120972793100

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Private Water Well	Top	Bottom
clay	0	10
clay & sand	10	90
clay	90	152
rock	152	172
Total Depth		172
Casing: 5" STEEL 15# from 0' to 152'		
Size hole below casing: 5"		
Water from rock at 0' to 172'.		
Static level 110' below casing top which is 2' above GL		
Pumping level 120' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 140' on December 21, 1991, with a capacity of 10 gpm		
Additional Lot #4, FHB Sheridan Rd. subdivision. location info:		
Address of well: 10345 W. Ames Beach Park, IL		
Location source: Location from permit		
Permit Date: November 14, 1991	Permit #:	



COMPANY Gross, Eugene J.
 FARM Binning, Helen
 DATE DRILLED December 17, 1991 NO.
 ELEVATION 0 COUNTY NO. 36482
 LOCATION NE SW SE
 LATITUDE 42.430847 LONGITUDE - 87.831645
 COUNTY Lake API 120973648200

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
no record	0	136
limestone	136	170
Total Depth		170
Size hole below casing: 5"		
Water from limestone at 136' to 170'.		
Static level 134' below casing top which is 1' above GL		
Pumping level 150' when pumping at 0 gpm for 4 hours		
Permanent pump installed at 168' on October 3, 1992, with a capacity of 8 gpm		
Additional location info: Lot #5, E 1/2, Sheridan Rd. Park subdivision. 1st Addition		
Location source: Location from permit		
Permit Date: July 13, 1992	Permit #:	



COMPANY Boyce, Kenneth D.
 FARM Donev, Carol
 DATE DRILLED October 2, 1992 NO.
 ELEVATION 0 COUNTY NO. 37425
 LOCATION NE SW SE
 LATITUDE 42.430847 LONGITUDE - 87.831645
 COUNTY Lake API 120973742500

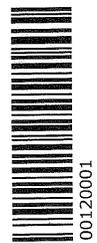
28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
clay	0	4
sandy clay	4	22
gravel & clay	22	28
hardpan	28	70
sand & runny clay	70	81
sandy clay	81	110
hardpan	110	140
hardpan & boulders	140	148
limestone	152	152
gravel	148	152
Total Depth		190

Casing: 4" GALV T&C 10.89 PPF from 0' to 152'
 Size hole below casing: 4"
 Water from limestone at 0' to 152'.
 Static level 80' below casing top which is 1' above GL
 Pumping level 160' when pumping at 2 gpm for 0 hours
 Driller's Log filed
 Location source: Platbook verified

Permit Date: Permit #: NFO7232



COMPANY Hoover Water Well Servic
 FARM Spiegelberg, D.
 DATE DRILLED October 1, 1969 NO.
 ELEVATION 0 COUNTY NO. 03010
 LOCATION 600'N line, 600'W line of SE
 LATITUDE 42.433739 LONGITUDE - 87.833038
 COUNTY Lake API 120970301000

28 - 46N - 12E

Private Water Well	Top	Bottom
fill & black dirt	0	2
sand	2	12
yellow clay & sand	12	22
blue clay	22	60
hardpan	60	161
rubble	161	165
limestone	165	169
Total Depth		169
Casing: 5" ASTM A120 T/C 15#/FT from 0' to 165'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 165' to 169'.		
Static level 121' below casing top which is 1' above GL		
Pumping level 126' when pumping at 12 gpm for 2 hours		
Permanent pump installed at 160' on August 17, 1987, with a capacity of 10 gpm		
Additional location info: Lot 4, Sheridan Road Park subdivision. Block #11		
Location source: Location from permit		
Permit Date: August 13, 1987		Permit #: 134374



COMPANY Boyce, Kenneth D.
 FARM Smith, Victor
 DATE DRILLED August 17, 1987 NO.
 ELEVATION 0 COUNTY NO. 29906
 LOCATION NW SE
 LATITUDE 42.433576 LONGITUDE - 87.832838
 COUNTY Lake API 120972990600

28 - 46N - 12E

Private Water Well	Top	Bottom
black dirt	0	2
yellow clay	2	8
silty sand	8	11
blue clay	11	50
sand	50	55
hardpan	55	110
blue clay	110	141
sand	141	143
hardpan	143	161
gravel	161	164
Total Depth		164
Casing: 5" ASTM A120 T/C 15#/FT from 0' to 161' " from 0' to 0'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from gravel at 161' to 164'.		
Static level 110' below casing top which is 1' above GL		
Pumping level 115' when pumping at 12 gpm for 2 hours		
Permanent pump installed at 160' on July 21, 1985, with a capacity of 8 gpm		
Additional Lot 5, Sheridan Road Park subdivision.		
location info: 1st Addition, Block #17		
Location source: Field verified		
Permit Date: July 11, 1985		Permit #: 118948



COMPANY Boyce, Kenneth D.
 FARM Delaney, Tobey
 DATE DRILLED July 20, 1985 NO.
 ELEVATION 0 COUNTY NO. 27465
 LOCATION 1580'S line, 1890'E line of section
 LATITUDE 42.432485 LONGITUDE - 87.832578
 COUNTY Lake API 120972746500

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Private Water Well	Top	Bottom
clay	0	19
hardpan	19	74
sandy clay	74	90
hardpan	90	125
blue clay	125	163
broken limestone	163	164
limestone	164	196
Total Depth		196
Casing: 5" GALV STEEL from 0' to 164'		
Size hole below casing: 5"		
Water from limestone at 164' to 196'.		
Static level 110' below casing top which is 1' above GL		
Pumping level 170' when pumping at 12 gpm for 0 hours		
Permanent pump installed at 180' on , with a capacity of 10 gpm		
Location source: Location from permit		
Permit Date: November 20, 1987		Permit #: 137600



COMPANY Gross, Michael
 FARM Wolden, James
 DATE DRILLED November 11, 1987 NO.
 ELEVATION 0 COUNTY NO. 30397
 LOCATION SE NW SE
 LATITUDE 42.432662 LONGITUDE - 87.831629
 COUNTY Lake API 120973039700

28 - 46N - 12E

Private Water Well	Top	Bottom
black dirt	0	1
sand	1	13
blue clay	13	45
gravel	45	55
Total Depth		55
Casing: 4" GALV 11# from 0' to 45'		
Screen: 5' of 3" diameter 10 slot		
Size hole below casing: 3"		
Water from gravel at 45' to 50'.		
Static level 20' below casing top which is 1' above GL		
Pumping level 40' when pumping at 15 gpm for 1 hour		
Permanent pump installed at 45' on December 23, 1982, with a capacity of 8 gpm		
Additional location info: Lot 4, Sheridan Rd. Park subdivision.		
Location source: Field verified		
Permit Date: November 17, 1982		Permit #: 105633



COMPANY Gross, Emil E.
 FARM Esperson, Warren
 DATE DRILLED December 23, 1982 NO.
 ELEVATION 0 COUNTY NO. 33855
 LOCATION 1590'S line, 1760'E line of section
 LATITUDE 42.432508 LONGITUDE - 87.832098
 COUNTY Lake API 120973385500

28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
top soil	0	2
sand & gravel	2	17
blue clay	17	25
sand & gravel	25	29
blue clay	29	61
sand & gravel	61	65
hardpan	65	137
blue clay	137	154
rubble	154	161
limestone	161	172
Total Depth		172
Casing: 5" ASTM A53 15#/FT from 0' to 161'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 161' to 172'.		
Static level 120' below casing top which is 1' above GL		
Pumping level 135' when pumping at 9 gpm for 4 hours		
Permanent pump installed at 168' on September 21, 1994, with a capacity of 8 gpm		
Additional location info: Lot #6, Sheridan Rd. Park subdivision. 1st Addition		
Address of well: 10470 W. Chicago Ave.		
Location source: Location from permit		
Permit Date: June 13, 1994 Permit #:		



COMPANY Boyce, Kenneth D.
 FARM Ram Builders
 DATE DRILLED September 20, 1994 NO.
 ELEVATION 0 COUNTY NO. 38624
 LOCATION NW SE
 LATITUDE 42.433576 LONGITUDE - 87.832838
 COUNTY Lake API 120973862400

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
fill & top soil	0	2
yellow clay & sand & stone	2	18
blue clay	18	33
hardpan	33	163
limestone	163	170
Total Depth		170
Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 163'		
Grout: CLAY SLURRY from 0 to 20.		
Water from limestone at 163' to 170'.		
Permanent pump installed at 148' on March 14, 1994, with a capacity of 8 gpm		
Additional location info: Lot #6, Sheridan Rd. Park subdivision. 1st Add.		
Address of well: 10454 Chicago Ave. Beach Park, IL		
Location source: Location from permit		
Permit Date: December 3, 1993		Permit #:



COMPANY Boyce, Kenneth D.
 FARM Ram Builders
 DATE DRILLED March 14, 1994 NO.
 ELEVATION 0 COUNTY NO. 38151
 LOCATION NW SE
 LATITUDE 42.433576 LONGITUDE - 87.832838
 COUNTY Lake API 120973815100 28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

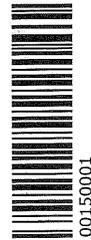
Private Water Well	Top	Bottom
fill	0	3
clay	3	11
gravel	11	22
hardpan & boulders	22	126
blue clay	126	150
gravel	150	152
limestone	152	192
Total Depth		192
Casing: 5" STEEL from 0' to 152'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 152' to 192'.		
Static level 138' below casing top which is 0' above GL		
Pumping level 165' when pumping at 6 gpm for 0 hours		
Permanent pump installed at 180' on , with a capacity of 0 gpm		
Additional location info: Lot #6, B. Sheridan Rd. Park subdivision.		
Address of well: 10218 W. Ames Ave.		
Location source: Location from permit		
Permit Date: April 30, 1992	Permit #:	



COMPANY Gross, Michael
FARM Buttera, Joe
DATE DRILLED May 31, 1992 **NO.**
ELEVATION 0 **COUNTY NO.** 37095
LOCATION SE NW SE
LATITUDE 42.432662 **LONGITUDE** - 87.831629
COUNTY Lake **API** 120973709500 **28 - 46N - 12E**

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		184
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover, L. R.
 FARM English Constr
 DATE DRILLED November 1, 1976 NO.
 ELEVATION 0 COUNTY NO. 24992
 LOCATION 750'S line, 1000'E line of section
 LATITUDE 42.430173 LONGITUDE - 87.829285
 COUNTY Lake API 120972499200

28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		200
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY Hoover, L. R.
 FARM Carman Lester
 DATE DRILLED September 1, 1978 NO.
 ELEVATION 0 COUNTY NO. 26711
 LOCATION 150'S line, 275'W line of NW SE SE
 LATITUDE 42.430337 LONGITUDE - 87.829408
 COUNTY Lake API 120972671100

28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		198
Driller's Log filed		
Permit Date:	Permit #:	0



COMPANY
 FARM Busch & Larson
 DATE DRILLED March 1, 1979 NO.
 ELEVATION 0 COUNTY NO. 26821
 LOCATION 250'N line, 50'W line of SE SE
 LATITUDE 42.431056 LONGITUDE - 87.830241
 COUNTY Lake API 120972682100

28 - 46N - 12E

Private Water Well	Top	Bottom
clay fill	0	1
original top soil	1	2
sandy brown clay	2	12
blue clay	12	30
blue clay & gravel	30	66
blue clay	66	135
gvl & clay-brkn ls	135	156
limestone	156	220
Total Depth		220
Casing: 5" PVC from -1' to 136' 5" BLACK STEEL from 136' to 157'		
Size hole below casing: 5"		
Water from limestone at 156' to 220'.		
Static level 107' below casing top which is 1' above GL		
Pumping level 0' when pumping at 3 gpm for 0 hours		
Permanent pump installed at 180' on March 12, 1985, with a capacity of 10 gpm		
Address of well: 39093 Holdridge		
Location source: Location from permit		
Permit Date: February 27, 1985		Permit #: 116661

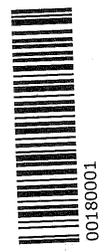


COMPANY Gaffke, George E.
 FARM Larson, Al
 DATE DRILLED March 11, 1985 NO.
 ELEVATION 0 COUNTY NO. 27174
 LOCATION 25'S line, 75'W line of NW SE SE
 LATITUDE 42.429997 LONGITUDE - 87.830156
 COUNTY Lake API 120972717400

28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
brown clay	0	10
blue clay	10	17
sand	17	25
blue clay-lt gravel	25	145
limestone	145	198
Total Depth		198
Casing: 5" PVC from 0' to 125' 5" BLACK from 125' to 146'		
Size hole below casing: 5"		
Water from limestone at 145' to 198'.		
Static level 123' below casing top which is 1' above GL		
Pumping level 0' when pumping at 4 gpm for 0 hours		
Permanent pump installed at 180' on March 16, 1979, with a capacity of 10 gpm		
Address of well: 38163 N. Holdridge		
Location source: Location from permit		
Permit Date: December 5, 1978		Permit #: 82737



COMPANY Gaffke, George E.
 FARM Busch & Larson
 DATE DRILLED March 2, 1979 NO.
 ELEVATION 0 COUNTY NO. 33851
 LOCATION 225'N line, 150'W line of SE SE
 LATITUDE 42.431120 LONGITUDE - 87.829868
 COUNTY Lake API 120973385100 28 - 46N - 12E

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Private Water Well	Top	Bottom
no record	0	140
rock	140	168
Total Depth		168
Casing: 4" STEEL 11# from 0' to 140'		
Size hole below casing: 4"		
Water from rock at 0' to 168'.		
Static level 120' below casing top which is 1' above GL		
Pumping level 168' when pumping at 0 gpm for 2 hours		
Permanent pump installed at 168' on June 15, 1992, with a capacity of 10 gpm		
Additional Lot #4, B. Sheridan Rd. Park subdivision. location info:		
Location source: Location from permit		
Permit Date: May 15, 1992	Permit #:	



00236001

COMPANY Gross, Eugene J.
 FARM Johnson, David
 DATE DRILLED June 10, 1992 NO.
 ELEVATION 0 COUNTY NO. 37097
 LOCATION NW SE SE
 LATITUDE 42.430827 LONGITUDE - 87.829213
 COUNTY Lake API 120973709700 28 - 46N - 12E

Private Water Well	Top	Bottom
topsoil	0	2
sand & yellow clay	2	12
yellow clay	12	18
blue clay	18	69
sand	69	75
hardpan	75	163
rubble	163	167
limestone	167	175
Total Depth		175
Casing: 5" ASTM T/C 15#/' from 0' to 167'		
Grout: CLAY SLURRY from 0 to 20.		
Size hole below casing: 5"		
Water from limestone at 167' to 175'.		
Pumpángepámpínshéálpúmpínngát OngPámpúnry Héurá990, with a capacity of 8 gpm		
Additional Lot , subdivision.		
location info:		
Address of well: 10238 W. Wadsworth Zion, IL		
Location source: Location from the driller		
Permit Date:	Permit #:	



COMPANY Boyce, Kenneth D.
 FARM Patrone, Larry
 DATE DRILLED February 19, 1990 NO.
 ELEVATION 0 COUNTY NO. 27293
 LOCATION NW SE SE
 LATITUDE 42.430827 LONGITUDE - 87.829213
 COUNTY Lake API 120972729300

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

	Top	Bottom
Total Depth		8



Permit Date: Permit #:

COMPANY STS Consultants
 FARM IL Beach Pk/Concession
 DATE DRILLED July 18, 2002 NO. B-2
 ELEVATION 587GL COUNTY NO. 47796
 LOCATION SE NE SE
 LATITUDE 42.432491 LONGITUDE - 87.807080
 COUNTY Lake API 120974779600

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

	Top	Bottom
Total Depth		15



Permit Date: Permit #:

COMPANY STS Consultants
 FARM IL Beach Pk/Concession
 DATE DRILLED July 18, 2002 NO. B-3
 ELEVATION 588GL COUNTY NO. 47797
 LOCATION SE NE SE
 LATITUDE 42.432491 LONGITUDE - 87.807080
 COUNTY Lake API 120974779700

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

	Top	Bottom
Total Depth		8



Permit Date: Permit #:

COMPANY STS Consultants
 FARM IL Beach Pk/Concession
 DATE DRILLED July 18, 2002 NO. B-7
 ELEVATION 587GL COUNTY NO. 47800
 LOCATION SE NE SE
 LATITUDE 42.432491 LONGITUDE - 87.807080
 COUNTY Lake API 120974780000

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	Top	Bottom
Total Depth		15



Permit Date: Permit #:

COMPANY STS Consultants
 FARM IL Beach Pk/Concession
 DATE DRILLED July 18, 2002 NO. B-5
 ELEVATION 588GL COUNTY NO. 47799
 LOCATION SE NE SE
 LATITUDE 42.430204 LONGITUDE - 87.806483
 COUNTY Lake API 120974779900

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	Top	Bottom
Total Depth		15



Permit Date:

Permit #:

COMPANY STS Consultants
 FARM IL Beach Pk/Concession
 DATE DRILLED July 18, 2002 NO. B-4
 ELEVATION 590GL COUNTY NO. 47798
 LOCATION SE NE SE
 LATITUDE 42.430204 LONGITUDE - 87.806483
 COUNTY Lake API 120974779800

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

Water Well	Top	Bottom
Total Depth		510
Driller's Log filed		
Survey Sample Study filed		
Sample set # 17181 (0' - 1002')		
Permit Date:	Permit #:	



COMPANY Geiger Co
 FARM Beach State Park
 DATE DRILLED NO.
 ELEVATION 630GL COUNTY NO. 02321
 LOCATION NW SW SW
 LATITUDE 42.430641 LONGITUDE - 87.804632
 COUNTY Lake API 120970232100

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	Top	Bottom
Total Depth		8



Permit Date: Permit #:

COMPANY STS Consultants
 FARM IL Beach Pk/Concession
 DATE DRILLED July 18, 2002 NO. B-1
 ELEVATION 585GL COUNTY NO. 47795
 LOCATION SW NW SW
 LATITUDE 42.432468 LONGITUDE - 87.804623
 COUNTY Lake API 120974779500

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A.2 ISWS LOGS

Illinois State Water Survey PICS Database

Thursday, June 8, 2006

County: LAKE

Township: 46N

Range: 12E

Sections: 14-17,20-2326

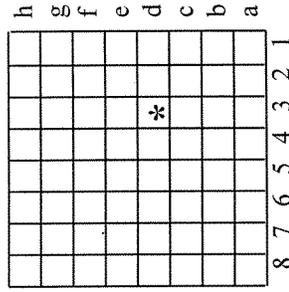
Records Found: 11

Questions: Contact the Illinois State Water Survey's Ground Water Division @ (217)-333-9043

Publication: Please cite the Illinois State Water Survey's PICS (Public-Industrial-Commercial) Database in all publications based wholly or partially on this information.

Note: The data in the PICS Database is a listing of municipal and commercial wells which are known to the Illinois State Water Survey (ISWS). This information was initially entered from public water supply data and supplemented with the Illinois State Water Inventory Project data. This database is updated as additional information is received and verified.

This data cannot be resold or redistributed. The Illinois State Water Survey must be acknowledged in any use of this material.



Location of a 10-acre-plot within a section:

The origin can be found at the lower right-hand-corner of an 8 x 8 grid. In this example, the well is in the 10-acre plot '3d'.

SWSID	FIPS	TWN	RNG	SEC	PLOT	NAME	DB ID	WELL #	DEPTH	STATUS	SEALED TYPE	YEAR		
												DRILLER	DRILLER	
09795790	097	46N	12E	14	1D	LAKE CO PWD - ZION BENTON	10087	1		I			1955	
09769850	097	46N	12E	15	2E	ILLINOIS BEACH STATE PARK	11890	101	100	U				
09795125	097	46N	12E	15	8E	AVALON MHP	2726	1	83	S		1995	--	--
09795245	097	46N	12E	15	8F	HOLLY HOCK HILL MHP	2725	1	126	I	--		1956	--
09792000	097	46N	12E	21	1A	ZION	2727	3	995	S	S	1958	1935	JP MILLER/VARNER
09792000	097	46N	12E	21	1B	ZION	2728	1	1093	D	D	--	1926	LAYNE-BOWLER/VARNER
09792000	097	46N	12E	21	6B	ZION	2729	2	220	S		1969	1932	--
09707430	097	46N	12E	22	5A	ZION INDUSTRIES INC	11883	1	93	U				
09730130	097	46N	12E	23	6B	EXELON - ZION STATION	11887	1		I				
09795790	097	46N	12E	23	6D	LAKE CO PWD - ZION BENTON	2731	2	23	A	--		1959	RANNEY WELL CO
09795790	097	46N	12E	23	6E	LAKE CO PWD - ZION BENTON	2730	1	33	A	--		1952	RANNEY WELL CO

City Zion County Lake
Section 23.6d Twp. No. 46N Range 12E

Location (in feet from section corner) 2950'S, 1560'E, NW cor

Owner Lake Co Water Dist Authority Collector # 2
now Lake Co PWD - Zion Benton

Contractor Ramsey Water Supplies Co Address _____

Date drilled 1959 Elev. above sea level top of well 571

Depth 23 ft Water from #2 pumped to #1

Log 4 perforated laterals 120', 144', 88' & 204' respectively,
from north to south, 75° < between pipes

Were drill cuttings saved _____ Where filed _____

Size hole 13 ft If reduced, where and how much _____

Casing record concrete 13' dia casing

Distance to water when not pumping _____ Distance to water is _____

feet after pumping at _____ G. P. M. for _____ hours.

Reference point for above measurements _____

Type of pump Being submersible Distance to cylinder _____

Length of cylinder _____ Length of suction pipe below cylinder _____

Length stroke _____ Speed _____

Hours used per day _____ Type of power electric motor

Rating of motor 15 HP Rating of pump in G. P. M. 1200

Can following be measured: (1) Static water level _____

(2) Pumping level _____ (3) Discharge _____

(4) Influence on other wells _____

Temperature of water _____ Was water sample collected _____

Date _____ Effect of water on meters, hot water

coils, etc. _____

Date of Analysis _____ Analysis No. _____

Recorder Robert T. Lasman

Date Jan 8, 1960

City Zion County Lake
Section 23 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 1057 E. of SW corner 2450 S + 1500 E
now Lake Co PWD - Zion Benton 11/2/58

Owner Lake Co. Public Water Supply Authority

Contractor Ranney Collector Address _____

Date drilled _____ Elev. above sea level top of well 591.33

Depth 33'

Log _____

Were drill cuttings saved _____ Where filed _____

Size hole 13' If reduced, where and how much _____

Casing record _____

Distance to water when not pumping 15' Distance to water is 22'

feet after pumping at 700 G. P. M. for 1 hours.

Reference point for above measurements _____

1 Type of pump Pomona # AV 2516 Distance to cylinder 28' 5/8" x 8" x 1 7/16"

Length of cylinder 4' 5/8", 5 Sta. 12" Length of suction pipe below cylinder 1' x 8"

Length stroke _____ Speed _____

Hours used per day _____ Type of power F.M. # F 318925

Rating of motor 60HP, 1765RPM Rating of pump in G. P. M. 750

Can following be measured: (1) Static water level Yes

(2) Pumping level Yes (3) Discharge Yes

(4) Influence on other wells no

Temperature of water 50.4° F Was water sample collected Yes

Date 11-20-58 Effect of water on meters, hot water

coils, etc. _____

Date of Analysis _____ Analysis No. _____

Recorder WJ Wood

Date 11-21-58

Hannan

City Jim County Lake

Section 23.62 Twp. No. 96N Range 12E

Location (in feet from section corner) 2450' S, 1500' E, NW cor

Owner Lake Co Water Dist Authority Collector #1

Contractor Ramsey Water Supplies Co Address now Lake Co PWD - Zion Benton

Date drilled 1952, 1957 Elev. above sea level top of well 591.33

Depth 33' 5 collector pipes, 3-12' dia 47', 76' & 104'

Log 2-8" dia 96' & 164'

fan shaped 30° between pipes

Were drill cuttings saved _____ Where filed _____

Size hole 13ft If reduced, where and how much _____

Casing record 13' dia concrete caisson

Distance to water when not pumping _____ Distance to water is _____

feet after pumping at _____ G. P. M. for _____ hours.

Reference point for above measurements _____

Type of pump 2 F-M Porona Turbines Distance to cylinder 28' x 8"

Length of cylinder 12" 5 stages Length of suction pipe below cylinder 1 x 8"

Length stroke _____ Speed _____
1 pump has, in addition to the motor, a 2 gear drive and a 80 HP Continental gasoline engine

Hours used per day _____ Type of power F-M electric motor

Rating of motor 60 HP Rating of pump in G. P. M. 750 / 230' TDH (each)

Can following be measured: (1) Static water level Yes

(2) Pumping level Yes (3) Discharge Yes

(4) Influence on other wells _____

Temperature of water _____ Was water sample collected _____

Date _____ Effect of water on meters, hot water

coils, etc. _____

Date of Analysis _____ Analysis No. _____

Recorder Robert T. Basman

Date Jan 8, 1960

Burt Hanson 1961 Min R

City 7/100 County Jamez

Section 213 Twp. No. 4611 Range 12E

Location (in feet from section corner) 2450'S, 1500'E, NW cor

Owner Lake Co Public Water Supply District Authority now Lake Co PWD - Zion Benton

Contractor Ranney collector Address _____

Date drilled _____ Elev. above sea level top of well 591.33

Depth 33'

Log _____

Were drill cuttings saved _____ Where filed _____

Size hole 13' If reduced, where and how much _____

Casing record _____

Distance to water when not pumping 15' Distance to water is 22'

feet after pumping at 700 G. P. M. for 1 hours.

Reference point for above measurements _____

Type of pump _____ Distance to cylinder _____

Length of cylinder _____ Length of suction pipe below cylinder _____

Length stroke _____ Speed _____

Hours used per day _____ Type of power _____

Rating of motor _____ Rating of pump in G. P. M. _____

Can following be measured: (1) Static water level _____

(2) Pumping level _____ (3) Discharge _____

(4) Influence on other wells _____

Temperature of water 50.4°F Was water sample collected Yes

Date 11-20-58 Effect of water on meters, hot water

coils, etc. Complete data sent to Hanson

Date of Analysis _____ Analysis No. 148254

Recorder WJ Wood

Date 11-21-58

{ 64 616 }
{ 64 65 }
44

Revised 21

STATE WATER SURVEY WELL DATA.

Date July 31 1925

Recorder W. L. ...

Authority _____

Owner City of ... City ... County ...

When drilled _____ Contractor _____ Address _____

Location (give location from section corner if possible) _____

1480' North + 510' East from S.E. cor. Sec 21 - 46N - 12E

Elevation top of well 635. Depth 1025

Log See City Report -

163' to Sandstone 896 to top of P. Sand -

Casing record _____

10x
896
130

Size hole _____

Were drill cuttings saved? _____ Were they sent to State Geological Survey? _____ Distance to water when not pumping _____ After pumping at _____ gpm. for _____ hours, Reference point for above measurements _____

Type of pump Turbine ^{75HP} Distance to cylinder _____

Length of suction pipe below cylinder _____

Length stroke _____ Speed _____ Hours used per day _____

Type of power Motor

Can following be measured: Water level not pumping _____ Pumping _____

Discharge 400 gpm Influence on other wells _____

Temperature of water 16° C Were water samples collected Yes

Date _____ Analysis number 64616 Effect of water on

meters, hot water coils See 56083

Cost of well _____

s. patent

City ZION County Lake

Section 2702 E 1546 Ave Twp. No. _____ Range _____

Location (in feet from section corner) _____

Owner City of Zion Authority _____

Contractor Layne Bowler Address _____

Date drilled 1925 Elev. above sea level top of well _____

Depth 1120' - originally 1025'

Log _____

Were drill cuttings saved _____ Where filed State Water Survey

Size hole 16 If reduced, where and how much _____

Casing record _____

Distance to water when not pumping 96 (4-1548) Distance to water is ~~325~~ 325'

feet after pumping at 380 G. P. M. for 2 hours.

Reference point for above measurements Floor of Bldg.

Type of pump Layne Centrifugal Distance to cylinder 1350

Length of cylinder Bowl 9 1/4" Length of suction pipe below cylinder Bowl 10"

Length stroke _____ Speed 1100 RPM

Hours used per day 8 to 24 Type of power Electric

Rating of motor 60 Rating of pump in G. P. M. 350

Can following be measured: (1) Static water level _____

(2) Pumping level _____ (3) Discharge _____

(4) Influence on other wells _____

Temperature of water _____ Was water sample collected 5-27-48

Date _____ Effect of water on meters, hot water

coils, etc. Build up of deposit

Date of Analysis _____ Analysis No. 114865-

Recorder _____

Date _____

Well No.

City Zion County Lake

Section 21 Twp. No. 43 N Range 11 E

Location (in feet from section corner) 1230 S, 510 W, of N.E. Cor. of S.E. 1/4 of Sec 21

Owner City of Zion Authority Mr. Erwin Craig, W.W. Supt

Contractor Vorner Well Drilling Co Deepened well Address Dubuque Ia.

Date drilled Deepened 10 1944 Elev. above sea level top of well 523

Depth 1100

Log on file

Were drill cuttings saved Yes Where filed S.G.S

Size hole top 16" bot 9 5/8" If reduced, where and how much 16" @ 0-166; 15" from 166-312; 12" from 312-1028; 12" 1028-1100

Casing record 16" to 166; 12" from 312 to 578.5

Distance to water when not pumping 65-68 in Jan 1944 Distance to water is 254 feet after pumping at 400 G. P. M. for 1 hours on 8/10/44

Reference point for above measurements Pump Base

Type of pump Layne-Bowler 10" turbine Distance to turbine cylinder 350

Length of cylinder 13 stages (9'-7") Length of suction pipe below cylinder 10' of 6"

Length stroke 350' of 6" Column pipe Speed 1800 R.P.M

Hours used per day _____ Type of power Electric

Rating of motor 60 H.P. Rating of pump in G. P. M. 400

Can following be measured: (1) Static water level Yes - if proper gauge is used.

(2) Pumping level Yes (3) Discharge No

(4) Influence on other wells Yes on No 3 and Creamery well

Temperature of water 59.5° Was water sample collected Yes

Date Aug. 10 1944 Effect of water on meters, hot water coils, etc. _____

Date of Analysis _____ Analysis No. 100,996

Recorder J. L. Geils

Date 8/10/44

WELL No. 1

11/11/46

City Zion County Lake

Section 21 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 1120' N, 510' E, of S.W. corner

Owner City of Zion Authority Erwin Craig, W.W. Supt.

Contractor Layne & Bowler Address Zion, Ill.

Date drilled 1926 Elev. above sea level top of well _____

Depth 1100' (deepened by Varner in 1943)

Log See S.W.S files

Were drill cuttings saved _____ Where filed _____

Size hole _____ If reduced, where and how much _____

Casing record _____

Distance to water when not pumping 68' (1943) Distance to water is 232' (Sept. 5, 1946)

feet after pumping at 400 G. P. M. for 4 1/2 hours.

Reference point for above measurements Pump base

Type of pump Layne turbine Distance to bowls cylinder 350'

Length of column cylinder 350'-6" φ Length of suction pipe below cylinder 10'-6" φ

Length stroke _____ Speed _____

Hours used per day over 10 hrs Type of power elect.

Rating of motor 6 HP Rating of pump in G. P. M. 400

Can following be measured: (1) Static water level Yes

(2) Pumping level Yes (3) Discharge No

(4) Influence on other wells Yes on No. 3 & Creamery Well.

Temperature of water 59.4° Was water sample collected Yes after 4 1/2 hrs @ 400

Date Sept. 5, 1946 Effect of water on meters, hot water

coils, etc. Water is treated

Date of Analysis _____ Analysis No. 157588

Recorder O. F. Beils

Date Sept. 6, 1946

630
232
398

630
62
568

2H=7.2
(Running
in cap)

Varner Well Drilling Company

INCORPORATED

905 Du buque Bldg.

Telephone 3691

DUBUQUE, IOWA.

ZION REPAIRS NO. 1 WELL
ZION, ILLINOIS

DATE STARTED July 29, 1943 DATE COMPLETED January 13, 1944

DIAMETER 15" from surface to 575'; 12" from 575' to 1025'; 10" from 1025' to 1100'

DEPTH 1100'

CASING Approx. 163' of 16" O.D. from surface; 12" from 313' to 75'

Pulled pump and checked hole to 1018', cleaned to 1020'

Shot hole at 925' with 166# shot, 950' with 167# shot, and 985' with 167# shot.

Measured hole and cleaned out from 930' to 1025'

Installed 322' test pump - Results: 6.00 P.M. 460 GPM - Water below bowls
6.30 P.M. 390 GPM - Water below bowls
7.00 P.M. 370 GPM - Water below bowls

Removed pump cleaned to 1025' and drilling new 10" hole.

1025' to 1027' - 2' - Limestone
1027' to 1035' - 8' - Grey Dolomite
1035' to 1040' - 5' - Brown Limestone and red Shale
1040' to 1044' - 4' - Brown Shale and Sand
1044' to 1065' - 21' - Brown Sand

Shot hole at 1065' with 200# shot, hole filled to 960'

Cleaned out hole to 1065'

Shot hole at 908' with 250# shot and 970' with 250# shot. Checked hole to 920' and cleaned out to 1065'. Drilling new 10" hole.

1065' to 1070' - 5' - Brown Limestone
1070' to 1080' - 10' - Brown Limestone
1080' to 1086' - 6' - Brown Sandstone

Install 340' of pump and run test, pumping level 340' and pump 435 GPM

Removed pump and cleaned hole to 1086', drilling new 10" hole from 1086' to 1093' - 7' - Sandstone - Very Hard

Install pump and running test - Water drops quickly - Remove pump, hole filled 25'

Clean hole to 1093' and drilled hole to 1100' bottom.

Set new Layne & Bowler Pump - Total pump installed - 369'.

WELL INVENTORY SCHEDULE

Well No. 46112E-21161
Owner's No. 1

Location Zion County Lake

Feet from Sec. Cor. 1120' N, 510' W, SE cor

Owner City of Zion Address Log Chaisman, Dept

Driller Hayne & Bowler Address _____

Date drilled 1926 Method Cable tool

Depth 1100 Hole record 16" 0-163', 15" 163-575 1/2', 12" 575 1/2'-1100'

Casing record 16" 0-163' (slotted 105-130'), 12" 313-575 1/2', 10" 307-375' (19

Screen record slotted 16" casing 105-130'

Log _____ Drill cuttings _____ Sample set no. _____

Chief aquifer Artesian from _____ to _____ Other aquifer _____

Land surface elev. 632.78 Topography _____

Nonpumping level 108.41 ^{above} (below) measuring point on 10-31-62 at _____ AM
(date) _____ PM

Pumping level _____ ^{above} below measuring point after pumping at _____ AM
_____ gpm for _____ hours on _____ at _____ PM
(date) _____

Measuring point (MP) for above measurements air vent plug, at 250

Airline and measuring equipment Steel tape

Pump and power _____

Use of water Standby use since 1957

Water quality _____

Analysis No. and date _____ Temp. _____

Data collected by _____ Date _____

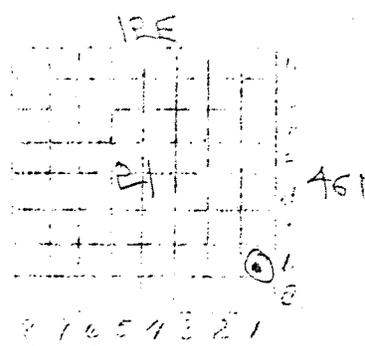
Source of information Paul A. C.

Can well be used in pumping test? _____ Are nearby observation

wells available? _____ Are pumping records available? Yes

Are water level records available? Yes

Remarks: Shot in 1926 in 200 feet sandstone
in 1943, deepened from 1025 to 1100' and shot at
925', 950', 970', 985'.



WELL No. 2

Mineral
Sealed

City Zion County Lake

Section 21 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 1120' N; 510' W. of the SE. corner.

Owner CITY of Zion Authority Erwin Craig W. W. Supt.

Contractor _____ Address Zion, Ill.

Date drilled 1932 Elev. above sea level top of well 651

Depth 220'

Log _____

Were drill cuttings saved ? Where filed ?

Size hole 10" If reduced, where and how much _____

Casing record 160' of 10"

Distance to water when not pumping 18' (May 1944) Distance to water is breaks suction occasionally

feet after pumping at 40 G. P. M. for continuously hours.

Reference point for above measurements Pump base

Type of pump Layne turbine Distance to cylinder bowls 119'

Length of cylinder column 119'-6" Length of suction pipe below cylinder 30' of 4" ϕ

Length stroke _____ Speed _____

Hours used per day Continuously Type of power Elect.

Rating of motor 20 Rating of pump in G. P. M. 50

Can following be measured: (1) Static water level No

(2) Pumping level No (3) Discharge No

(4) Influence on other wells None reported

Temperature of water 51.2° F Was water sample collected Yes

Date Sept. 5, 1946 Effect of water on meters, hot water

coils, etc. Very soft

Date of Analysis _____ Analysis No. 107589

Recorder J. F. Heile

Date Sept. 6, 1946

2H-8.2
mining
24)

City Tracy County Colo

Section 21 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 8 N 137 W SE 21

Owner City of Tracy Authority Mr. Erwin D. N.W. Scott

Contractor Vanner Well Drilling Co. Inc. Address Dubuque Ia

Date drilled 2-28-1922 Elev. above sea level top of well 529.16

Depth 1023

Log See 353

629
75
-54

Were drill cuttings saved no Where filed 353

Size hole 12 1/2" If reduced, where and how much 148.10' from 121-564.10' from 121-926

Casing record See 353

Distance to water when not pumping 75.4' Distance to water is 100'

feet after pumping at (350) G.P.M. for (Same for 10) 2 hours 09/10/22

Reference point for above measurements Top of casing Did you observe?

Type of pump Packless turbine Distance to cylinder 300'

Length of cylinder 300' Length of suction pipe below cylinder 35'

Length stroke _____ Speed _____

Hours used per day 2-28-1922 Type of power Elect

Rating of motor 3-40 Rating of pump in G. P. M. 350

Can following be measured: (1) Static water level Yes (300' Air Line)

(2) Pumping level Yes (3) Discharge No

(4) Influence on other wells No will influence No. 2

Temperature of water 60.3° Was water sample collected Yes

Date 2-28-1922 Effect of water on meters, hot water coils, etc. _____

Date of Analysis _____ Analysis No. 100,997

Recorder _____

Date _____

John C. Moore Corporation, Rochester, N. Y. Binder and holes in leaves, each Patented 1906. 386790

Abandoned

TOWN **Zion City** TOWNSHIP **Benton**
 COMPANY **J. P. Miller Well Co.**
 FARM **Zion City** No. **3** T. **46**
 AUTHORITY **James J. Craig, City Eng.** N
 ELEVATION **629.4**
 COLLECTOR **Workman** DATE DRILLED **1935**
 CONFIDENTIAL **137' W., 78'n. of SE corner**

Map No. **1**
 R. **12E**
 Sec. **21**

No.	STRATA	Thickness		Depth	
		Feet	In.	Feet	In.
	Drift	125		125	
	Sand and gravel, very little water	5		130	
	Drift	16		146	
	Sand, sample of water to Water Survey	1		147	
	Lime rock, gray	183		330	
	Marl, red	20		350	
	Lime, gray	20		370	
	Shale, blue	190		560	
	Lime, gray, hard	303		863	
	Sand, gray	11		874	
	Lime, dark	26		900	
	Sand, gray	93		993	
	Marl red	2		995	
	All measurements to derrick floor.				
	143'2" of 12 1/2" drive pipe with steel shoe 0 to 143'2"				
	254'4" of 10" drive pipe with steel shoe 309'8" to 564'0"				
	Static level 58' at 915' depth				
	Static level (no operations) 51' at 995' depth				
	Before shooting water level 32 1/2'				
	First shot - 40 # 60% at 980'				
	Second shot - 55 # 60% at 955'				
	Water level 35'				
	Third shot 50 # 60% at 925'				
	10" casing damaged a little. 7 1/2" bailer will go through but 10" drill will not.				
	Well not completed to date. April 30, 1935				

County **Lake**

Index No. **0121**

T.—DRILL RECORD

46244—10M—11-35 Illinois Geological Survey, Urbana

Assigned to 1023 in 1942 by Varner

CITY OF SIEN, ILL.
Well No. 3

Date Started - 11-2-42

Date Completed - 1-2-43

Removed 350 ft. of 7 5/8 O. D. Extra Heavy Column, 10" Bowls and 35 ft. of suction pipe.

Swedged 10" liner with 9 7/8" O. D. swedge

Clean Hole to 980 feet.

Well Shot with 100 lbs. shots at 930ft., 945 ft., and 915 ft.

Bailed and drilled sand shot loose from 11-17-42 to 11-8-42

Cleaned hole to 996 f. level.

Drilled 9 5/8" hole from 996 ft. to 1023 ft.

Installed test pump and run test - 12-15-42

17 ft. of sand fill cleared out after test.

Reinstalled owners pump and it is reported by Mr. Erwin Craig, Supt., well delivery is over 400 G.P.M. - Jan. 16, 1943.

10 22 30
18 3 8

City near Zion County Lake

Section 35 26 Twp. No. 46 N Range 12 E

Location (in feet from section corner) NW 1/4 700' N & 500' E SW/c

Owner Jll. Beach State Park Authority driller's log

Contractor S. B. Geiger Address Chicago

Date drilled Aug. 1947 Elev. above sea level top of well 585 ± T. M.

Depth 1002'

Log (over)

(also took 5 ~~series~~ samples at 1, 5, 15, 30, and 60 minutes.)

Were drill cuttings saved yes Where filed S. G. S.

Size hole 8" If reduced, where and how much —

Casing record 124' of 8" pipe 150' of 6" liner 290' to 440'

Distance to water when not pumping 12' Distance to water is 137

feet after pumping at 38 G. P. M. for 4 1/2 hours.

Reference point for above measurements top of casing

Type of pump test Distance to faulst cylinder 152'

Length of faulst cylinder 5' Length of suction pipe below cylinder 12'

Length stroke _____ Speed _____

Hours used per day _____ Type of power _____

Rating of motor _____ Rating of pump in G. P. M. _____

Can following be measured: (1) Static water level _____

(2) Pumping level _____ (3) Discharge _____

(4) Influence on other wells none

Temperature of water 54.4 Was water sample collected 8-18-47

Date _____ Effect of water on meters, hot water

coils, etc. very slight H₂S odor

Date of Analysis _____ Analysis No. _____

pH 7.6 Recorder F. K. B.

Date 8-20-47

Thickness	Depth	Description
45	45	drift sands
3	48	blue mud
4	52	blue sand (sand)
28	80	blue shale
6	86	blue shale
26	122	blue shale
12	134	blue sand ← * note below
6	140	blue sand
20	160	blue sand
10	170	blue sand
5	175	shale, gray
35	210	lime, buff
12	222	sand, lime
72	294	lime
5	300	red shale
5	305	gray shale, fossils
28	333	blue shale
47	440	limestone
395	835	brown sandy lime
157	992	St Peter Sand
8	1000	Red Rock

* Small Crevices at 126'. Water level up to 30', muddy.

Illinois Dept. of Public Health
Yellow Copy: Well Contractor
Golden Copy: Well Owner

Well Construction Report

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS OF WELL COMPLETION AND SENT TO THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH DIVISION OF ENVIRONMENTAL HEALTH 525 WEST JEFFERSON STREET SPRINGFIELD, ILLINOIS 62761

GEOLOGICAL AND WATER SURVEYS WELL RECORD
RICK KRABBE, PROJECT DRILLER
License No. 102-00324
9. Driller **LAYNE - WESTERN**
10. Well Site Address **THUNDERHAWK C.C. - 1240 3RD ST**
11. Property Owner **LAKE COUNTY FOREST** Well No. **1**
12. Permit No. **WW97-03-0391** Date Issued **5/19/97**

Thunderhawk Golf Course

13. Location: **1500' W & 1500'S OF NE CORNER**
County **LAKE**
Sec. **30N**
Twp. **46N**
Rge. **12E**

Show location in section plat

NW 0 SE NE

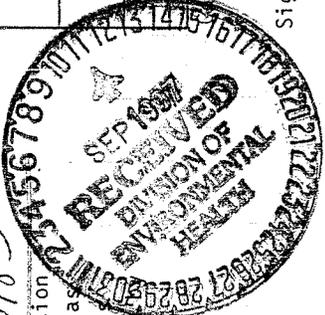
14. Water from	at depth	ft
Diam. (in)	Kind and Weight	From (ft) To (ft)
18"	STEEL - 70.59#	+ 2 206
14"	" - 54.57#	+ 3 634
10"	" - 40.48#	1056 1179

15. Casing and Liner Pipe
16. Screen: Diam. 10 in, Length 10 in, Slot Size 710 ft msl.
17. Size hole below casing 10 in. 18. Ground Elev. 710 ft msl.
19. Static level 215 ft below casing top which is 3 ft. above ground level. Pumping level 513 ft, pumping gpm for 24 hours.

20. Earth Materials Passed Through	Depth of Top	Depth of Bottom
SEE ATTACHED		

Continue on separate sheet if necessary.

Signed **Gregory R. Buehler** Date **9/8/97**



1. Type of Well

a. Bored	Hole Diam.	in.	Depth	ft

b. Driven Drive Pipe Diam. in. Depth ft
 c. Drilled X Finished in Drift TO (Ft.)
 d. Grout: CEMENT FROM (Ft.) 0 TO (Ft.) 634

2. Well furnishes water for human consumption? Yes No X
 3. Date well drilled JUNE - JULY, 1997
 4. Permanent pump installed? Yes X Date 8/97 No
 Manufacturer BYRON JACKSON Type SUBM.
 Location
 Capacity 800 gpm. Depth of setting 690 ft.
 Well top sealed? Yes X No Type WEDED PANTS
 Pitless adapter installed? Yes No X Model No.
 How attached to casing?
 7. Well disinfected? Yes X No
 8. Pump and equipment disinfected Yes X No

00440183

IMPORTANT NOTICE
This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE

Do Not Use 'Fol' Pen

PICS 09705242, #1 0001126



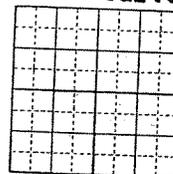
ILLINOIS GEOLOGICAL SURVEY, URBANA

Strata	Thickness	Top	Bottom
PLEISTOCENE SERIES			
Sand, yellowish brown	25		25
Till, sandy, gravelly, dark yellowish brown	25		50
Till, pinkish brown	40		90
Gravel, light gray	5		95
Till, calcareous, pinkish brown	20		115
No sample	5		120
SILURIAN SYSTEM			
Niagaran Series			
Dolomite, white to yellowish gray; cherty in lower portion	150		270
Alexandrian Series			
Dolomite, white to yellowish gray, cherty at top	25		295
ORDOVICIAN SYSTEM			
Maquoketa formation			
Shale, dolomitic, green; some dolomite streak at top	200		495
Galena formation			
Dolomite, sandy, pale brown to buff, some yellowish gray at top	155		650
Decorah formation			
Dolomite, brown to gray	38		688
Platteville formation			
Dolomite, brownish to gray	142		830
Glenwood formation			
Dolomite buff to brown	45		875
Sandstone, white dolomitic, fine to coarse	25		900
St. Peter formation			
Sandstone, yellowish white, fine to coarse, incoherent	102		1002

Sample study summary log furnished by State Geological Survey.

COMPANY **Geiger**
 FARM **Beach State Park**
 DATE DRILLED **1947**
 AUTHORITY **L. Selkregg**
 ELEVATION **630' est. T.M.**
 LOCATION **4500'S. 29th St., Zion, Ill.**
 COUNTY **LAKE S.S. #17181**

67 Well No. 1



23-46N-12E

26

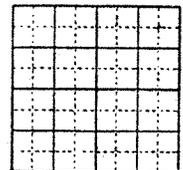


ILLINOIS GEOLOGICAL SURVEY, URBANA

Strata	Thickness	XXX Thickness	Bottom
PLEISTOCENE SYSTEM			
Sand, yellowish brown		25	25
Till, sandy, gravelly, dark yellowish brown		25	50
Till, pinkish brown		40	90
Gravel, light grey		5	95
Till, calcareous, pinkish brown		20	115
No sample		5	120
SILURIAN SYSTEM			
Niagaran Series			
Dolomite, white to yellowish gray, some cherty in lower portion		150	270
Alexandrian Series			
Dolomite, white to yellowish gray, cherty at top		25	295
ORDOVICIAN SYSTEM			
Maquoketa formation			
Shale, dolomitic, green; some dolomite streak at top		200	495
Galena formation			
Dolomite, sandy, pale brown to buff, some yellowish gray at top		155	650
Decorah formation			
Dolomite, brown to gray		38	688
Platteville formation			
Dolomite, brownish to gray		142	830

COMPANY Geiger
 FARM Beach State Park
 DATE DRILLED 1947
 AUTHORITY Summary Sample Study
 ELEVATION 630' est. I.M.
 LOCATION 4500'S 29th St., Zion, Ill.
 COUNTY LAKE S.S. #17181

NO.
 COUNTY NO.



2623-46N-12E

ILLINOIS GEOLOGICAL SURVEY, URBANA

Strata	Top	Top THICKNESS	Bottom
Glenwood formation			
Dolomite, buff to brown		45	875
Sandstone, white, dolomitic, fine to coarse		25	900
St. Peter formation			
Sandstone, yellowish, white, fine to coarse, incoherent		102	1002

Geiger Beach State Park

COUNTY LAKE S.S. #17181 23-46N-12E

WATER WELL SEALING FORM

Lake County Health Department
Division of Environmental Health

FILE WW 95-03-0980

3010 Grand Avenue
Waukegan, IL 60085
(708) 360-6740

121 E. Grand Avenue
Lake Villa, IL 60046
(708) 356-6222

118 S. Main Street
Wauconda, IL 60084
(708) 526-1125

This form shall be submitted to the Lake County Health Department at the time of the sealing of potable wells, boring or monitoring wells. Such wells are to be sealed not more than 30 days after they are abandoned in accordance with the sealing requirements in the Water Well Construction Code.

1. Owner of Property Avalon Mobile Home Park 1639 Sheridan Rd Zion Ill 60099
Name Address Zip

2. Well Location: Same
Street City County

General Description: Section 15, Township 46, Range 12 P.I.N#: 04-15-118-002

4. Drilling Permit No. (and date, if known)

5. Type of Well: Drilled x Driven ___ Dug ___ Other ___

6. Total Depth 90 Static Level 15 Diameter (inches) 5

7. Formation clear of obstruction? Yes x No ___ Depth to Obstruction ___

8. DETAILS OF PLUGGING:

From 0 To 90 feet

Kind of Plug 3/4 Bentonite

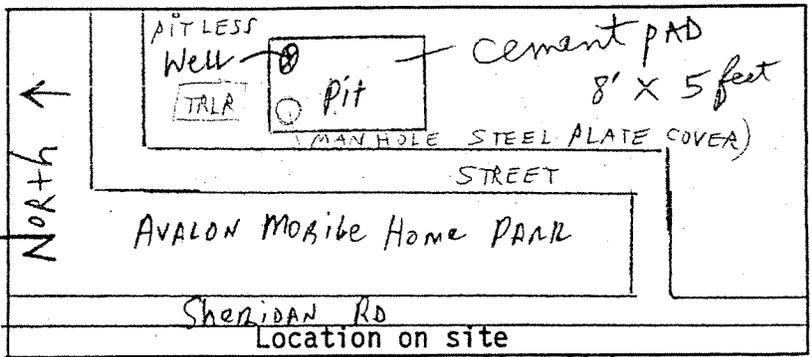
From ___ To ___ feet

Kind of plug ___

From ___ To ___ feet

Kind of plug ___

From ___ To ___ feet



9. CASING RECORD

Upper 3 feet of casing removed? Yes x No ___

If well casing consists of brick, stone, concrete blocks, porous tile, or other porous material, casing was removed to a depth of 10 feet below the surface. Yes ___ No ___

10. Date well was Sealed: Oct 27 95
Month Day Year

11. Licensed water well driller or other person approved by the Department performing well sealing:

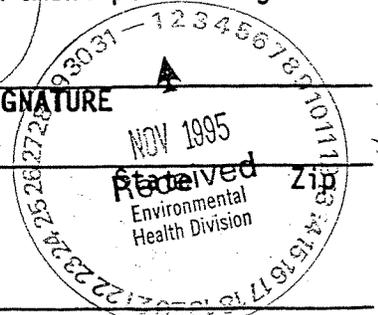
William D. Maade
Name (PRINT)

P.O. Box 250 Russell Ill. 60075
Address

102-000-783
License Number

City

SIGNATURE



Date 10-27-95

SEALING OF WELL OBSERVED BY Eric Nyström

signature

Lake County Health Department
Division of Environmental Health

Sealing Method approved by Eric Nyström

AT site.

Date 10-27-95

COA 43032

Illinois Environmental Protection Agency

Bureau of Water - Division of Public Water Supplies

Inspection Report - Elgin Regional Office

FACILITY NAME		Holly Hock Hill Mobile Home Park		FACILITY NUMBER		IL0975245			
PLANT PHONE		1-847-336-5955		COUNTY		Lake			
INSPECTION DATE		December 9, 2003		INSPECTED BY:		Chris Johnston			
SEND CORRESPONDENCE TO				EXEMPTION / LABORATORY FEE STATUS					
NAME OR ENTITY		Mr. Harris DeJong		CHLORINE (Date)		Not exempt			
ADDRESS		P.O. Box 66		CERTIFIED OPERATOR		May 23, 1991			
CITY, STATE, ZIP		Wadsworth, Illinois 60083		LAB FEE PARTICIPANT (Y/N)		No			
CONTACT INFORMATION									
CERTIFIED OPERATOR		Mr. Harris DeJong		CLASS		"C"			
PHONE:		1-847-336-5955		FAX:		1-847-336-5956			
PAGER:		1-847-370-0367		OTHER:		None			
OWNER - RESPONSIBLE PERSONNEL		Mr. Harris DeJong		TITLE OR POSITION		Owner			
PHONE:		1-847-336-5955		FAX:		1-847-336-5956			
OTHER CONTACTS		NAME		TITLE OR POSITION		PHONE			
		Mr. Brad DeJong		Assistant		1-847-528-2420			
		Mr. Roy Hogan		Residential Manager		1-847-731-0091			
HOME PAGE ADDRESS		None							
FACILITY STATUS									
Open		Critical Review		Restricted Status	X	Reason	Insufficient hydropneumatic storage	Date	12/16/1983
BRIEF DESCRIPTION OF SYSTEM AND SERVICE AREA									
SERVICE CONNECTIONS						# METERS			
NUMBER OF DIRECT SERVICES				29		0			
DIRECT SERVICES OUTSIDE CORPORATE LIMITS				0		0			
Residential Customers				29		0			
Commercial Customers				0		0			
Industrial Customers				0		0			
SATELLITE WATER SYSTEMS / INTERCONNECTIONS				FACILITY NUMBER		Source?	Customer?		
None				N/a		N/a	N/a		
ADEQUACY OF SUPPLY									
DATE RANGE		FROM	January 2002	TO	December 2002	PLANT CAPACITY (MGD)	0.036 MGD		
LIMITING FACTOR FOR PLANT CAPACITY?						Capacity of well #1			
ANNUAL PUMPAGE (MG)		RAW		N/a		FINISHED		1.433914 MG	
AVERAGE DAILY (MGD)		RAW		N/a		FINISHED		0.003936 MGD	
MAX 7 Day Average (MGD)		RAW		N/a		FINISHED		0.006667 MGD	
Historical MAX 7-Day Average (MGD)		RAW		N/a		FINISHED		0.006667 MGD	
POPULATION		52		Estimated or Census Data			Census		
		How was Estimated Population Figured?						N/a	
AVERAGE DAILY PER CAPITA USAGE:		76 gpppd		Time to Produce Average Daily (Finished)			2.6 hours		
		Time to Produce MAX 7- Day Average (Finished)						4.4 hours	

TREATMENT APPLICATION POINT SUMMARY											
TAP #	Location or Description	Source Name	Source ID	Status (A, I or X)	Well Depth	Casing Length	Aquifer	Current Production (GPM)	GWUDI Eval. (DATE)	Waivers	
										VOC	SOC
TP 01	Treatment for well #1 inside wellhouse at 1601 Sheridan Rd., 60099	Well #1	WL20228	A	126 feet	126 feet	Drift	25 gpm @ 5.0 HP & unknown head	March 28, 1994	No application submitted	No application submitted
Source Use (Disconnected sources, backups, seasonal use, etc)		Operates automatically off system pressure.									
Bacteriological History (Raw water samples)		No detections in the last 12 months.									
TREATMENT	Disinfectant Used		Fluoridation Chemical Used		Other Chemical Addition		Other Treatment				
	Sodium Hypochlorite (10% strength, diluted 50%. A peristaltic pump rated 85 gpd @ 25 psi is used).		None		None		N/a				
	Installation Deficiencies						General Condition of Plant				
	1. The majority of the 960 gallon hydropneumatic tank is buried, and the tank does not have bypass piping. 2. Two, 82 gallon bladder tanks. 3. No containment or protective curbings for the sodium hypochlorite tank. 4. The chlorine solution tank is not calibrated, is not provided with a scale, and is not vented properly, and was installed without a construction permit. 5. Insufficient hydropneumatic storage.						Fair				
Other Comments regarding this TAP		At this location is a wellhouse for well #2, treatment for well #2, a 960 gallon hydropneumatic tank (majority buried, with only the face entering the pit), and two, 82 gallon bladder tanks. Had a 1,1,1-trichloroethane detection of 2 ppb on April 8, 1987. Followup samples had no detections.					Emergency Power		Manual generator		
Well #1 (ID WL20228) Inorganic Statistics											
Inorganic (type)						Concentration (mg/L)					
Iron						0.11 mg/L (April 3, 2002)					
Manganese						0.004 mg/L (April 3, 2002)					
Hardness as CaCO ₃						106 mg/L (May 6, 1996)					
Alkalinity as CaCO ₃						164 mg/L (May 6, 1996)					
Total Dissolved Solids						348 mg/L (May 6, 1996)					
Natural Fluoride						1.1 mg/L (April 3, 2002)					
pH						7.93 (May 6, 1996)					

Operating Reports / Records											
Content of Monthly Reports											
Monthly Reports Being Submitted?			Report for each TAP?		Daily Production from Each Well?		Daily Measured Residuals?		Daily Dosage Calculations?		Notes and Other Observations
Yes	No	Late	Yes	No	Yes	No	Yes	No	Yes	No	
X			X			X		X		X	
Cross Connection control Ordinance											
Does the system have an ordinance?		Date Approved (by IEPA)		Program Enforced?		Do Private Wells Exist in the Service Area?					
Yes	No			Yes	No	Yes		No			
X		November 1983		X				X			

Daily Operating Reports being sent average three readings per month. These reports do not include any monthly totals, averages, maximums, minimums, or chlorine data.

Monitoring											
Bacteriological Summary											
Monitoring History (Last 12 Months)											
			Raw	Finished	Distribution	Primary Lab		Phone		FAX	
Number of Samples			0	0	12	North Shore Sanitary District		1-847-623-6060		1-847-623-0804	
Number Satisfactory			0	0	12	Secondary Lab		Phone		FAX	
Number Invalid			0	0	0	PDC		1-309-692-9688		1-309-692-9689	
Number Unsatisfactory			0	0	0	Coliform Monitoring Plan Approved?		All Major Portions of system included in Plan?		Chlorine Residuals taken at Sample Sites?	
Fecal / E. Coli. Positive			0	0	0	Yes No		Yes No		Yes No	
Monitoring Violations			0	MCL Violations	0	X		X		X	
Fluoridation Summary (Last 12 months)											
TAP No	No. of Samples	Minimum (mg/l)	Maximum (mg/l)	Average	Violations (list months)			Notes and Observations (Fluoridation)			
N/a	N/a	N/a	N/a	N/a	N/a			Does not add fluoride, and exempt			

Viability / Financial Management			
Service Fee (Minimum Charge)	None - included in the rent	Other source(s) of income used to maintain the water system	
Direct Charge (cost per 1,000 gallons)	N/a	Does the Utility have an ACTIVE program to ensure all customers pay bills?	
Billing Frequency	N/a	Does the utility have a fund to cover major repairs?	
ICC Regulated? (Y/N)	N/a	Name and phone no. of person responsible for system repairs.	
Date of Last Rate Increase	N/a	Name and Phone No. of Person Responsible for Financial Management of the Water System	
		Major Water Supply Concerns expressed by Residents/ Customers.	
What was the most recent major repair or improvement involving This Water System (Include Dates)			
1998 - new well pump.			
Planned, Anticipated or Needed Upgrades and Improvements (Include dates or timeframe if known)		Water meters at residences	

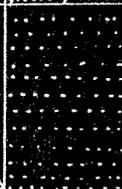
Service Area / Pressure Zone / Distribution System												
Water Source(s)				TP 01								
Location or Description				Service Area Population		No. of Service Connections		Finished Water Storage (Show Capacities)				
								Ground	Elevated	Hydropneumatic		
Entire distribution system				52		29		None		None		960 gallons
								---		---		*82 gallons
								---		---		*82 gallons
Maximum System Pressure		Location		Minimum System Pressure		Location		Free Chlorine Residual (mg/l)		Location		
50 psi		Low point of system		30 psi		High point of system		0.4 mg/L		Distribution system		
Flushing Program				Fire Protection Provided?		Current Map Available?		Valve Maintenance Program			Notes and Other Observations	
None	Yearly	2 x year	More Often	No	Yes	No	Yes	No Valves	No Program	OK		
	X			X			X			X	*Bladder Tanks. The distribution system consists of 2,356 feet of main, all of which is less than 4-inches in diameter. The area is served by sanitary sewers.	

ZION CITY WELL No. 1

LAYNE-BOWLER CHICAGO COMPANY, - DRILLERS

SAMPLE SET # 485, STATE GEOLOGICAL SURVEY, URBANA, ILL.

Studied April 1927, by L.E. Workman.

		163	143		No samples					
SILURIAN	NIAGARA	162	137	163	 <p>Dolomite, light gray and buff, very finely crystalline.</p>					
			300							
			20	320			Dolomite, buff, medium crystalline			
			22	322			Dolomite, greenish gray, finely crystalline			
			27	328			Shale, light blue, soft shale, red, soft			
			30	360			Dolomite, red, yellow, gray, and green; shale, brown			
			16	376			No samples			
			24	400			Shale, dolomitic, greenish gray			
			20	420			No samples			
			2	422			Dolomite, light gray, finely crystalline			
ORDOVICIAN	MAQUOKETA	222	49		No samples					
				419						
			26	500		Shale, dolomitic, brownish gray, soft				
			47			No samples				
				597						
			ORDOVICIAN	GALENA- PLATTEVILLE	219	198	795	 <p>Dolomite, light brown, finely crystalline.</p>		
						95				
							890			Sandstone, dolomitic, buff, fine
						6	892			Dolomite, sandy, gray
						12	894			Sandstone, dolomitic, buff, very fine
24	888					Dolomite, silty and sandy, gray				
8	892					Dolomite, very fine sandy, buff and gray				
ORDOVICIAN	ST. PETER	129				127			 <p>Sandstone, white and buff, fine to medium</p>	
						2	1022			

APPENDIX B

BORING LOGS

- B.1 2006 STRATIGRAPHIC AND INSTRUMENTATION LOGS
- B.2 HISTORICAL GEOTECHNICAL LOGS

B.1 2006 STRATIGRAPHIC AND INSTRUMENTATION LOGS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-01S
 DATE COMPLETED: May 1, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	594.10 591.43					
2	GRAVEL SAND (FILL) - trace to some gravel, trace organics, fine to medium grained, brown, moist	591.33					
10	SP-SAND, trace to some gravel, loose to compact, wet, fine to medium grained, brown	581.43		1		0	10
14				2		55	16
18				3		80	15
18	SM-SAND, with trace to some silt, trace gravel, compact, fine grained, brown, wet	574.43		4		80	19
20				5		65	29
24	SP-SAND, trace to some silt, compact to dense, fine grained, brown, wet	567.43		6		95	44
28	ML-SILT, dense, fine grained, grey, wet	562.18		7		95	62
30				8		90	21
32				9		90	44
34				10		100	25
36				11		75	28
38				12		0	29
	CL-CLAY, till (clay, trace to some silt, trace	552.43 551.93		13		70	50

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-01S
 DATE COMPLETED: May 1, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> gravel), dense, grey, gravel, very well embedded in finer matrix, dry, till END OF BOREHOLE @ 39.5ft BGS </div>		<u>WELL DETAILS</u> Screened interval: 572.43 to 551.93ft AMSL 19.00 to 39.50ft BGS Length: 20.5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 574.43 to 551.93ft AMSL 17.00 to 39.50ft BGS Material: #5 Quartz Sand					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-02S
 DATE COMPLETED: May 2, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	593.78 591.21	4" Ø above ground protective casing				
2	GRAVEL & GRASS SAND with GRAVEL (FILL), presence of organics (trace), fine grained, brown, moist	591.11	Concrete				
4			Bentonite and Cuttings				
6			2" Ø PVC Well Riser				
8			Bentonite Seal				
10	SAND (FILL), trace to with silt, trace gravel, very loose to compact, fine grained, brown, moist	581.21	4.25" Ø Borehole	1		15	8
12				2		15	4
14	- trace organics, piece of wood, black (1cm x 1cm) at 13.5ft BGS - getting wet at 14.0ft BGS			3		30	-
16				4		30	18
18				5		30	19
20	CL-SILTY CLAY TILL (silty clay, trace sand, trace gravel), fine grained, brownish-grey, wet	571.21 570.96	2" Ø PVC Well Screen	6		30	5
22	SM-SILT & SAND, trace clay, trace gravel, very loose, fine grained, brown, wet, clay till lenses observed within sandy material between 0.5" to 4" in thickness		Sand	7		40	6
24				8		95	20
26				9		50	9
28				10		30	4
30				11		50	17
32				12		40	19
34				13		10	64
36	SW-SAND, medium to coarse grained, trace silt, compact, wet	556.21 555.71 555.21	Bentonite	14		25	2
38	CL-CLAY TILL (clay, trace to with silt, trace gravel, trace sand), compact, grey, moist, coarse material well embedded in fine matrix SILT & SAND, trace clay, trace gravel, very loose to loose, brown, wet, 1" to 3" thick lenses						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

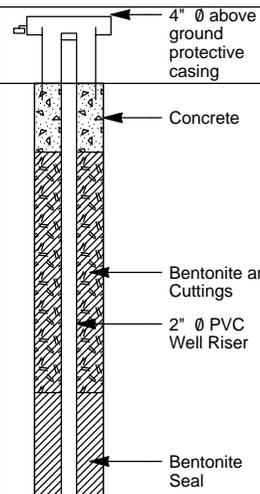
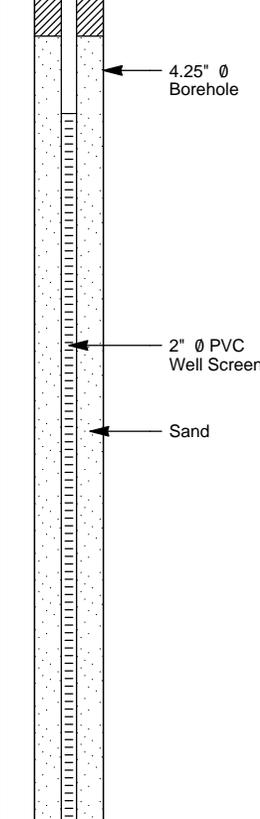
OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-03S
 DATE COMPLETED: May 2, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	594.02 591.54	 <p style="font-size: small;">4" Ø above ground protective casing Concrete Bentonite and Cuttings 2" Ø PVC Well Riser Bentonite Seal</p>				
2	GRAVEL SAND (FILL), trace to with silt, trace to with gravel, fine grained, brown, moist	591.44	 <p style="font-size: small;">4.25" Ø Borehole 2" Ø PVC Well Screen Sand</p>				
10	SM-SAND WITH SILT, fine grained, trace gravel, compact, brown, moist	581.54					
12	CL-SILTY CLAY TILL (silty clay, trace gravel, trace sand), compact, moist, grey	580.54		1		70	25
14	ML-SILT & SAND, trace gravel, very loose to loose, greyish brown, wet	579.54		2		50	9
18	ML-SILT WITH SAND, trace clay, trace gravel, fine grained, very loose, brownish-grey, wet, 0.5" to 2" clay lenses, with silt, trace gravel, trace sand, very loose, wet, brownish-grey	574.54		3		20	6
20				4		20	6
22				5		20	4
24				6		30	18
26				7		15	35
28				8		10	1
30				9		15	7
32				10		5	1
34				11		30	5
36	CL-CLAY TILL (clay, some silt, trace sand and gravel), loose, grey, wet END OF BOREHOLE @ 36.0ft BGS	556.54 555.54		12		100	8
38				13		40	10

WELL DETAILS
 Screened interval:
 576.29 to 555.54ft AMSL
 15.25 to 36.00ft BGS
 Length: 20.75ft

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-03S
 DATE COMPLETED: May 2, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78			Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 578.54 to 555.54ft AMSL 13.00 to 36.00ft BGS Material: #5 Quartz Sand					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

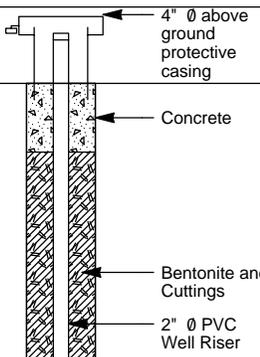
OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-04S
 DATE COMPLETED: May 3, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	593.82 591.01	 <p style="font-size: small;">4" Ø above ground protective casing Concrete Bentonite and Cuttings 2" Ø PVC Well Riser Bentonite Seal 4.25" Ø Borehole Sand 2" Ø PVC Well Screen</p>				
2	SAND & SILT (FILL), trace gravel, trace cobbles, fine grained, brown, dry						
4							
6							
8		583.01					
10	SM-SAND & SILT(FILL), trace clay, trace gravel, loose to compact, fine grained, brown, moist			1		40	1
12	- 3" thick layer of silty clay till (silty clay, trace sand & gravel), compact grey, moist at 11.0ft BGS			2		95	29
14	- getting wet at 12.0ft BGS			3		70	18
16	- thick layer of sandy organic material, very soft, black, wet (no odor presence of roots) at 13.8ft BGS			4		80	35
18				5		100	25
20				6		90	23
22				7		100	24
24				8		55	29
26	- 3" thick layer of silty clay till (silty clay, trace sand & gravel), compact grey, moist at 23.0ft BGS			9		90	41
28	- getting softer (very soft), saturated at 24.0ft BGS			10		65	10
30	- silt with sand, trace clay, compact, brown, wet at 29.0ft BGS			11		80	15
32	- 0.5" x 0.4" diagonal layer of dark grey to black organic material, very loose, fine grained, wet at 30.0ft BGS			12		70	31
34	ML-SILT, trace to with sand, trace clay, loose, grey wet	557.51		13		100	20
36	CL-CLAY TILL (clay with silt, trace sand & gravel), dense, grey, dry	555.21 555.01					
38	END OF BOREHOLE @ 36.0ft BGS						

WELL DETAILS
 Screened interval:
 576.01 to 556.01ft AMSL
 15.00 to 35.00ft BGS
 Length: 20ft

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-04S
 DATE COMPLETED: May 3, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78			Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 578.01 to 556.01ft AMSL 13.00 to 35.00ft BGS Material: #5 Quartz Sand					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

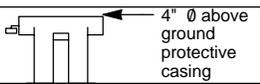
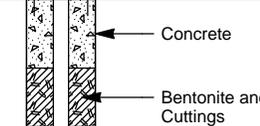
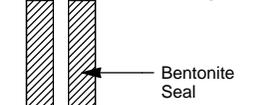
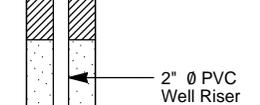
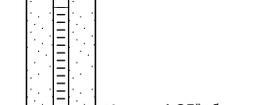
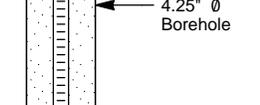
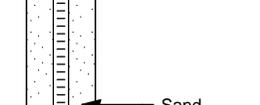
OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-05S
 DATE COMPLETED: May 4, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	588.64 585.72	 4" Ø above ground protective casing					
2	SAND & SILT (FILL), trace gravel, fine grained, brown, dry		 Concrete Bentonite and Cuttings					
4	SM-SAND, trace to some silt, very soft, fine to medium grained, brown, wet	581.72	 Bentonite Seal	1		40	1	3.0
6				2		70	29	4.5
8	GP-GRAVEL & SAND, trace silt, loose to compact, medium to coarse grained, dark brown, wet	578.92 577.72	 2" Ø PVC Well Riser	3		70	18	11
10	SM-SAND, trace silt, compact, fine to medium grained, brown, wet, trace gravel - finer, silt & sand, (4" thick layer, black) at 9.0ft BGS			4		60	35	10.2
12	- finer, silt & sand, (4" thick layer, black) at 11.5ft BGS			5		65	25	9.8
14	- finer, silt & sand, (4" thick layer, black) at 13.0ft BGS		 4.25" Ø Borehole	6		60	23	11
16	- silt, grey at 15.0ft BGS			7		70	24	9.8
18				8		80	29	10.1
20	SP-SAND, trace silt, medium to coarse grained, brown to grey, wet	566.72 565.72	 Sand	9		75	41	10.3
22	SM-SAND, trace silt, compact, fine to medium grained, brown, wet, trace gravel - finer, silt & sand at 21.5ft BGS			10		70	10	9.7
24	CL-CLAY, trace silt, trace sand, trace of brown to black organics, compact, wet	561.72	 2" Ø PVC Well Screen	11		4.5	15	18
26	SP-SAND, medium to coarse grained, grey compact, wet	560.22 559.72		12		80	41	10.1
28	SM-SAND, trace silt, compact, grey, fine grained, wet	558.72		13		50	20	8.4
30	ML-SILT, trace sand, compact, grey, fine grained, moist							
32	END OF BOREHOLE @ 30.0ft BGS	555.72						
34								
36								
38								

WELL DETAILS
 Screened interval:
 575.72 to 555.72ft AMSL
 10.00 to 30.00ft BGS
 Length: 20ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 577.82 to 555.72ft AMSL
 7.90 to 30.00ft BGS
 Material: #5 Quartz Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

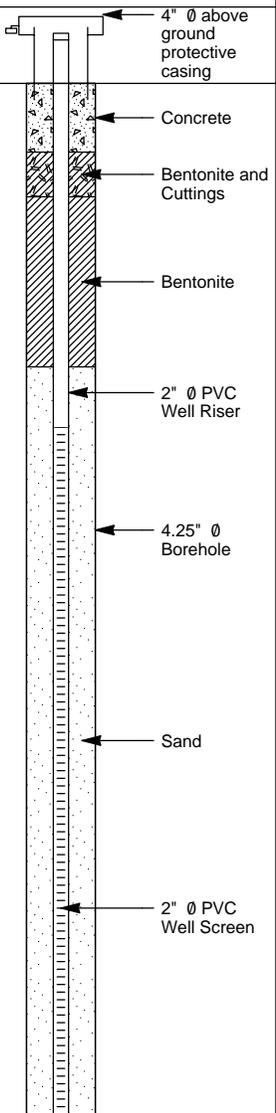
OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-06S
 DATE COMPLETED: May 5, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	592.66 589.78	 <p style="font-size: small;">4" Ø above ground protective casing Concrete Bentonite and Cuttings Bentonite 2" Ø PVC Well Riser 4.25" Ø Borehole Sand 2" Ø PVC Well Screen</p>					
2	SAND with SILT, trace gravel, brown, moist							
4								
6								
8								
10	SM-SAND, some silt, soft, fine, grained, brown, wet	579.78		1		70	18	1.0
12	GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet	578.78						
14	SM-SAND, some silt, soft, fine, grained, brown, wet	577.78		2		60	17	2.0
16	GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet	576.78						
18	SM-SAND, some silt, soft, fine, grained, brown, wet	575.78		3		60	46	1.0
20	GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet	574.78						
22	SM-SAND, some silt, soft, fine, grained, brown, wet	573.78		4		40	40	1.0
24	GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet							
26	ML-SILT, some sand, fine grained, greyish brown, trace gravel, compact to dense, wet			5		70	24	
28				6		60	58	
30	GM-SAND & GRAVEL, trace silt, compact to dense, brown, wet, coarser grained	564.78		7		60	51	
32	ML-SILT, trace sand, brown, dense, fine grained, wet	564.18		8		60	51	
34				9		50	37	
36	CL-CLAY, (clay till, trace silt, trace sand & gravel), gravel well embedded in finer matrix, very dense, grey, moist to dry	560.78		10		70	40	
38	END OF BOREHOLE @ 30.0ft BGS	559.78						

WELL DETAILS
 Screened interval:
 579.78 to 559.78ft AMSL
 10.00 to 30.00ft BGS
 Length: 20ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 581.53 to 559.78ft AMSL
 8.25 to 30.00ft BGS
 Material: #5 Quartz Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

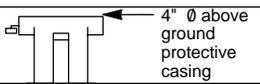
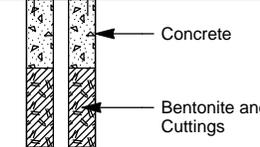
OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-07S
 DATE COMPLETED: May 8, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	589.82 587.08	 <p>4" Ø above ground protective casing</p>				
2	SAND with SILT, trace gravel, fine grained, brown, moist		 <p>Concrete</p>				
4	SM-SAND WITH SILT, trace gravel, very loose, fine grained, brown, wet	583.08	 <p>Bentonite and Cuttings</p>	1		40	0
6	GM-GRAVELLY SAND, trace silt, loose to compact, medium grained, brown, wet	581.08	 <p>Bentonite Seal</p>	2		50	16
8	SM-SAND, trace silt, trace to with gravel, fine to coarse grained, compact, brown, wet	579.08	 <p>2" Ø PVC Well Riser</p>	3		40	25
10	- less gravel at 10.0ft BGS			4		50	50
12	GM-GRAVELLY SAND, trace silt, loose to compact, medium grained, brown, wet	575.58	 <p>4.25" Ø Borehole</p>	5		60	29
14				6		50	56
16	ML-SILT & SAND, loose to compact, fine grained, brown, wet	571.28		7		50	43
18	SW-SAND, coarse grained, compact to dense, brown, wet	570.08 569.58	 <p>Sand</p>	8		70	35
20	ML-SILT & SAND, trace gravel, dense, brown, fine grained, wet			9		50	19
22	ML-SILT, trace sand, compact, grey, wet, fine grained	565.28 565.08		10		50	82
24	SM-SAND & SILT, compact, brown, wet, fine grained	563.58 563.08	 <p>2" Ø PVC Well Screen</p>	11		50	31
26	ML-SILT, trace sand, very dense, grey, wet	562.08		12		80	28
28	SM-SAND & SILT, compact, brown, wet, fine grained	561.08		13		0	50
30	ML-SILT, trace sand, grey, wet, fine grained	560.08					
32	END OF BOREHOLE @ 30.0ft BGS	557.08					

WELL DETAILS
 Screened interval:
 577.08 to 557.08ft AMSL
 10.00 to 30.00ft BGS
 Length: 20ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 579.28 to 557.08ft AMSL
 7.80 to 30.00ft BGS
 Material: #5 Quartz Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

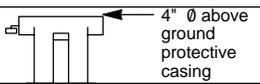
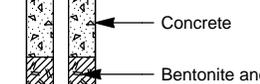
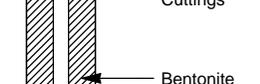
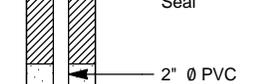
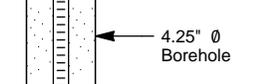
OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-08S
 DATE COMPLETED: May 5, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	588.73 585.85	 <p style="text-align: center;">4" Ø above ground protective casing</p>					
2	SAND, trace silt, trace gravel, trace organics, fine grained, moist		 <p style="text-align: center;">Concrete</p> <p style="text-align: center;">Bentonite and Cuttings</p>					
4			 <p style="text-align: center;">Bentonite Seal</p>					
6	SM-SAND, trace silt, trace gravel, compact, fine to coarse grained, brown, wet	579.85						
8	GP-GRAVEL, trace sand, medium to coarse grained, compact, brown, wet	578.85	 <p style="text-align: center;">2" Ø PVC Well Riser</p>	1		60	25	10.6
10	ML-SILT, trace sand, loose to compact, fine grained, brown, wet	577.85		2		70	13	13.8
12	SM-SAND, trace gravel, medium to coarse grained, loose to compact, brown, wet	576.85		3		85	28	11.6
14	ML-SILT, trace fine sand, brown, compact to dense, wet	574.35 573.85	 <p style="text-align: center;">4.25" Ø Borehole</p>	4		60	11	11.0
16	SM-SAND & SILT, fine to medium grained, very loose to compact, brown, wet	570.35 569.85		5		80	33	9.1
18	ML-SILT, trace sand, compact to dense, fine grained, brown, wet	568.35 567.85		6		70	19	9.7
20	SM-SAND, trace silt, fine to coarse grained, very loose to loose, brown, wet	566.85	 <p style="text-align: center;">Sand</p>	7		60	13	10.4
22	ML-SILT, trace sand, compact, brownish-grey, wet			8		70	54	9.3
24	- SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 21.0ft BGS		 <p style="text-align: center;">2" Ø PVC Well Screen</p>	9		60	24	9.6
26	- SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 23.0ft BGS			10		60	11	10.2
28	- CL, 2" thick layer of clay, trace silt, grey, wet, compact at 25.5ft BGS			11		80	23	10.4
30	- SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 25.9ft BGS	557.85		12			57	--
32	- SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 27.6ft BGS	555.85						
34	ML-SAND & SILT, compact to very dense, fine to coarse grained, brown, wet							
36	END OF BOREHOLE @ 30.0ft BGS							
38								

WELL DETAILS
 Screened interval:
 575.85 to 555.85ft AMSL
 10.00 to 30.00ft BGS
 Length: 20ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 578.15 to 555.85ft AMSL
 7.70 to 30.00ft BGS
 Material: #5 Quartz Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-09S
 DATE COMPLETED: May 3, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	593.84 591.18	<p style="font-size: small;">4" Ø above ground protective casing Concrete Bentonite and Cuttings Bentonite Seal 2" Ø PVC Well Riser 4.25" Ø Borehole Sand 2" Ø PVC Well Screen</p>					
2	SAND WITH SILT (FILL), trace gravel, trace cobbles, fine grained, moist							
4								
6								
8								
10								
	581.18							
	SM-SAND & SILT (FILL), trace gravel, up to 2" diameter trace cobbles, very loose to compact, fine grained, moist to wet			1		75	25	5.2
12				2		20	10	6.0
14				3		5	1	6.0
16				4		90	3	4.0
18				5		50	1	4.0
	573.68							
	GM-GRAVEL WITH SAND (FILL), trace silt, very loose, grey, well rounded gravel, wet							
20								
	571.18							
	END OF BOREHOLE @ 20.0ft BGS							
22	Refusal on Unknown Material							
24								
26								
28								
30								
32								
34								
36								
38								

WELL DETAILS
 Screened interval:
 582.18 to 572.18ft AMSL
 9.00 to 19.00ft BGS
 Length: 10ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 584.43 to 572.18ft AMSL
 6.75 to 19.00ft BGS
 Material: #5 Quartz Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 6/15/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-10
 DATE COMPLETED: July 13, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	593.7 591.0						
2	Vac cleared to 11.0ft BGS							
4	Sand, fine grained, trace to some silt, some gravel, dry to moist, brown							
6								
8								
10								
12	Sand, some silt and gravel, fine grained, loose, dark brown, wet	580.0						0
14	Silty and fine sand, trace gravel, trace clay, loose to compact, lighter brown, moist	579.0						0
16	- saturated at 15.0ft BGS							0
18	- trace organics, black, fine grained at 16.5ft BGS							0
20	- 4" thick layer of silty clay, soft, trace organics, trace silt, trace of gravel embedded within finer matrix at 18.0ft BGS							0
22								0
24	Sand, trace silt, fine to medium grained, loose, grayish brown, wet	568.0						0
26	Silt and fine sand, loose, fine grained, brownish gray, wet	566.0						0
28	Sand, trace gravel, trace silt, loose, brown, wet	564.5						0
30	- compact at 30.0ft BGS							0
32								0
34	Silt, trace sand, compact, fine grained, wet, brownish gray	558.5						0
34	END OF BOREHOLE @ 34.0ft BGS	557.0						0
36								
38								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-10
 DATE COMPLETED: July 13, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78			<u>WELL DETAILS</u> Screened interval: 577.0 to 557.0ft AMSL 14.0 to 34.0ft BGS Length: 20ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 579.0 to 557.0ft AMSL 12.0 to 34.0ft BGS Material: Silica Sand #5					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-11
 DATE COMPLETED: July 14, 2006
 DRILLING METHOD: Vacuum/HSA
 FIELD PERSONNEL: D. NICHOLLS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	589.5 586.5						
2	Vac cleared to 10.0ft BGS							
4	Sand, some gravel, trace of silt, fine grained, brown, moist							
6								
8								
10	- wet at 9.0ft BGS							
12	Sand, trace silt, trace gravel, fine to medium grained, compact, brown, wet	576.5						0
14								0
16	- 7" thick layer of gravel with coarse sand, dense, wet, brown at 16.0ft BGS							0
18	- 8" thick layer of gravel with coarse sand, dense, wet, brown at 17.0ft BGS							0
20	- 6" thick layer of silt, trace sand, dense, fine grained, grayish-brown, wet at 19.5ft BGS							0
22	- 8" thick layer of gravel with coarse sand, dense, wet, brown at 21.0ft BGS							0
24	- 6" thick layer of coarse sand, dense, wet, brown at 23.0ft BGS							0
26	- 6" thick layer of silt, trace sand, dense, fine grained, grayish-brown, wet at 23.5ft BGS							0
28	Silt, trace sand, compact, fine grained, grayish-brown, wet	559.5						0
30	Sand, trace silt, trace gravel, fine to medium grained, compact, brown, wet	558.5						0
32	Silt, trace sand, compact, fine grained, grayish-brown, wet	557.5						0
34	END OF BOREHOLE @ 30.0ft BGS	556.5						0
36								
38								

WELL DETAILS
 Screened interval:
 576.5 to 556.5ft AMSL
 10.0 to 30.0ft BGS
 Length: 20ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 578.5 to 556.5ft AMSL
 8.0 to 30.0ft BGS
 Material: Silica Sand #5

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-100
 DATE COMPLETED: July 7, 2006
 DRILLING METHOD: Geoprobe
 FIELD PERSONNEL: M. BORKOWSKI

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	N' VALUE
	TOP OF RISER GROUND SURFACE	590.0 585.3					
2	(SW) Fine grained sand, dry						
4							
6							
8	(SP) Med-Fine grained sand, saturated	577.8					
10							
12							
14	(SP) Coarse grained sand, larger stones, saturated	571.8					
16							
18							
20							
22	END OF BOREHOLE @ 21.5ft BGS	563.8					
24							
26							
28							
30							
32							
34							
36							
38							

WELL DETAILS
 Screened interval:
 578.8 to 563.8ft AMSL
 6.5 to 21.5ft BGS
 Length: 15ft
 Diameter: 1in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 579.8 to 563.8ft AMSL
 5.5 to 21.5ft BGS
 Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-101
 DATE COMPLETED: July 7, 2006
 DRILLING METHOD: Geoprobe
 FIELD PERSONNEL: M. BORKOWSKI

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	N' VALUE
	TOP OF RISER GROUND SURFACE	588.7 584.3					
2	(SW) Fine grained sand, dry						
4							
6							
8	(SP) Med-Fine grained sand, saturated	576.8					
10							
12							
14	(SP) Coarse grained sand, larger stones, saturated	570.8					
16							
18							
20	END OF BOREHOLE @ 19.0ft BGS	565.3					
22							
24							
26							
28							
30							
32							
34							
36							
38							

WELL DETAILS
 Screened interval:
 580.3 to 565.3ft AMSL
 4.0 to 19.0ft BGS
 Length: 15ft
 Diameter: 1in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 581.3 to 565.3ft AMSL
 3.0 to 19.0ft BGS
 Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-102
 DATE COMPLETED: July 7, 2006
 DRILLING METHOD: Geoprobe
 FIELD PERSONNEL: M. BORKOWSKI

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE						
				NUMBER	INTERVAL	REC (%)	N' VALUE			
	TOP OF RISER GROUND SURFACE	588.6 584.3								
2	(SW) Fine grained sand, dry									
4										
6	(SP) Med-Fine grained sand, saturated									
8										
10										
12	(SP) Coarse grained sand, larger stones, saturated									
14										
16										
18										
20	END OF BOREHOLE @ 21.0ft BGS									
22										
24										
26										
28										
30										
32										
34										
36										
38										

WELL DETAILS
 Screened interval:
 578.3 to 563.3ft AMSL
 6.0 to 21.0ft BGS
 Length: 15ft
 Diameter: 1in
 Slot Size: 10
 Material: PVC
 Sand Pack:
 579.3 to 563.3ft AMSL
 5.0 to 21.0ft BGS
 Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION
 PROJECT NUMBER: 45136-30
 CLIENT: EXELON GENERATION COMPANY LLC
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-103
 DATE COMPLETED: July 7, 2006
 DRILLING METHOD: Geoprobe
 FIELD PERSONNEL: M. BORKOWSKI

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	
	TOP OF RISER GROUND SURFACE	587.5 583.7						
2	(SW) Fine grained sand, dry							
4								
6								
8	(SP) Med-Fine grained sand, saturated	576.2						
10								
12								
14	(SP) Coarse grained sand, larger stones, saturated	570.2						
16								
18								
20								
22								
24								
26								
28								
30	END OF BOREHOLE @ 30.0ft BGS	553.7						
32			<p>WELL DETAILS Screened interval: 573.7 to 553.7ft AMSL 10.0 to 30.0ft BGS Length: 20ft Diameter: 1in Slot Size: 10 Material: PVC Sand Pack: 574.7 to 553.7ft AMSL 9.0 to 30.0ft BGS Material: Sand</p>					
34								
36								
38								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA_CORP.GDT 8/6/06

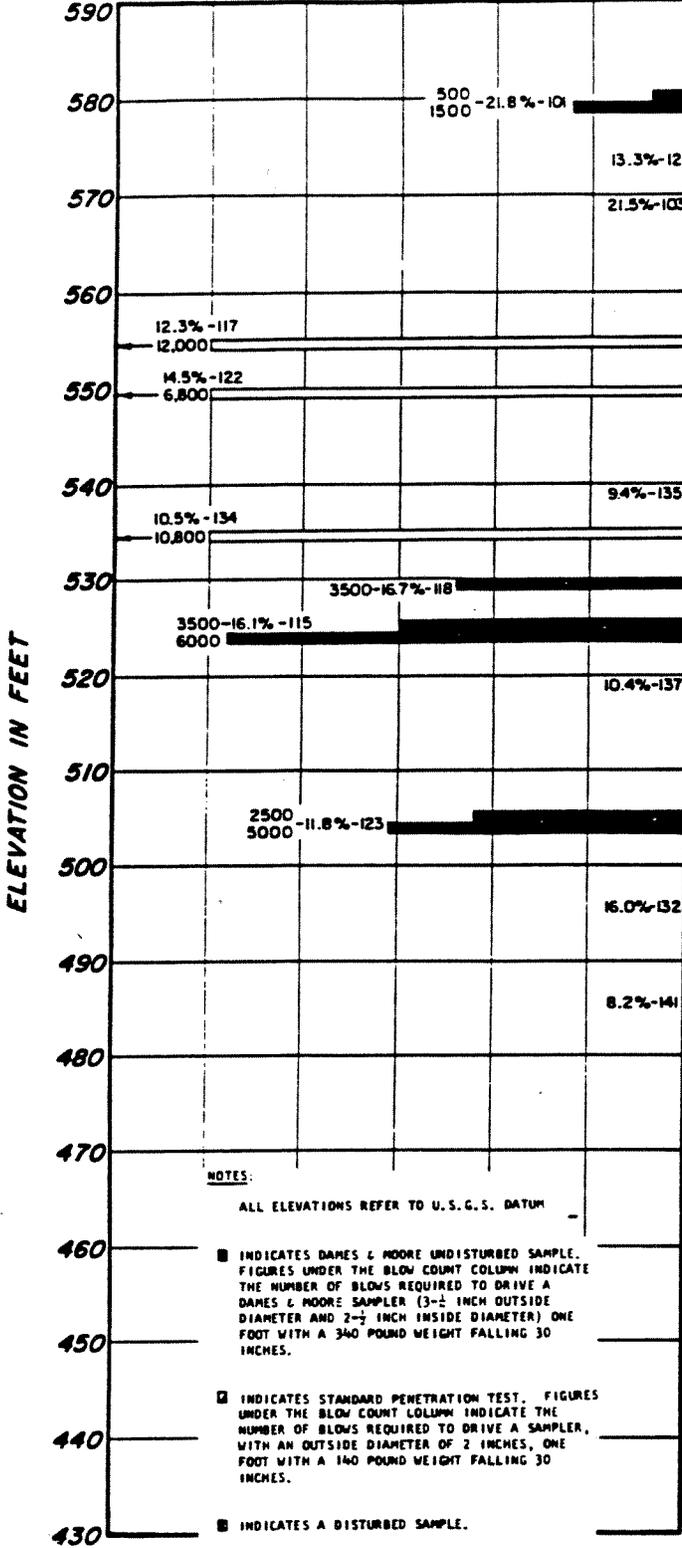
B.2 HISTORICAL GEOTECHNICAL LOGS

SHEARING STRENGTH IN LBS./SQ.FT.

BORING 1

SURFACE ELEVATION 585.22

6000 5000 4000 3000 2000 1000 0



BLOW COUNT SAMPLES

SYMBOLS	DESCRIPTIONS
11	BLACK CLAYEY SILT - TOPSOIL
16	BROWN FINE TO MEDIUM SAND WITH SOME GRAVEL
54	GRADING SOME COARSE SAND AND MORE GRAVEL
60	GRAY FINE TO MEDIUM SAND WITH SOME GRAVEL
28	GRAY FINE SAND
31	GRAY FINE SAND
35	GRAY FINE SAND
90	GRAY SILTY CLAY WITH SAND, GRAVEL, AND OCCASIONAL SILT LENSES
100/4	GRAY SILTY CLAY WITH SILT LENSES
200/5	GRAY SILTY CLAY WITH SAND AND GRAVEL
102	GRAY SILT WITH SOME FINE SAND
100/1	GRAY SILT WITH SOME FINE SAND
100/3	GRAY SILT WITH SOME FINE SAND
100/5	GRAY SILT WITH SOME FINE SAND
104	GRAY CLAYEY SILT WITH SAND AND GRAVEL
50	GRAY FINE TO COARSE SAND AND GRAVEL
50	GRAY SILTY FINE SAND
164	GRAY SILTY FINE SAND
52	LAYER OF FINE SANDY SILT
56	OCCASIONAL LENSES OF CLAYEY SILT
102	GRAY FINE SANDY SILT
80	GRAY SILTY FINE SAND
110	GRAY SANDY SILT WITH GRAVEL AND SOME CLAY
100%	GRAY NIAGARA DOLOMITE - PITTED, FOSSILIFEROUS, CONTAINS OCCASIONAL PYRITE CRYSTALS
100%	MODERATELY FRACTURED VUGS UP TO 1/2" IN DIAMETER (102.0' TO 113.5')
100%	FRACTURED VUGS UP TO 3/4" IN DIAMETER (115.5' TO 118.5') VUGS UP TO 1-1/2" IN DIAMETER (120.0' TO 125.0')
100%	MODERATELY FRACTURED
100%	FRACTURED OCCASIONAL VUGS UP TO 3/4" IN DIAMETER (132.0' TO 134.5') OCCASIONAL VUGS UP TO 1/2" IN DIAMETER (134.5' TO 147.0')
100%	UNFRACTURED
100%	FRACTURED OCCASIONAL VUGS UP TO 1/2" IN DIAMETER (150.0' TO 152.0')
100%	MODERATELY FRACTURED

NOTES:

ALL ELEVATIONS REFER TO U.S.G.S. DATUM

■ INDICATES DAMES & MOORE UNDISTURBED SAMPLE. FIGURES UNDER THE BLOW COUNT COLUMN INDICATE THE NUMBER OF BLOWS REQUIRED TO DRIVE A DAMES & MOORE SAMPLER (3-1/2 INCH OUTSIDE DIAMETER AND 2-1/2 INCH INSIDE DIAMETER) ONE FOOT WITH A 340 POUND WEIGHT FALLING 30 INCHES.

□ INDICATES STANDARD PENETRATION TEST. FIGURES UNDER THE BLOW COUNT COLUMN INDICATE THE NUMBER OF BLOWS REQUIRED TO DRIVE A SAMPLER, WITH AN OUTSIDE DIAMETER OF 2 INCHES, ONE FOOT WITH A 140 POUND WEIGHT FALLING 30 INCHES.

■ INDICATES A DISTURBED SAMPLE.

□ INDICATES A SAMPLING ATTEMPT WITH NO RECOVERY.

100% I INDICATES DEPTH, LENGTH, AND PERCENT OF CORE RUN RECOVERED.

NOMENCLATURE

SEVERELY FRACTURED
FRACTURED
MODERATELY FRACTURED
UNFRACTURED

LENGTH OF CORE PIECES

LESS THAN 3"
3" TO 6"
6" TO 12"
GREATER THAN 12"

DAMES & MOORE

ZION STATION DSAR

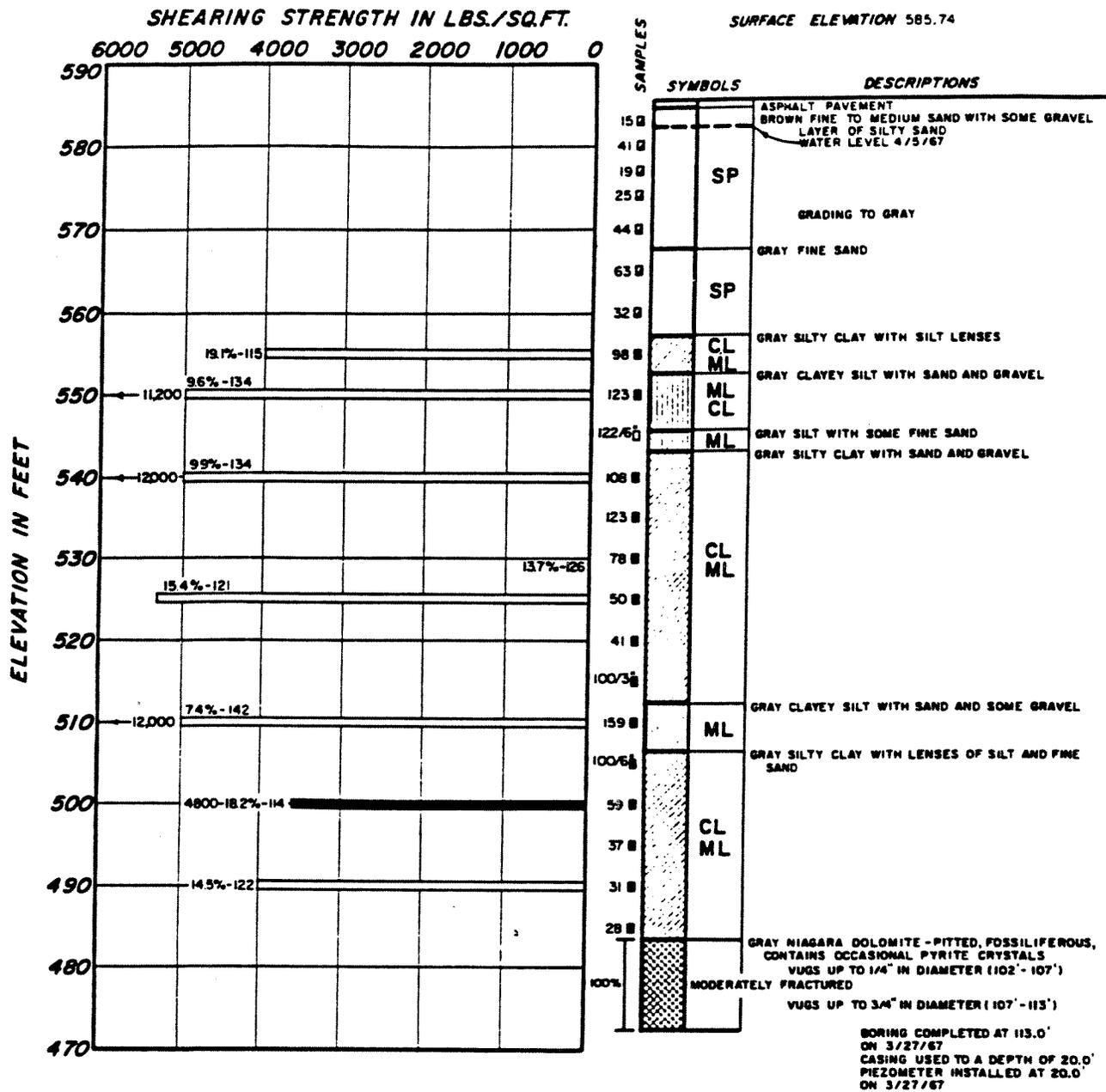
Figure 2-19

LOG OF BORINGS, (BORING 1)

AUGUST 1998

BORING 2

SURFACE ELEVATION 585.74



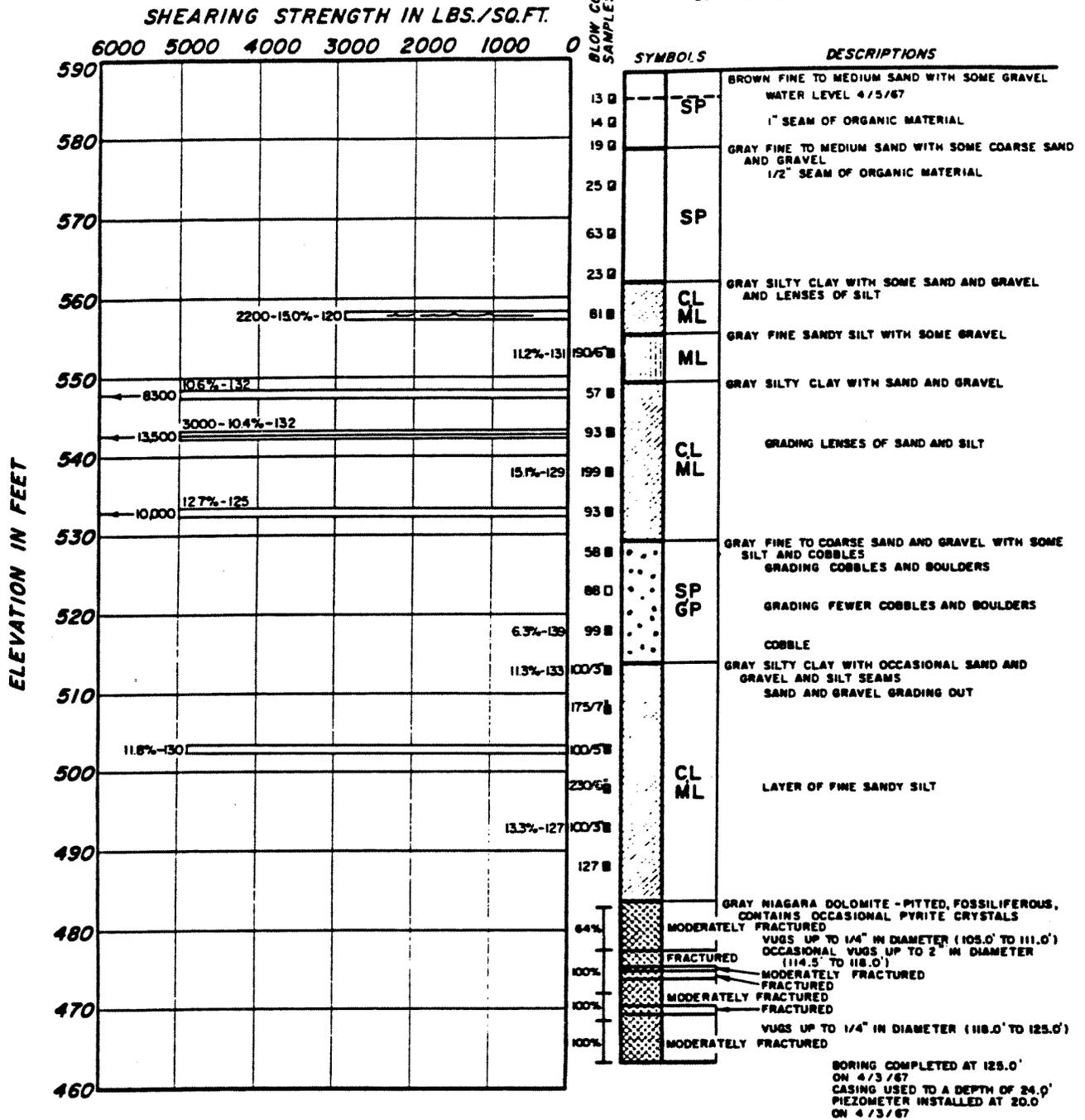
ZION STATION DSAR

Figure 2-20

LOG OF BORINGS, (BORING 2)

AUGUST 1998

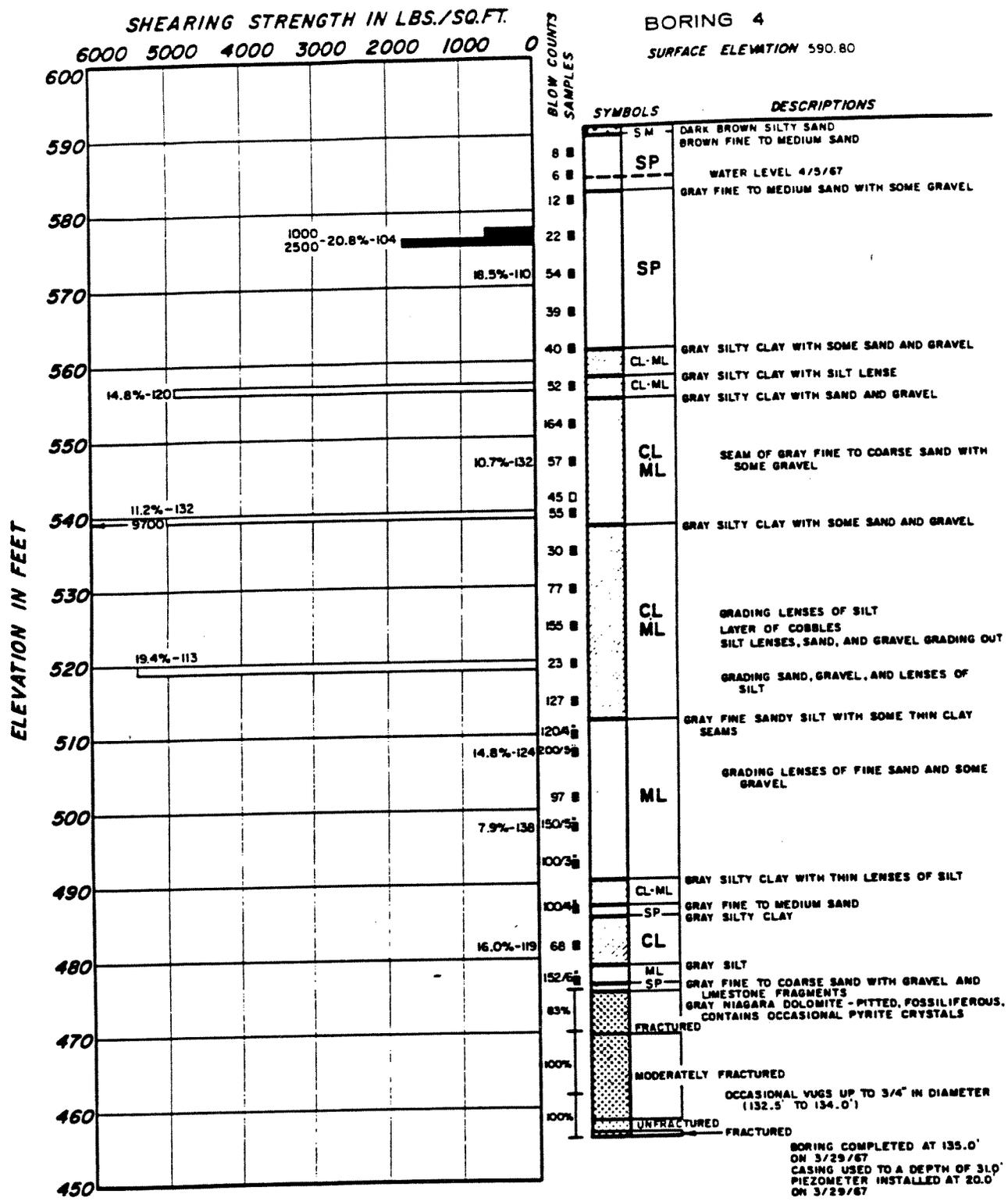
BORING 3
SURFACE ELEVATION 588.14



ZION STATION DSAR

Figure 2-21

LOG OF BORINGS, (BORING 3)



ZION STATION DSAR

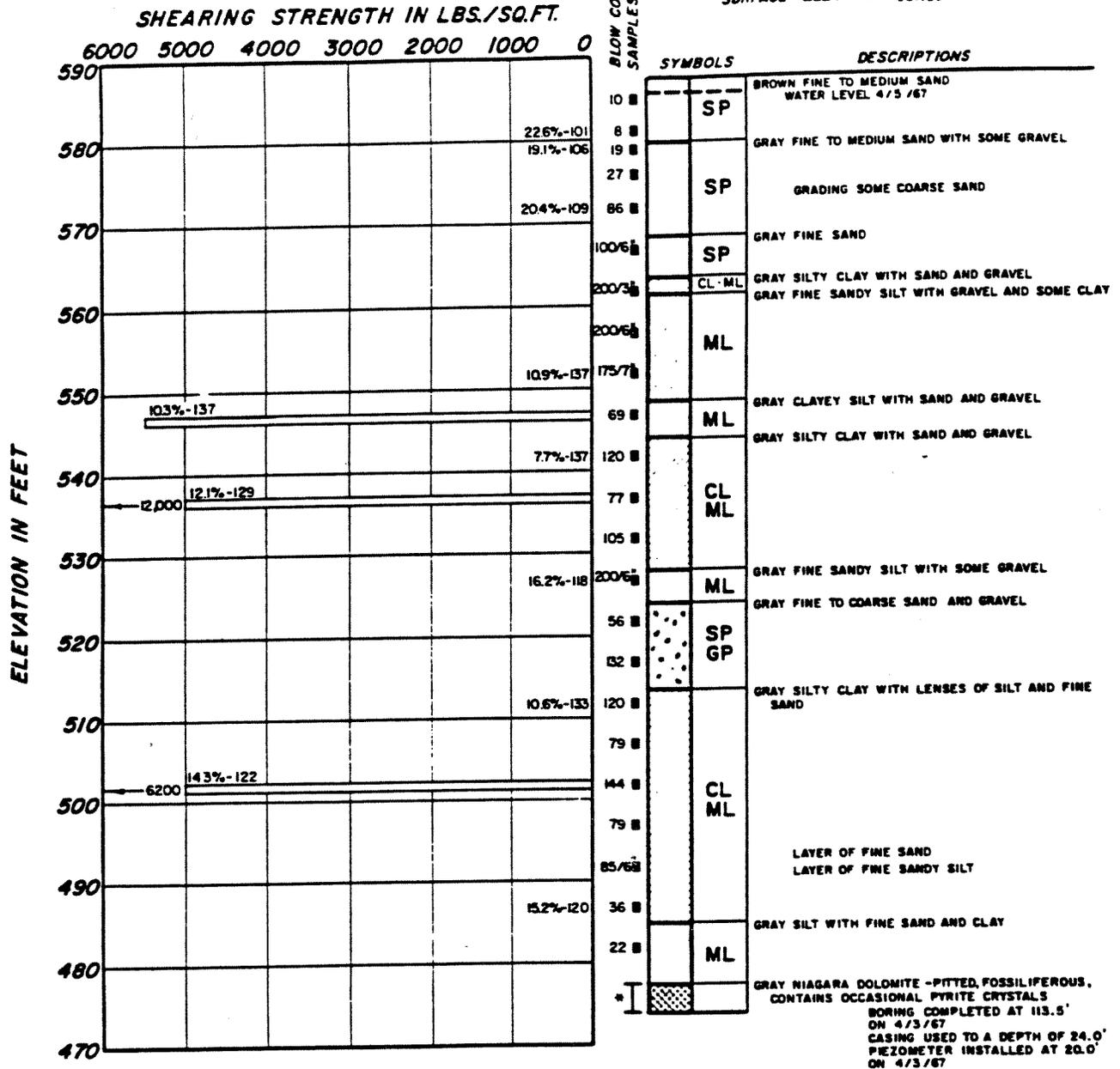
Figure 2-22

LOG OF BORINGS, (BORING 4)

AUGUST 1998

BORING 5

SURFACE ELEVATION 587.39



* CORE BARREL SHEARED OFF IN BORING AND WAS NOT RETRIEVED

ZION STATION DSAR

Figure 2-23

LOG OF BORINGS, (BORING 5)

APPENDIX C

QUALITY ASSURANCE PROGRAM - TELEDYNE BROWN ENGINEERING, INC.

Quality Assurance Manual

For

Teledyne Brown Engineering Environmental Services

2508 Quality Lane

Knoxville, Tennessee 37931-3133

865-690-6819

Generated by:

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Lynne Perry, QA Manager

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Lynne Perry

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10/26/05

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REVISION HISTORY

Revision 7	Complete re-write	January 1, 2005	Bill Meyer
Revision 8	Updated organization chart, minor change to 1.0, 4.4, 7.5.3.2, 10.2.3, and 12.3		

1.0

Knoxville QAM Section Introduction

This Quality Assurance Manual (QAM) and related Procedures describes the Knoxville Environmental Services Laboratory's QA system. This system is designed to meet multiple quality standards imposed by Customers and regulatory agencies including:

- NRC's 10 CFR 50 Appendix B
- NRC's Regulatory Guide 4.15
- DOE's Order 414.1
- DOE's QSAS
- ANSI N 42.23
- ANSI N 13.30
- NELAC Standard, Chapter 5

The Environmental Services (ES) Laboratory does low level radioactivity analyses for Power Plants and other customers. It primarily analyzes environmental samples (natural products from around plants such as milk), in-plant samples (air filters, waters), bioassay samples from customer's employees, and waste disposal samples (liquids and solids).

Potable and non-potable water samples are tested using methods based on EPA standards as cited in State licenses ([see Procedure 4010](#)). The listing [current as of initial printing of this Manual – see current index for revision status and additions / deletions] of implementing Procedures (SOPs) covering Administration, Methods, Counting Instruments, Technical, Miscellaneous, and LIMS is shown in Table 1-1. Reference to these Procedures by number is made throughout this QAM.

Table 1-1

Number	Title
Part 1	Administrative Procedures
1001	Validation and Verification of Computer Programs for Radiochemistry Data Reduction
1002	Organization and Responsibility
1003	Control, Retention, and Disposal of Quality Assurance Records
1004	Definitions
1005	Data Integrity
1006	Job Descriptions
1007	Training and Certifications
1008	Procedure and Document Control
1009	Calibration System
1010	Nonconformance Controls
1011	10CFR21 Reporting
1012	Corrective Action and Preventive Action

Number	Title
1013	Internal Audits and Management Reviews
1014	RFP, Contract Review, and Order Entry (formerly 4001)
1015	Procurement Controls
Part 2	Method Procedures
2001	Alpha Isotopic and Plutonium-241
2002	Carbon-14 Activity in Various Matrices
2003	Carbon-14 and Tritium in Soils, Solids, and Biological Samples; Harvey Oxidizer Method
2004	Cerium-141 and Cerium-144 by Radiochemical Separation
2005	Cesium-137 by Radiochemical Separation
2006	Iron-55 Activity in Various Matrices
2007	Gamma Emitting Radioisotope Analysis
2008	Gross Alpha and/or Gross Beta Activity in Various Matrices
2009	Gross Beta Minus Potassium-40 Activity in Urine and Fecal Samples
2010	Tritium and Carbon-14 Analysis by Liquid Scintillation
2011	Tritium Analysis in Drinking Water by Liquid Scintillation
2012	Radioiodine in Various Matrices
2013	Radionickel Activity in Various Matrices
2014	Phosphorus-32 Activity in Various Matrices
2015	Lead-210 Activity in Various Matrices
2016	Radium-226 Analysis in Various Matrices
2017	Total Radium in Water Samples
2018	Radiostrontium Analysis by Chemical Separation
2019	Radiostrontium Analysis by Ion Exchange
2020	Sulfur-35 Analysis
2021	Technetium-99 Analysis by Eichrom Resin Separation
2022	Total Uranium Analysis by KPA
2023	Compositing of Samples
2024	Dry Ashing of Environmental Samples
2025	Preparation and Standardization of Carrier Solutions
2026	Radioactive Reference Standard Solutions and Records
2027	Glassware Washing and Storage
2028	Moisture Content of Various Matrices
2029	Polonium-210 Activity in Various Matrices
2030	Promethium-147 Analysis

Number	Title
Part 3	Instrument Procedures
3001	Calibration and Control of Gamma-Ray Spectrometers
3002	Calibration of Alpha Spectrometers
3003	Calibration and Control of Alpha and Beta Counting Instruments
3004	Calibration and Control of Liquid Scintillation Counters
3005	Calibration and Operation of pH Meters
3006	Balance Calibration and Check
3008	Negative Results Evaluation Policy
3009	Use and Maintenance of Mechanical Pipettors
3010	Microwave Digestion System Use and Maintenance
Part 4	Technical Procedures
4001	Not Used
4002	QC Checks on Data
4003	Sample Regent and Control
4004	Data Package Preparation and Reporting
4005	Blank, Spike, and Duplicate Controls
4006	Inter-Laboratory Comparison Study Process
4007	Method Basis and Initial Validation Process
4008	Not Used
4009	MDL Controls
4010	State Certification Process
4011	Accuracy, Precision, Efficiency, and Bias Controls and Data Quality Objectives
4012	Not Used
4013	Not Used
4014	Facility Operation and Control
4015	Documentation of Analytical Laboratory Logbooks (formerly 1002)
4016	Total Propagated Uncertainty (formerly 1004)
4017	LIMS Operation
4018	Instrument Calibration System
4019	Radioactive Reference Material Standards
Part 5	Miscellaneous Procedures
5001	Laboratory Hood Operations
5002	Operation and Maintenance of Deionized Water System
5003	Waste Management
5004	Acid Neutralization and Purification System Operation Procedure

Part 6	LIMS
6001	LIMS Raw Data Processing and Reporting
6002	Software Development and/or Pilots of COTS Packages
6003	Software Change and Version Control
6004	Backup of Data and System Files
6005	Disaster Recovery Plan
6006	LIMS Hardware
6007	LIMS User Access
6008	LIMS Training
6009	LIMS Security

2.0 QUALITY SYSTEM

The TBE-ES QA system is designed to comply with multiple customer- and regulatory agency-imposed specifications related to quality. This quality system applies to all activities of TBE-ES that affect the quality of analyses performed by the laboratory.

2.1 Policy

The TBE quality policy, given in Company Policy P-501, is “TBE will continually improve our processes and effectiveness in providing products and services that exceed our customer’s expectations.”

This policy is amplified by this Laboratory’s commitment, as attested to by the title page signatures, to perform all work to good professional practices and to deliver high quality services to our customers with full data integrity. (See Section 4.0 and Procedure 1005).

2.2 Quality System Structure

The Quality System is operated by the organizations described in Section 3.0 of this Manual. The Quality System is described in this Manual and in the Procedures Manual, both of which are maintained by the QA Manager. Procedures are divided into 6 sections – Administrative, Methods, Equipments, Technical, Miscellaneous, and LIMS. This Manual is structured as shown in the Table of Contents and refers to Procedures when applicable. Cross references to the various imposed quality specifications are contained in Appendices to this Manual.

2.3 Quality System Objectives

The Quality System is established to meet the objective of assuring all operations are planned and executed in accordance with system requirements. The Quality System also assures that performance evaluations are performed (see Procedure 4006), and that appropriate verifications are performed (see Procedures in the 1000 and 4000 series) to further assure compliance. Verification includes

examination of final reports (prior to submittal to customers) to determine their quality (see Procedure 4004).

To further these objectives, various in-process assessments of data, as well as assessments of the system, via internal audits and management reviews, are performed. Both internal experts and customer / regulatory agencies perform further assessments of the system and compliance to requirements.

2.4 Personnel Orientation, Training, and Qualification

TBE provides indoctrination and training to employees and performs proficiency evaluation of technical personnel. This effort is described in Section 4.0.

3.0 ORGANIZATION, AUTHORITY, AND RESPONSIBILITY

TBE has established an effective organization for conducting laboratory analyses at the Knoxville Environmental Services Laboratory. The basic organization is shown in Figure 3-1. Detail organization charts with names, authorities, and responsibilities are given in Procedure 1002. Job descriptions are given in Procedure 1006.

This organization provides clearly established Quality Assurance authorities, duties, and functions. QA has the organizational freedom needed to:

- (1) Identify problems
- (2) Stop nonconforming work
- (3) Initiate investigations
- (4) Recommend corrective and preventive actions
- (5) Provide solutions or recommend solutions
- (6) Verify implementation of actions

All Laboratory personnel have the authority and resources to do their assigned duties and have the freedom to act on problems. The QA personnel have direct, independent access to Company management as shown in Figure 3-1.

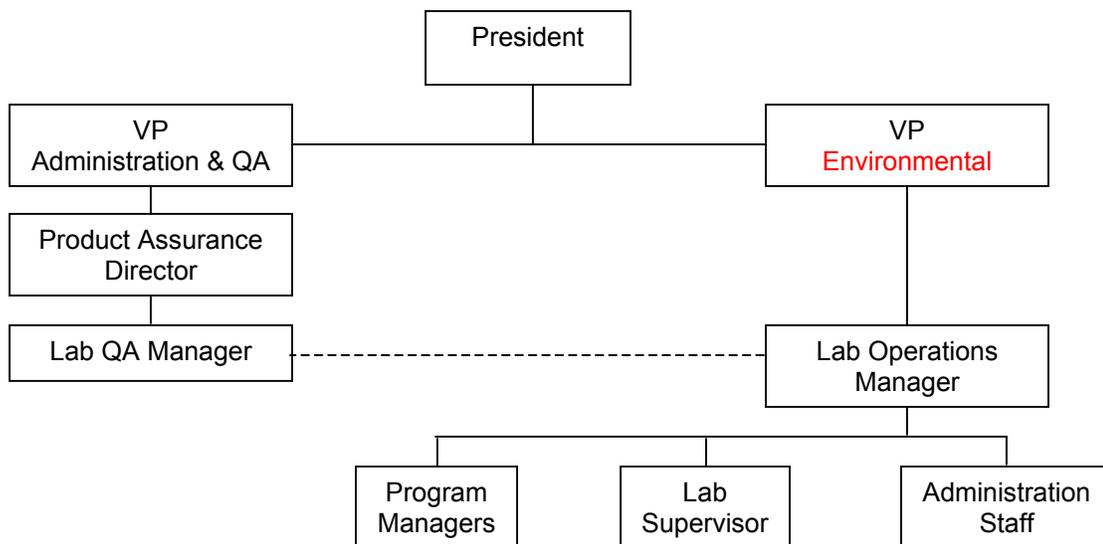


Figure 3.1. Laboratory Organization

4.0 PERSONNEL ORIENTATION, DATA INTEGRITY, TRAINING, AND QUALIFICATION

4.1 Orientation

All laboratory personnel must receive orientation to the quality program if their work can affect quality. Orientation includes a brief review of customer- and regulatory agency-imposed quality requirements, the structure of the QAM, and the implementing procedures. The goal of orientation is to cover the nature and goals of the QA program.

4.2 Data Integrity

The primary output of the Laboratory is data. Special emphasis and training in data integrity is given to all personnel whose work provides or supports data delivery. The Laboratory Data Integrity Procedure (Procedure 1005) describes training, personnel attestations, and monitoring operations. Annual reviews are required.

4.3 Training

The Quality Assurance Manager (QAM) maintains a training matrix indicating which laboratory personnel need training in which specific Procedures. This matrix is updated when personnel change or change assignments. All personnel are trained per these requirements and procedures. This training program is described in Procedure 1007. The assigned responsibilities for employees are described in Procedure 1002 (See Section 3.0) on Organization and in Procedure 1006, Job Descriptions. Refresher training or re-training is given annually as appropriate.

4.4 Qualification

Personnel are qualified as required by their job description. Management and non-analysts are evaluated based on past experience, education, and management's assessment of their capabilities. Formal qualification is required of analysts and related **technical** personnel who perform laboratory functions. Each applicable person is given training and then formally evaluated by the Operations Manager (or his designees) and by QA. Each analyst must initially demonstrate capability to perform each assigned analytical effort. Each year, thereafter, he or she must perform similar analyses on Interlab Comparison Samples (see Procedure 4006) or on equivalent blanks and spikes samples. Acceptable results extend qualifications (certification). Unacceptable results require retraining in the subject method / Procedures. (See Procedure 1007 for added information, records, forms, etc. used.)

4.5 Records

Records of training subjects, contents, attendees, instructors, and certifications are maintained by QA.

5.0 CUSTOMER INTERFACES

5.1 Interface Personnel

The Laboratory has designated Program Managers as the primary interface with all customers. Other interfaces may be the QA Manager or the Lab Operations Manager.

5.2 Bid Requests and Tenders

The Program Managers respond to customer requests for bids and proposals per Procedure 1014 for bids, proposals, and contract reviews. They clarify customer requests so both the customer and the lab staff understand requests. As responses are developed, internal reviews are conducted to ensure that requirements are adequately defined and documented and to verify that the Laboratory has adequate resources in physical capabilities, personal skills, and technical information to perform the work. Accreditation needs are reviewed. If subcontracts are required to perform any analysis, the subcontractor is similarly evaluated and the client notified in writing of the effort. Most qualifications are routine with standard pricing and the review of these quotes is performed by the Program Manager. Larger or more complex quotes are reviewed by the Operations Manager and the QA Manager (or designees). Evidence of review is by initialing and dating applicable papers, signatures on quotations, or by memo.

5.3 Contracts

The Program Manager's receive contract awards (oral or written) and generate the work planning for initiation preparation (charge numbers, data structure or contents in LIMS, etc.). They review contracts for possible differences from quotations and, if acceptable, contracts are processed. Documentation of the review is by initials and date as a minimum. Contract changes receive similar reviews and planning.

5.4 TBE's Expectation of Customers

TBE expects customers to provide samples suitable for lab analysis. These expectations include:

- Accurate and unambiguous identification of samples
- Proper collection and preservation of samples
- Use of appropriate containers free from external and internal contamination
- Integrity preservation during shipment and timely delivery of samples that are age sensitive
- Adequate sized samples that allow for retest, if needed
- Specification of unique MOA/MDC requirements
- Alerting the lab about abnormal samples (high activity, different chemical contents, etc.)
- Chain of custody initiation, when required.

5.5 Customer Satisfaction

TBE's quality policy centers on customer satisfaction (See 2.0). TBE will work to satisfy customers through full compliance with contract requirements, providing accurate data and properly responding to any questions or complaints. Customers are provided full cooperation in their monitoring of Laboratory performance. Customers are notified if any applicable State Accreditation is withdrawn, revoked, or suspended.

5.5.1 Customer Complaints

Any customer complaints are documented and tracked to closure. Most complaints concern analysis data and are received by Program Managers. They log each such complaint, order retests for verification, and provide documented results to customers. Complaints may also be received by QA or Operations.

If complaints are other than re-test type, the nonconformance and corrective action systems (Sections 12 and 13) are used to resolve them and record all actions taken.

5.5.2 Customer Confidentiality

All laboratory personnel maintain confidentiality of customer-unique information.

6.0 DOCUMENTATION GENERATION & CONTROL

6.1 General

The documentation generation and control system is detailed in Procedure 1008. An overview is given below. The basic quality system documents are described in Section 2.0.

6.2 New Documentation

Each Procedure and this QAM is written by appropriate personnel, validated if applicable (see Section 7.0), reviewed for adequacy, completeness, and correctness, and, if acceptable, accepted by the authorized approver [QA Manager, Operations Manager (or their designee)]. Both approvals are required if a Procedure affects both QA and Operations. (See Responsibilities in Section 3.0). These procedures control the quality measurements and their accuracy.

Each document carries a unique identification number, a revision level, dates, page numbers and total page count, and approver identification and sign off. If TBE writes code for software, the software is version identified and issued after Verification and Validation per Section 7.0.

6.3 Documentation Changes

Each change is reviewed in the same manner and by the same people as new documentation. Revision identifications are updated and changes indicated by side bars, italicized words, or by revision description when practical. Obsolete revisions are maintained by QA after being identified as obsolete.

6.4 Documentation Lists and Distributions

Computer indexes of documents are maintained by Quality showing the current authorized revision level of each document. These revisions are placed on the Laboratory server and obsolete ones are removed so that all personnel have only the current documents. If hard copies are produced and distributed, separate distribution lists are maintained indicating who has them and their revision level(s). Copies downloaded off the server are uncontrolled unless verified by the user (on the computer) to be the latest revision.

6.5 Other Documentation

In addition to TBE-generated documentation, QA maintains copies of applicable specifications, regulations, and standard methods.

6.6 Documentation Reviews

Each issued document is reviewed at least every third year by the approving personnel. This review determines continued suitability for use and compliance with requirements.

7.0 DESIGN OF LABORATORY CONTROLS

7.1 General

The Laboratory and its operating procedures are designed specifically for low level (environmental and in-plant) radioactive sample analysis. The various aspects of the laboratory design include the following which are discussed in subsequent paragraphs of this Section:

- (a) Facility
- (b) Technical Processes and Methods
- (c) Verification of Design of Processes, Methods, and Software.
- (d) Design of Quality Controls
- (e) Counting Instrument Controls

7.2 Facility

The facility was designed and built in 2000 to facilitate correct performance of operations in accordance with good laboratory practices and regulatory requirements. It provides security for operations and samples. It separates sample storage areas based on activity levels, separates wet chemistry from counting instrumentation for contamination control, and provides space and electronic systems for documentation, analysis, and record storage. Procedure 4014 describes the facility, room uses, layouts, etc.

7.3 Technical Processes and Methods

7.3.1 Operational Flow

The laboratory design provides for sample receipt and storage (including special environmental provisions for perishable items) where samples are received from clients and other labs (see Section 9.0). The samples are logged into the computer based Laboratory Information Management System (LIMS) and receive unique identification numbers and bar code labels. (See Procedure 4017 for LIMS description and user procedures). The Program Managers then plan the work and assure LIMS contains any special instructions to analysts. Samples then go to sample preparation, wet chemistry (for chemical separation), and counting based on the radionuclides. See Procedures in the 2000 and 3000 series. Analysts perform the required tasks with data being entered into logbooks, LIMS, and counting equipment data systems as appropriate. Results are collected and reviewed by the Operations Manager and Program Managers and reports to clients are generated (See Section 14.0). All records (electronic or hard copy) are maintained in files or in back-up electronic copies (see Section 15.0). After the required hold periods and client notification and approval, samples are disposed of in compliance with regulatory requirements (see Procedures 5003 and 5004).

7.3.2 Methods

The laboratory methods documented in the 2000 and 3000 series of Procedures were primarily developed by senior TBE laboratory personnel based on years of experience at our prior facility in New Jersey. They have been improved, supplemented and implemented here. Where EPA or other accepted national methods exist (primarily for water analyses under State certification programs - see Procedure 4010), the TBE methods conform to the imposed requirements or State accepted alternate requirements. Any method modifications are documented and described in the Procedure. There are no nationally recognized methods for most other analysis methods but references to other method documents are noted where applicable.

7.3.3 Data Reduction and Analysis

Whenever possible automatic data capture and computerized data reduction programs are used. Calculations are either performed using commercial software (counting system operating systems) or TBE developed and validated software is used (see 7.4 below). Analysis of reduced data is performed as described in Section 14.0 and Procedure 4004.

7.4 Verification of Technical Processes, Methods, and Software

7.4.1 Operational Flow Verification

The entire QA Manual and related procedures describe the verification of elements of the technical process flow and the establishment of quality check points, reviews, and controls.

7.4.2 Method Verifications

Methods are verified and validated per Procedure 4007 prior to use unless otherwise agreed to by the client. For most TBE methods initial validation occurred well in the past. New or significantly revised Methods receive initial validation by demonstration of their performance using known analytes (NIST traceable) in appropriate matrices. Sufficient samples are run to obtain statistical data that provides evidence of process capability and control, establishes detection levels (see procedure 4009), bias and precision data (see Procedure 4011). All method procedures and validation data are available to respective clients. Also see Section 7.5 below for the Demonstration of Capability program.

7.4.3 Data Reduction and Analysis Verification

Data reduction and analysis verification is performed by personnel who did not generate the data. (See Section 14.0).

7.5 Design of Quality Controls

7.5.1 General

There are multiple quality controls designed into the laboratory operations. Many of these are described elsewhere in this manual and include personnel qualification (Section 4.0), Document control (6.0), Sample identification and control (9.0), Use of reference standards (10.0), intra- and inter- laboratory tests (10.0), etc. This Section describes the basic quality control systems used to verify Method capability and performance.

7.5.2 Demonstration of Capability (D of C)

The demonstration of capability system verifies and documents that the method, analyst, and the equipment can perform within acceptable limits. The D of C is certified for each combination of analyte, method, and instrument type. D of C's are certified based on objective evidence at least annually. This program is combined with the analyst D of C program (See Section 4.0). Initial D of C's use the method validation effort as covered above. Subsequent D of C's use Inter-Laboratory samples (Procedure 4006) or, if necessary, laboratory generated samples using NIST traceable standards. If results are outside of control limits, re-demonstration is required after investigation and corrective action is accomplished (See Sections 12.0 and 13.0)

7.5.3 Process Control Checks

Process control checks are designed to include Inter-Lab samples, Intra-lab QC check samples, and customer provided check samples. 10% of laboratory analysis samples are for process control purposes.

7.5.3.1 Inter- Lab Samples. Inter-lab samples are procured or obtained from sources providing analytes of interest in matrices similar to normal client samples. These samples may be used for Demonstration of Capability of analyst's, equipment and methods. They also provide for independent insight into the lab's process capabilities. Any value reported as being in the warning zone (over 2 sigma) is reviewed and improvements taken. Any value failing (over 3 sigma) is documented on an NCR and formal investigation per Section 12.0 and 13.0 is performed. If root causes are not clearly understood and fixed, re-tests are required using lab prepared samples (See Procedure 4006).

7.5.3.2 QC Samples. QC samples, along with Inter-lab samples and customer check samples, are 10% of the annual lab workload for the applicable analyte and method. If batch processing is used, some specifications require specific checks with each batch or each day rather than as continuous process controls. (See Procedure 4005)

QC samples consist of multiple types of samples including:

- (a) Method blanks
- (b) Blank spikes
- (c) Matrix spikes

- (d) Duplicates
- (e) Tracers and carriers

Acceptance limits for these samples are given in Procedures or in lab standards. The number, frequency, and use of these sample types varies with the method, matrix, and supplemental requirements. The patterns of use versus method and the use of the resulting test data is described in Procedure 4005.

7.5.3.3 Customer Provided Check Samples. Customers may provide blind check samples and duplicates to aid in their evaluation of the Laboratory. When the lab is notified that samples are check samples their results are included in the QC sample percentage counts. Any reported problems are treated as formal complaints and investigated per Section 5.

7.6 Counting Instrument Controls

The calibration of instruments is their primary control and is described in Section 11.0. In addition, counting procedures (3000 series) also specify use of background checks (method blank data is not used for this) to evaluate possible counting equipment contamination. Instrument calibration checks using a lab standard from a different source than the one used for calibration are also used. Background data can be used to adjust client and test data. Checks with lab standards indicate potential calibration changes.

8.0 PURCHASING AND SUBCONTRACT CONTROLS

8.1 General

Procurement and Subcontracts efforts use the Huntsville-based Cost Point computer system to process orders. The Laboratory-generated Purchase Requisitions are electronically copied into Purchase Orders in Huntsville. The Laboratory also specifies sources to be used. Procured items and services are received at the Laboratory where receiving checks and inspections are made. Laboratory Procedure 1015 provides details on the procurement control system at the Laboratory and references the Huntsville procedures as applicable.

8.2 Source Selection

Sources for procurements of items and services are evaluated and approved by QA as described in Procedure 1015. Nationally recognized catalog item sources are approved by the QA Manager based on reputation. Maintenance services by an approved distributor or the equipment manufacturing company are pre-approved. Sources for other services are evaluated by QA, based on service criticality to the quality system, by phone, mail out, or site visit.

Subcontract sources for laboratory analysis services are only placed with accredited laboratories (by NELAP, NUPIC, State, Client, etc.) as applicable for the type of analysis to be performed. QA maintains lists of approved vendors and records of evaluations performed.

8.3 Procurement of Supplies and Support Services

8.3.1 Catalog Supplies

The Laboratory procures reagents, processing chemicals, laboratory “glassware,” consumables, and other catalog items from nationally known vendors and to applicable laboratory grades, purities, concentrations, accuracy levels, etc. Purchase Requisitions for these items specify catalog numbers or similar call-outs for these off-the-shelf items. Requisitions are generated by the personnel in the lab needing the item and are approved by the Operations or Production Manager. Reagents are analytical reagent grade only.

8.3.2 Support Services

Purchase Requisitions for support services (such as balance calibration, equipment maintenance, etc.) are processed as in 8.3.1 but technical requirements are specified and reviewed before approvals are given.

8.3.3 Equipment and Software

Purchase Requisitions for new equipment, software programs, and major facility modifications affecting the quality system are reviewed and approved by the Operations Manager and the QA Manager.

8.4 Subcontracting of Analytical Services

When necessary, the Laboratory may subcontract analytical services required by a client. This may be because of special needs, infrequency of analysis, etc. Applicable quality and regulatory requirements are imposed in the Purchase Requisition and undergo a technical review by QA. TBE reserves the right of access by TBE and our client for verification purposes.

8.5 Acceptance of Items or Services

Items and services affecting the quality system are verified at receipt based on objective evidence supplied by the vendor. Supply items are reviewed by the requisitioner and, if acceptable, are accepted via annotation on the vendor packing list or similar document. Similarly, equipment services are accepted by the requisitioning lab person. Calibration services are accepted by QA based on certification reviews. (See Section 11.0.)

Data reports from analytical subcontractors are evaluated by Program Managers and subsequently by the Operations Manager (or designee) as part of client report reviews.

Items are not used until accepted and if items or services are rejected, QA is notified and nonconformance controls per Section 12.0 are followed. Vendors may be removed from the approved vendor's list if their performance is unacceptable.

9.0 TEST SAMPLE IDENTIFICATION AND CONTROL

9.1 Sample Identification

Incoming samples are inspected for customer identification, container condition, chain of custody forms, and radioactivity levels. If acceptable, the sample information is entered into LIMS which generates bar coded labels for attachment to the sample(s). The labels are attached and samples stored in the assigned location. If environmental controls are needed (refrigeration, freezing, etc.), the samples are placed in these storage locations. If not acceptable, the Program Manager is notified, the customer contacted, and the problem resolved (return of sample, added data receipts, etc.). See Procedure 4003 for more information on sample receipt.

9.2 LIMS

The LIMS is used to schedule work, provide special information to analysts, and record all actions taken on samples. See Procedure 4017 and the 6000 series of procedures for more information on LIMS operations.

9.3 Sample Control

The sample, with its bar coded label, is logged out to the applicable lab operation where the sample is processed per the applicable methods (Procedures 2000 and 3000). The LIMS-assigned numbers are used for identification through all operations to record data. Data is entered into LIMS, log books (kept by the analysts) or equipment data systems to record data. The combination of LIMS, logbooks, and equipment data systems provide the Chain of Custody data and document all actions taken on samples. Unused sample portions are returned to its storage area for possible verification use. Samples are discarded after required time limits are passed and after client notification and approval, if required.

10.0 SPECIAL PROCESSES, INSPECTION, AND TEST

10.1 Special Processes

The Laboratory's special processes are the methods used to analyze a sample and control equipment. These methods are defined in Procedures in the 2000 and 3000 series. These processes are performed to the qualified methods (see Section 7.0) by qualified people (see 4.0).

10.2 Inspections and Tests

The quality of the process is monitored by indirect means. This program involves calibration checks on counting equipments (see Section 11.0), intra-laboratory checks, and inter-laboratory checks. In addition, some customers submit quality control check samples (blinds, duplicates, external reference standards). All generated data gets independent reviews.

10.2.1 Intra Laboratory Checks (QC Checks)

The quantity and types of checks varies with the method, but basic checks which may include blanks, spiked blanks, matrix spikes, matrix spike duplicates, and duplicates are used as appropriate for customer samples. This process is described in Procedure 4005 and in Section 7.0.

10.2.2 Inter Laboratory Checks

TBE participates in Inter-lab performance evaluation (check) programs with multiple higher level labs. These programs provide blind matrices for the types of matrix/analyte combinations routinely processed by the Lab, if available. This program is described in Procedure 4006.

10.2.3 Data Reviews

Raw data and reports are reviewed by the Operations Manager, or designees. This review checks for data logic, expected results, procedure compliance, etc. (See Section 14.0).

10.3 Control of Sampling of Samples

Samples for analysis are supplied by customers preferably in quantities sufficient to allow re-verification analyses if needed. The samples are prepared for analysis by analysts and then an aliquot (partial sample extraction) is taken from the homogeneous customer sample for the initial analysis. Methods specify standard volumes of sample material required. Sampling data is recorded in LIMS and/or logbooks.

10.4 Reference Standards / Material

10.4.1 Weights and Temperatures

Reference standards are used by the Laboratory's calibration vendor to calibrate the Labs working instruments measuring weights and thermometers.

10.4.2 Radioactive Materials

Reference radioactive standards, traceable to NIST, are procured from higher level laboratories. These reference materials are maintained in the standards area and are diluted down for use by laboratory analysts. All original and diluted volumes are fully traceable to source, procedure, analyst, dilution, and acquisition dates. See Section 11.0 and Procedure 1009.

11.0 EQUIPMENT MAINTENANCE AND CALIBRATION

11.1 General

There are two types of equipment used by the Laboratory: support equipment (scales, glassware, weights, thermometers, etc.) and instruments for counting. Standards traceable to NIST are used for calibration and are of the needed accuracy for laboratory operations. Procedures 1009, 4018, and 4019 describe the calibration and maintenance programs.

11.2 Support Equipment

Analytical support equipment is purchased with the necessary accuracies and appropriate calibration data. If needed, initial calibration by the Laboratory or its calibration vendor is performed. Recalibration schedules are established and equipment recalibrated by the scheduled date by a calibration vendor or by Laboratory personnel. Maintenance is performed, as needed, per manufacturer's manuals or lab procedures.

In addition to calibrations and recalibrations, checks are made on the continued accuracy of items as described in Procedure 1009. Records are maintained of calibration and specified checks.

11.3 Instruments

Instruments receive initial calibration using radioactive sources traceable to NIST. The initial calibration establishes statistical limits of variation that are used to set control limits for future checks and recalibration. This process is described in Procedure 4018. Instruments are maintained per Instrument Manual requirements. Recalibrations are performed per the Procedure.

Between calibrations, check sources are used to assure no significant changes have occurred in the calibration of items. Background checks are performed to check for possible radioactive contamination. Background values are used to adjust sample results. Hardware and software are safeguarded from adjustments that could invalidate calibrations or results.

11.4 Nonconformances and Corrective Actions

If calibrations or checks indicate a problem, the nonconformance system (Section 12.0) and corrective action system (Section 13.0) are initiated to document the problem and its resolution. Equipment is promptly removed from service if questionable.

11.5 Records

Records of calibrations are maintained. Calibration certificates from calibration vendors are maintained by QA. Other calibration data and check data is maintained in log books, LIMS, or instrument software as appropriate and as described in Procedures 1009, 4018, and 4019.

12.0 NONCONFORMANCE CONTROLS

12.1 General

The nonconformance control system is implemented whenever a nonconforming condition on any aspect of Laboratory analysis, testing, or results exist. The system takes graded actions based on the nature and severity of the nonconformance. Nonconforming items or processes are controlled to prevent inadvertent use. Nonconformances are documented and dispositioned. Notification is made to affected organizations, including clients. Procedure 1010 describes the procedures followed. Sample results are only reported after resolution.

12.2 Responsibility and Authority

Each Laboratory employee has the responsibility to report nonconformances and the authority to stop performing nonconforming work or using nonconforming equipment. Laboratory supervision can disposition and take corrective actions on minor problems. Any significant problem is documented by QA using the Laboratory's NCR system per Procedure 1010. QA conducts or assures the conduct of cause analyses, disposition of items or data, and initiation of corrective action if the nonconformance could recur.

12.3 10CFR21 Reporting

The QA Manager reviews NCRs for possible need of customer and/or NRC notification per the requirements of 10CFR21. Procedure 1011 is followed in this review and for any required reporting.

13.0 CORRECTIVE AND PREVENTIVE ACTIONS

13.1 General

The Laboratory takes corrective actions on significant nonconformances (see Section 12.0). It also initiates preventive and improvement actions per the Company Quality Policy (see Section 2.0). The procedures for Corrective Action/Preventive Action systems are contained in Procedure 1012.

13.2 Corrective Actions

Corrective actions are taken by Operations and Quality to promptly correct significant conditions adverse to quality. The condition is identified and cause analysis is performed to identify root causes. Solutions are evaluated and the optimum one selected that will prevent recurrence, can be implemented by the Laboratory, allows the Laboratory to meet its other goals, and is commensurate with the significance of the problem. All steps are documented, action plans developed for major efforts, and reports made to Management. QA verifies the implementation effectiveness. Procedure 1012 provides instructions and designates authorities and responsibilities.

13.3 Preventive Actions

Preventive actions are improvements intended to reduce the potential for nonconformances. Possible preventive actions are developed from suggestions from employees and from analysis of Laboratory technical and quality systems by management. If preventive actions or improvements are selected for investigation, the issues, investigation, recommendations, and implementation actions are documented. Follow up verifies effectiveness.

14.0 RESULTS ANALYSIS AND REPORTING

14.1 General

The Laboratory's role is to provide measurement-based information to clients that is technically valid, legally defensible, and of known quality.

14.2 Results Review

The results obtained from analytical efforts are collected and reviewed by the Operations Manager and the Program Manager. This review verifies the reasonableness and consistency of the results. It includes review of sample and the related QC activity data. Procedure 4002 describes the process. Any deficiencies are corrected by re-analyses, recalculations, or corrective actions per Sections 12.0 and 13.0. Use of the LIMS with its automatic data loading features (see Procedure 4017) minimizes the possibility of transcription or calculation errors.

14.3 Reports

Reports range from simple results reporting to elaborate analytical reports based on the client requirements and imposed specifications and standards. (See Procedure 4004.) Reports present results accurately, clearly, unambiguously, objectively, and as required by the applicable Method(s). Reports include reproduction restrictions, information on any deviations from methods, and any needed data qualifiers based on QC data. If any data is supplied by analytical subcontractors (see Section 8.0), it is clearly identified and attributed to that Laboratory by either name or accreditation number.

If results are faxed or transmitted electronically, confidentiality statements are included in case of receipt by other than the intended client.

Reports are approved by the Program Manager and Operations Manager and record copies kept in file (See Section 15.0).

15.0 RECORDS

15.1 General

The Laboratory collects generated data and information related to quality or technical data and maintains them as records. Records are identified, prepared, reviewed, placed in storage, and maintained as set forth in Procedure 1003.

15.2 Type of Records

All original observations, calculations, derived data, calibration data, and test reports are included. In addition QA data such as audits, management reviews, corrective and preventive actions, manuals, and procedures are included.

15.3 Storage and Retention

Records are stored in files after completion in the lab. Files are in specified locations and under the control of custodians. Filing systems provide for retrieval. Electronic files are kept on Company servers (with regular back up) or on media stored in fireproof file cabinets. Records are kept in Laboratory files for at least 2 years after the last entry and then in Company files for another year as a minimum. Some customers specify larger periods – up to 7 years – which is also met. Generic records supporting multiple customers are kept for the longest applicable period.

15.4 Destruction or Disposal

Records may be destroyed after the retention period and after client notification and acceptance, if required. If the Laboratory closes, records will go in to company storage in Huntsville unless otherwise directed by customers. If the Laboratory is sold, either the new owner will accept record ownership or the records will go into Company storage as stated above.

16.0 ASSESSMENTS

16.1 General

Assessments consist of internal audits and management reviews as set forth in Procedure 1013.

16.2 Audits

Internal audits are planned, performed at least annually on all areas of the quality system, and are performed by qualified people who are as independent as possible from the activity audited. (The Laboratory's small size inhibits full independence in some technical areas.) Audits are coordinated by the Quality Manager who assures audit plans and checklists are generated and the results documented. Reports include descriptions of any findings and provide the auditor's assessment of the effectiveness of the audited activity. Report data includes personnel contacted.

Audit findings are reviewed with management and corrective actions agreed to and scheduled. Follow up is performed by QA to verify accomplishment and effectiveness of the corrective action.

16.3 Management Reviews

The Annual Quality Assurance Report, prepared for some clients, is the Management Review vehicle. These reports cover audit results, corrective and preventive actions, external assessments, and QC and inter-laboratory performance checks. The report is reviewed with Management by the QA Manager for the continued suitability of the Quality Program and its effectiveness. Any needed improvements are defined, documented, and implemented. Follow ups are made to verify implementation and effectiveness.

APPENDIX D

LABORATORY ANALYTICAL REPORTS



2508 Quality Lane
Knoxville, TN 37931
865-690-6819 (Phone)

Work Order #: L28833 R2

Exelon

July 18, 2006



Kathy Shaw
Conestoga-Rovers & Associates
45 Farmington Valley Road
Plainville CT 06062

**Case Narrative - L28833
EX001-3ESPZION-06**

07/18/2006 16:27

Sample Receipt

The following samples were received on June 2, 2006 in good condition, unless otherwise noted.

Revision 1:

Includes the rerun strontium results for L28833-19. The ID was also corrected.

Revision 2:

Includes the recount for Total Strontium of sample WS-ZION-LAKE-052606-MS-015 (L28833-19). This sample was recounted to meet the client required MDC of 2.0 pCi/L.

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)
WG-ZION-MW-4U-052406-MB-002	L28833-1	
WG-ZION-MW-4L-052406-MB-004	L28833-2	
WG-ZION-MW-7L-052506-MS-007	L28833-3	
WG-ZION-MW-6L-052506-MS-009	L28833-4	
WG-ZION-MW-8U-052406-MS-003	L28833-5	
WG-ZION-MW-8L-052406-MS-001	L28833-6	
WG-ZION-MW-7U-052406-MS-005	L28833-7	
WG-ZN-MW-ZN-03U-052506-DS-01	L28833-8	
WG-ZN-MW-ZN-03U-052506-DS-02	L28833-9	
WG-ZN-MW-ZN-03L-052506-DS-03	L28833-10	
WG-ZN-MW-ZN-02U-052606-DS-04	L28833-11	
WG-ZN-MW-ZN-02L-052606-DS-06	L28833-12	
WG-ZN-MW-ZN-01U-052606-DS-05	L28833-13	
WG-ZN-MW-ZN-01L-052606-DS-07	L28833-14	
WG-ZN-MW-ZN-09-052606-DS-08	L28833-15	
WG-ZN-MW-ZN-09-052606-DS-09	L28833-16	
WG-ZION-MW-6U-052606-MS-011	L28833-17	
WG-ZION-MW-5L-052606-MS-013	L28833-18	
WS-ZION-LAKE-052606-MS-015	L28833-19	
WG-ZION-MW-5U-052606-MS-017	L28833-20	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3	TBE-2010	EPA 906.0
TOTAL SR	TBE-2018	EPA 905.0



Case Narrative - L28833
EX001-3ESPZION-06

07/18/2006 16:27

Gamma Spectroscopy

Quality Control

Quality control samples were analyzed as WG4095, WG4096.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-DN-DSP-121-052606-JH-014	L28821-1	WG4095-3
WG-ZN-MW-ZN-01U-052606-DS-05	L28833-13	WG4096-3

H-3

Quality Control

Quality control samples were analyzed as WG4107.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-ZION-MW-4U-052406-MB-002	L28833-1	WG4107-3



**Case Narrative - L28833
EX001-3ESPZION-06**

07/18/2006 16:27

TOTAL SR
Quality Control

Quality control samples were analyzed as WG4121.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

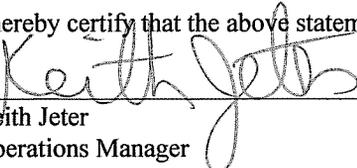
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-ZION-MW-4U-052406-MB-002	L28833-1	WG4121-3

Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Sample Receipt Summary

L 20000

CONESTOGA-ROVERS & ASSOCIATES
 8615 W. Bryn Mawr Avenue
 Chicago, Illinois 60631
 (773)380-9933 phone
 (773)380-6421 fax



SHIPPED TO
 (Laboratory Name): **Teledyne Brown**

REFERENCE NUMBER:
45136-30

PROJECT NAME:
Zion Generating Station

CHAIN-OF-CUSTODY RECORD

SAMPLER'S SIGNATURE: *Marcia Sivik* PRINTED NAME: **Marcia Sivik**

PARAMETERS:
*Trichloroethylene
 Spec. Analysis*

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	REMARKS
1	5/24/06	13:45	MB-002 W6-Zion-MW-4U-052406-MB-002	VL	2	X X +
2	5/24/06	13:45	W6-Zion-MW-4L-052406-MB-004	VL	2	X X
TOTAL NUMBER OF CONTAINERS 4						

RELINQUISHED BY: ① <i>Marcia Sivik</i>	DATE: 5/24/06 TIME: 11:55	RECEIVED BY: ② <i>Ruboye</i>	DATE: 5-31-06 TIME: 11:55
RELINQUISHED BY: ②	DATE: _____ TIME: _____	RECEIVED BY: ③	DATE: _____ TIME: _____
RELINQUISHED BY: ③	DATE: _____ TIME: _____	RECEIVED BY: ④	DATE: _____ TIME: _____

AIR BILL No.

METHOD OF SHIPMENT:
 White - Fully Executed Copy
 Yellow - Receiving Laboratory Copy
 Pink - Shipper Copy
 Goldenrod - Sampler Copy

RECEIVED FOR LABORATORY BY:
B. Wilherson
 DATE: 6-2-06 TIME: 11:00 AM

Teledyne Brown Engineering
Sample Receipt Verification/Variance Report

06/05/06 13:15

SR #: SR08705

Client: Exelon

Project #: EX001-3ESPZION-06

LIMS #: L28833

Initiated By: BWILKERSON

Init Date: 06/05/06 Receive Date: 06/05/06

Notification of Variance

Person Notified:

Contacted By:

Notify Date:

Notify Method:

Notify Comment:

Client Response

Person Responding:

Response Date:

Response Method:

Response Comment

Criteria	Yes	No	NA	Comment
1 Shipping container custody seals present and intact.			NA	
2 Sample container custody seals present and intact.			NA	
3 Sample containers received in good condition	Y			
4 Chain of custody received with samples	Y			
5 All samples listed on chain of custody received	Y			
6 Sample container labels present and legible.	Y			
7 Information on container labels correspond with chain of custody	Y			
8 Sample(s) properly preserved and in appropriate container(s)	Y			Ph at or below 2
9 Other (Describe)			NA	

Internal Chain of Custody

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Teledyne Brown Engineering
Internal Chain of Custody
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L28833-1 **WG** **WG-ZION-MW-4U-052406-MB-002**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/08/06
Count Room	H-3	KPW	06/08/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-2 **WG** **WG-ZION-MW-4L-052406-MB-004**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/08/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-3 **WG** **WG-ZION-MW-7L-052506-MS-007**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-4 **WG** **WG-ZION-MW-6L-052506-MS-009**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-5 **WG** **WG-ZION-MW-8U-052406-MS-003**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06

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Teledyne Brown Engineering
Internal Chain of Custody
Supplemental Sheet

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L28833-5	WG	WG-ZION-MW-8U-052406-MS-003		
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-6	WG	WG-ZION-MW-8L-052406-MS-001		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-7	WG	WG-ZION-MW-7U-052406-MS-005		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-8	WG	WG-ZN-MW-ZN-03U-052506-DS-01		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-9	WG	WG-ZN-MW-ZN-03U-052506-DS-02		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-10	WG	WG-ZN-MW-ZN-03L-052506-DS-03		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06

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Teledyne Brown Engineering
Internal Chain of Custody
Supplemental Sheet

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L28833-10	WG	WG-ZN-MW-ZN-03L-052506-DS-03		
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-11	WG	WG-ZN-MW-ZN-02U-052606-DS-04		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-12	WG	WG-ZN-MW-ZN-02L-052606-DS-06		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-13	WG	WG-ZN-MW-ZN-01U-052606-DS-05		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			BWILKERSON	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

L28833-14	WG	WG-ZN-MW-ZN-01L-052606-DS-07		
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	GELI		EJ	06/08/06
Aliquot	H-3		SO	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/09/06
Count Room	SR-90 (FAST)		KPW	06/10/06

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Supplemental Sheet

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L28833-15 **WG** **WG-ZN-MW-ZN-09-052606-DS-08**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-16 **WG** **WG-ZN-MW-ZN-09-052606-DS-09**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-17 **WG** **WG-ZION-MW-6U-052606-MS-011**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-18 **WG** **WG-ZION-MW-5L-052606-MS-013**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		BWILKERSON	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/09/06
Count Room	SR-90 (FAST)	KPW	06/10/06

L28833-19 **WG** **WS-ZION-LAKE-052606-MS-015**

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/02/06
Aliquot	GELI	EJ	06/08/06
Aliquot	H-3	SO	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06

Analytical Results Summary

Report of Analysis
 07/18/06 11:52

L28833

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZION-MW-4U-052406-MB-002** Matrix: Ground Water (WG)
 Station: Collect Start: 05/24/2006 00:00
 Description: Collect Stop: Volume:
 LIMS Number: L28833-1 Receive Date: 06/02/2006 % Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-3.91E+01	1.04E+02	1.76E+02	pCi/L		10	ml		06/08/06	60	M	U
TOTAL SR	2018	5.15E-01	7.41E-01	1.39E+00	pCi/L		450	ml	05/24/06 00:00	06/10/06	150	M	U
MN-54	2007	1.15E+00	2.23E+00	3.76E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
CO-58	2007	-8.73E-01	2.30E+00	3.74E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
FE-59	2007	-4.37E-01	4.83E+00	7.98E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
CO-60	2007	6.79E-01	2.13E+00	3.56E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
ZN-65	2007	1.23E-01	4.59E+00	7.62E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
NB-95	2007	9.94E-01	2.41E+00	4.07E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
ZR-95	2007	-3.72E+00	4.24E+00	6.78E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
CS-134	2007	5.59E+00	4.71E+00	3.84E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
CS-137	2007	-4.71E-01	2.30E+00	3.73E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
BA-140	2007	6.99E+00	1.72E+01	2.88E+01	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U
LA-140	2007	2.08E+00	5.62E+00	9.50E+00	pCi/L		3239.8	ml	05/24/06 00:00	06/08/06	34625	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma, peak identified (gamma only)
 U* = Compound/Analyte not detected, Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery
Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Report of Analysis

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L28833

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	2.93E+01	1.05E+02	1.70E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	5.54E-01	5.03E-01	9.20E-01	pCi/L		450	ml	05/24/06 13:45	06/10/06	150	M	U
K-40	2007	8.59E+01	4.42E+01	3.27E+01	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	+
MN-54	2007	-1.16E+00	2.19E+00	3.51E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
CO-58	2007	-1.96E+00	2.29E+00	3.61E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
FE-59	2007	2.74E+00	4.75E+00	8.08E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
CO-60	2007	8.46E-02	2.28E+00	3.74E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
ZN-65	2007	6.17E+00	4.52E+00	7.96E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
NB-95	2007	5.11E-01	2.34E+00	3.87E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
ZR-95	2007	1.27E-01	4.15E+00	6.83E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
CS-134	2007	4.36E+00	3.99E+00	3.80E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
CS-137	2007	-1.55E-01	2.18E+00	3.60E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
BA-140	2007	3.53E+00	1.65E+01	2.70E+01	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U
LA-140	2007	2.06E+00	5.50E+00	9.33E+00	pCi/L		3310.82	ml	05/24/06 13:45	06/08/06	34628	Sec	U

Sample ID: **WG-ZION-MW-4L-052406-MB-004** Matrix: Ground Water (WG)

Station: Volume:

Description: % Moisture:

LIMS Number: L28833-2

Collect Start: 05/24/2006 13:45

Collect Stop:

Receive Date: 06/02/2006

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis

07/18/06 11:52

L28833

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-2.27E+01	1.00E+02	1.68E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	4.12E-01	6.46E-01	1.22E+00	pCi/L		450	ml	05/25/06 09:15	06/10/06	150	M	U
MN-54	2007	3.41E-01	2.84E+00	4.68E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
CO-58	2007	7.18E-02	3.39E+00	5.54E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
FE-59	2007	2.78E+00	6.90E+00	1.16E+01	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
CO-60	2007	-1.53E-01	3.31E+00	5.64E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
ZN-65	2007	9.12E+00	7.95E+00	1.22E+01	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
NB-95	2007	2.82E+00	3.27E+00	5.64E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
ZR-95	2007	1.25E+00	5.64E+00	9.40E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
CS-134	2007	1.03E+01	4.84E+00	6.29E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U*
CS-137	2007	1.25E+00	2.93E+00	4.99E+00	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
BA-140	2007	-5.88E+00	2.12E+01	3.42E+01	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U
LA-140	2007	-5.79E-01	7.18E+00	1.18E+01	pCi/L		3096.32	ml	05/25/06 09:15	06/09/06	14466	Sec	U

Sample ID: **WG-ZION-MW-7L-052506-MS-007** Matrix: Ground Water (WG)

Station: Collect Start: 05/25/2006 09:15 Volume:

Description: Collect Stop: Receive Date: 06/02/2006 % Moisture:

LIMS Number: L28833-3

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery
Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis
07/18/06 11:52
L28833

Conestoga-Rovers & Associates
EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	2.41E+01	1.09E+02	1.78E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	1.25E+00	8.11E-01	1.42E+00	pCi/L		450	ml	05/24/06 11:35	06/10/06	150	M	U
K-40	2007	6.94E+01	4.57E+01	4.68E+01	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	+
MN-54	2007	1.35E+00	2.89E+00	4.88E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
CO-58	2007	6.14E-01	3.51E+00	5.18E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
FE-59	2007	-4.98E+00	7.42E+00	1.17E+01	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
CO-60	2007	5.01E-01	2.95E+00	4.91E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
ZN-65	2007	5.49E+00	8.37E+00	1.24E+01	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
NB-95	2007	4.21E+00	3.45E+00	6.07E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
ZR-95	2007	-4.02E+00	6.06E+00	9.56E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
CS-134	2007	4.44E+00	7.23E+00	5.76E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
CS-137	2007	3.52E+00	3.19E+00	5.59E+00	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
BA-140	2007	5.57E+00	2.54E+01	4.18E+01	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U
LA-140	2007	4.91E-01	7.97E+00	1.33E+01	pCi/L		3209.5	ml	05/24/06 11:35	06/09/06	14641	Sec	U

Matrix: Ground Water (WG)

Volume:

% Moisture:

Collect Start: 05/24/2006 11:35

Collect Stop:

Receive Date: 06/02/2006

Sample ID: WG-ZION-MW-8U-052406-MS-003

Station:

Description:

LIMS Number: L28833-5

Flag Values
U = Compound/Analyte not detected or less than 3 sigma
+ = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
High = Activity concentration exceeds customer reporting value
Spec = MDC exceeds customer technical specification
L = Low recovery
H = High recovery

No = Peak not identified in gamma spectrum
Yes = Peak identified in gamma spectrum
**** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis

07/18/06 11:52

L28833

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	1.46E+02	1.12E+02	1.70E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	1.55E+00	7.03E-01	1.16E+00	pCi/L		450	ml	05/24/06 10:14	06/10/06	150	M	+
MN-54	2007	7.64E-02	2.89E+00	4.80E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
CO-58	2007	1.49E-02	3.36E+00	5.47E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
FE-59	2007	6.33E-01	6.66E+00	1.11E+01	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
CO-60	2007	-2.20E+00	2.95E+00	4.54E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
ZN-65	2007	9.40E+00	7.78E+00	1.19E+01	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
NB-95	2007	1.92E+00	3.51E+00	5.89E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
ZR-95	2007	-4.74E+00	6.12E+00	9.61E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
CS-134	2007	1.55E+01	6.88E+00	6.39E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
CS-137	2007	-1.69E-01	3.19E+00	5.10E+00	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U*
BA-140	2007	2.71E+00	2.35E+01	3.86E+01	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U
LA-140	2007	-6.01E+00	7.84E+00	1.21E+01	pCi/L		3083.2	ml	05/24/06 10:14	06/09/06	14771	Sec	U

Sample ID: **WG-ZION-MW-8L-052406-MS-001** Matrix: Ground Water (WG)

Station: Volume:

Description: % Moisture:

LIMS Number: L28833-6

Collect Start: 05/24/2006 10:14

Collect Stop:

Receive Date: 06/02/2006

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis
07/18/06 11:52
L28833

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EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	1.05E+01	1.04E+02	1.71E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	1.27E+00	5.63E-01	9.35E-01	pCi/L		450	ml	05/24/06 14:35	06/10/06	150	M	+
MN-54	2007	-6.66E-01	3.12E+00	5.03E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
CO-58	2007	-2.13E+00	3.33E+00	5.24E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
FE-59	2007	-3.75E-01	6.84E+00	1.12E+01	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
CO-60	2007	-3.73E-01	3.12E+00	5.09E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
ZN-65	2007	1.42E+01	7.41E+00	1.20E+01	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U*
NB-95	2007	2.89E+00	3.59E+00	6.12E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
ZR-95	2007	-5.33E+00	6.28E+00	9.87E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
CS-134	2007	1.78E+01	6.30E+00	6.41E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U*
CS-137	2007	9.02E-01	3.26E+00	5.47E+00	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
BA-140	2007	-4.53E+00	2.49E+01	4.05E+01	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U
LA-140	2007	-6.30E+00	7.87E+00	1.22E+01	pCi/L		3260.8	ml	05/24/06 14:35	06/09/06	17561	Sec	U

Sample ID: WG-ZION-MW-7U-052406-MS-005
Station:
Description:
LIMS Number: L28833-7

Collect Start: 05/24/2006 14:35
Collect Stop:
Receive Date: 06/02/2006

Matrix: Ground Water
Volume:
% Moisture:

(WG)

Flag Values
U = Compound/Analyte not detected or less than 3 sigma
+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
High = Activity concentration exceeds customer reporting value
Spec = MDC exceeds customer technical specification
L = Low recovery
H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
Yes = Peak identified in gamma spectrum
**** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis
 07/18/06 11:52

L28833

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EX001-3ESPZION-06

Kathy Shaw

Sample ID: WG-ZN-MW-ZN-03U-052506-DS-01		Matrix: Ground Water		(WG)									
Station:		Volume:											
Description:		% Moisture:											
LIMS Number: L28833-8		Collect Start: 05/25/2006 10:58											
		Collect Stop:											
		Receive Date: 06/02/2006											
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	1.13E+02	1.13E+02	1.74E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	5.17E-01	6.55E-01	1.23E+00	pCi/L		450	ml	05/25/06 10:58	06/10/06	150	M	U
MN-54	2007	-5.33E-01	2.29E+00	3.71E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
CO-58	2007	-3.71E+00	2.50E+00	3.67E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
FE-59	2007	8.70E+00	5.63E+00	1.04E+01	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
CO-60	2007	-4.71E-02	2.34E+00	3.80E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
ZN-65	2007	6.96E+00	5.64E+00	1.01E+01	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
NB-95	2007	-8.82E-01	2.63E+00	4.27E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
ZR-95	2007	-1.09E+00	4.67E+00	7.62E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
CS-134	2007	4.16E+00	3.91E+00	4.41E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
CS-137	2007	1.36E+00	2.57E+00	4.32E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
BA-140	2007	-9.99E-01	1.65E+01	2.71E+01	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U
LA-140	2007	-2.85E+00	5.65E+00	8.74E+00	pCi/L		3044.14	ml	05/25/06 10:58	06/09/06	15001	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

Bolded text indicates reportable value.

Report of Analysis
 07/18/06 11:52

L28833

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EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZN-MW-ZN-03U-052506-DS-02** Matrix: Ground Water (WG)
 Station: Volume:
 Description: % Moisture:
 LIMS Number: L28833-9 Collect Start: 05/25/2006 11:15 Collect Stop: Receive Date: 06/02/2006

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	1.13E+02	1.08E+02	1.66E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	8.04E-01	6.40E-01	1.15E+00	pCi/L		450	ml	05/25/06 11:15	06/10/06	150	M	U
MN-54	2007	-8.66E-01	2.93E+00	4.94E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
CO-58	2007	-2.10E+00	3.03E+00	5.00E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
FE-59	2007	1.60E+00	6.10E+00	1.09E+01	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
CO-60	2007	3.16E+00	2.86E+00	5.38E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
ZN-65	2007	1.80E+01	7.34E+00	1.30E+01	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U*
NB-95	2007	5.30E+00	3.26E+00	6.06E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
ZR-95	2007	-3.82E+00	5.40E+00	8.95E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
CS-134	2007	2.05E+01	4.31E+00	7.59E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
CS-137	2007	4.48E+00	3.07E+00	5.65E+00	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U*
BA-140	2007	-1.42E+01	2.22E+01	3.64E+01	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U
LA-140	2007	4.24E+00	6.04E+00	1.15E+01	pCi/L		3006.76	ml	05/25/06 11:15	06/09/06	15126	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis

07/18/06 11:52

L28833

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EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	1.42E+02	1.07E+02	1.62E+02	pCi/L		10	ml	05/25/06 14:22	06/09/06	60	M	U
TOTAL SR	2018	1.06E+00	6.80E-01	1.19E+00	pCi/L		450	ml	05/25/06 14:22	06/10/06	150	M	U
MIN-54	2007	-2.09E+00	2.95E+00	4.54E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
CO-58	2007	-2.84E+00	3.48E+00	5.35E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
FE-59	2007	8.16E+00	7.48E+00	1.33E+01	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
CO-60	2007	-3.92E-01	3.34E+00	5.33E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
ZN-65	2007	1.39E+00	6.68E+00	1.11E+01	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
NB-95	2007	5.28E+00	3.64E+00	6.52E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
ZR-95	2007	-1.88E+00	6.16E+00	9.91E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
CS-134	2007	-3.24E+00	4.37E+00	5.64E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
CS-137	2007	3.15E+00	3.33E+00	5.83E+00	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
BA-140	2007	-1.03E+00	2.34E+01	3.82E+01	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U
LA-140	2007	1.27E+00	7.63E+00	1.29E+01	pCi/L		3027.97	ml	05/25/06 14:22	06/09/06	12460	Sec	U

Sample ID: WG-ZN-MW-ZN-03L-052506-DS-03

Station: Matrix: Ground Water (WG)

Description: Volume:

LIMS Number: L28833-10 % Moisture:

Collect Start: 05/25/2006 14:22

Collect Stop:

Receive Date: 06/02/2006

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

Flag Values
 No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis

07/18/06 11:52
L28833

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EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-1.25E+01	1.01E+02	1.68E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	6.77E-01	6.50E-01	1.18E+00	pCi/L		450	ml	05/26/06 09:53	06/10/06	150	M	U
K-40	2007	7.37E+01	4.45E+01	4.75E+01	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	+
MIN-54	2007	-6.90E-01	2.79E+00	4.54E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
CO-58	2007	-6.45E-01	3.21E+00	5.25E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
FE-59	2007	-1.72E+00	6.37E+00	1.03E+01	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
CO-60	2007	-2.86E+00	2.76E+00	4.06E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
ZN-65	2007	3.24E-01	6.00E+00	9.97E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
NB-95	2007	7.28E-01	3.07E+00	5.18E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
ZR-95	2007	-1.33E+00	5.71E+00	9.13E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
CS-134	2007	-1.13E-01	3.67E+00	5.09E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
CS-137	2007	6.15E-01	2.95E+00	4.89E+00	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
BA-140	2007	-5.11E-01	1.99E+01	3.29E+01	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U
LA-140	2007	-3.32E+00	6.68E+00	1.05E+01	pCi/L		3001.26	ml	05/26/06 09:53	06/09/06	11970	Sec	U

Matrix: Ground Water
Volume:
% Moisture:

Collect Start: 05/26/2006 09:53
Collect Stop:
Receive Date: 06/02/2006

Sample ID: WG-ZN-MW-ZN-02U-052606-DS-04
Station:
Description:
LIMS Number: L28833-11

Flag Values
U = Compound/Analyte not detected or less than 3 sigma
+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
High = Activity concentration exceeds customer reporting value
Spec = MDC exceeds customer technical specification
L = Low recovery
H = High recovery

Flag Values
No = Peak not identified in gamma spectrum
Yes = Peak identified in gamma spectrum
**** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis
 07/18/06 11:52

L28833

Conestoga-Rovers & Associates
 EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
Sample ID: WG-ZN-MW-ZN-02L-052606-DS-06 Matrix: Ground Water (WG) Station: Collect Start: 05/26/2006 12:30 Description: Collect Stop: Volume: LIMS Number: L28833-12 Receive Date: 06/02/2006 % Moisture:													
H-3	2010	-1.15E+02	9.68E+01	1.73E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	7.27E-01	6.81E-01	1.24E+00	pCi/L		450	ml	05/26/06 12:30	06/10/06	150	M	U
K-40	2007	8.10E+01	4.25E+01	4.82E+01	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	+
MN-54	2007	-9.45E-01	2.85E+00	4.55E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
CO-58	2007	-1.53E+00	3.35E+00	5.34E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
FE-59	2007	6.49E-01	6.47E+00	1.08E+01	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
CO-60	2007	-1.72E-01	2.86E+00	4.66E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
ZN-65	2007	6.91E+00	6.46E+00	1.15E+01	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
NB-95	2007	3.09E+00	3.17E+00	5.52E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
ZR-95	2007	-1.70E+00	5.88E+00	9.50E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
CS-134	2007	2.88E+00	6.97E+00	5.38E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
CS-137	2007	5.95E-01	3.19E+00	5.33E+00	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
BA-140	2007	3.12E+00	2.16E+01	3.54E+01	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U
LA-140	2007	-5.60E+00	7.46E+00	1.15E+01	pCi/L		3057.05	ml	05/26/06 12:30	06/09/06	15481	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

Bolded text indicates reportable value.
 No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted
 MDC - Minimum Detectable Concentration

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EX001-3ESPZION-06



Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	2.61E+02	1.24E+02	1.77E+02	pCi/L		10	ml	05/26/06 11:02	06/09/06	60	M	+
TOTAL SR	2018	6.78E-01	6.79E-01	1.25E+00	pCi/L		450	ml	05/26/06 11:02	06/10/06	150	M	U
MN-54	2007	-8.72E-02	3.42E+00	5.67E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
CO-58	2007	-1.35E+00	3.37E+00	5.33E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
FE-59	2007	4.25E+00	7.57E+00	1.31E+01	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
CO-60	2007	3.65E+00	3.57E+00	6.32E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
ZN-65	2007	2.54E+00	7.23E+00	1.23E+01	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
NB-95	2007	3.52E+00	3.44E+00	5.98E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
ZR-95	2007	-4.17E+00	6.28E+00	9.84E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
CS-134	2007	3.58E+00	6.16E+00	6.16E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
CS-137	2007	7.41E-01	3.64E+00	5.95E+00	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
BA-140	2007	1.05E+01	2.29E+01	3.84E+01	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U
LA-140	2007	-2.50E+00	7.73E+00	1.23E+01	pCi/L		3002.48	ml	05/26/06 11:02	06/09/06	11483	Sec	U

Sample ID: **WG-ZN-MW-ZN-01U-052606-DS-05** Matrix: Ground Water (WG)

Station: Collect Start: 05/26/2006 11:02

Collect Stop: 06/02/2006

Description: Volume: % Moisture:

LIMS Number: L28833-13

Receive Date: 06/02/2006

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Kathy Shaw

Sample ID: WG-ZN-MW-ZN-01L-052606-DS-07										Matrix: Ground Water			(WG)	
Station: Collect Start: 05/26/2006 13:40										Volume:				
Description: Receive Date: 06/02/2006										% Moisture:				
LIMS Number: L28833-14														
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values	
H-3	2010	5.86E+02	1.41E+02	1.76E+02	pCi/L		10	ml		06/09/06	60	M	+	
TOTAL SR	2018	1.03E+00	7.27E-01	1.28E+00	pCi/L		450	ml	05/26/06 13:40	06/10/06	150	M	U	
K-40	2007	5.30E+01	3.42E+01	3.75E+01	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	+	
MN-54	2007	1.38E+00	2.50E+00	4.26E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
CO-58	2007	-2.57E+00	2.84E+00	4.46E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
FE-59	2007	8.62E+00	5.77E+00	1.04E+01	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
CO-60	2007	1.86E+00	2.44E+00	4.23E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
ZN-65	2007	6.08E+00	5.58E+00	9.85E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
NB-95	2007	1.54E+00	2.72E+00	4.65E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
ZR-95	2007	-1.90E+00	4.93E+00	7.81E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
CS-134	2007	7.77E+00	5.91E+00	5.13E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
CS-137	2007	1.85E+00	2.60E+00	4.42E+00	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
BA-140	2007	-7.65E+00	1.76E+01	2.86E+01	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
LA-140	2007	5.00E+00	5.74E+00	1.01E+01	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	U	
AC-228	2007	3.52E+01	1.03E+01	1.45E+01	pCi/L		3024.01	ml	05/26/06 13:40	06/09/06	14400	Sec	+	

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-2.95E+01	7.87E+01	1.33E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	1.08E+00	8.82E-01	1.58E+00	pCi/L		450	ml	05/26/06 14:48	06/10/06	150	M	U
MN-54	2007	7.46E-01	2.35E+00	3.95E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
CO-58	2007	-2.43E+00	2.65E+00	4.09E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
FE-59	2007	-7.20E-01	5.38E+00	8.80E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
CO-60	2007	1.06E+00	2.25E+00	3.86E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
ZN-65	2007	-3.15E+00	6.67E+00	8.76E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
NB-95	2007	5.26E-01	2.60E+00	4.36E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
ZR-95	2007	-4.54E+00	4.58E+00	7.08E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
CS-134	2007	3.02E+00	3.37E+00	4.28E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
CS-137	2007	1.45E+00	2.54E+00	4.28E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
BA-140	2007	8.09E+00	1.61E+01	2.73E+01	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U
LA-140	2007	-2.86E+00	5.64E+00	8.73E+00	pCi/L		3045.16	ml	05/26/06 14:48	06/09/06	14592	Sec	U

Sample ID: **WG-ZN-MW-ZN-09-052606-DS-08** Matrix: Ground Water (WG)

Station: Collect Start: 05/26/2006 14:48

Description: Collect Stop: Volume:

LIMS Number: L28833-15 Receive Date: 06/02/2006 % Moisture:

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis

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EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZN-MW-ZN-09-052606-DS-09** Matrix: Ground Water (WG)
 Station: Collect Start: 05/26/2006 15:10
 Description: Collect Stop: Volume:
 LIMS Number: L28833-16 Receive Date: 06/02/2006 % Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-1.09E+01	1.07E+02	1.77E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	5.19E-01	8.23E-01	1.55E+00	pCi/L		450	ml	05/26/06 15:10	06/10/06	150	M	U
MIN-54	2007	1.12E+00	2.71E+00	4.81E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
CO-58	2007	-2.66E+00	3.07E+00	5.02E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
FE-59	2007	4.01E-02	5.86E+00	1.03E+01	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
CO-60	2007	-3.91E-01	2.54E+00	4.44E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
ZN-65	2007	1.16E+00	5.79E+00	1.03E+01	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
NB-95	2007	1.94E-01	3.09E+00	5.37E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
ZR-95	2007	1.74E+00	5.63E+00	9.91E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
CS-134	2007	-3.59E-01	3.09E+00	5.31E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
CS-137	2007	-5.27E-01	2.92E+00	5.02E+00	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
BA-140	2007	4.36E+00	2.00E+01	3.43E+01	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U
LA-140	2007	1.47E+00	6.02E+00	1.11E+01	pCi/L		3037.16	ml	05/26/06 15:10	06/09/06	13307	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery
Flag Values
 No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted
 MDC - Minimum Detectable Concentration



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EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-2.36E+01	1.04E+02	1.74E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	9.89E-01	6.85E-01	1.21E+00	pCi/L		450	ml	05/26/06 08:45	06/10/06	150	M	U
MN-54	2007	5.91E-01	3.17E+00	5.22E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
CO-58	2007	2.60E+00	3.34E+00	5.71E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
FE-59	2007	9.82E-01	7.06E+00	1.17E+01	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
CO-60	2007	-1.49E+00	2.93E+00	4.62E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
ZN-65	2007	-9.87E-01	6.62E+00	1.07E+01	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
NB-95	2007	3.26E+00	3.37E+00	5.82E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
ZR-95	2007	-2.29E+00	6.14E+00	9.87E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
CS-134	2007	-4.89E-01	3.40E+00	5.48E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
CS-137	2007	-1.39E+00	3.28E+00	5.30E+00	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
BA-140	2007	-1.35E+01	2.32E+01	3.68E+01	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U
LA-140	2007	4.81E-01	7.01E+00	1.17E+01	pCi/L		3063.8	ml	05/26/06 08:45	06/09/06	15361	Sec	U

Sample ID: WG-ZION-MW-6U-052606-MS-011

Station: Matrix: Ground Water (WG)

Description: Volume:

LIMS Number: L28833-17 % Moisture:

Collect Start: 05/26/2006 08:45

Collect Stop:

Receive Date: 06/02/2006

Flag Values
U = Compound/Analyte not detected or less than 3 sigma
+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
High = Activity concentration exceeds customer reporting value
Spec = MDC exceeds customer technical specification
L = Low recovery
H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
Yes = Peak identified in gamma spectrum
**** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis
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EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZION-MW-5U-052606-MS-017** Matrix: Ground Water (WG)
 Station: Collect Start: 05/26/2006 16:00
 Description: Collect Stop: Volume:
 LIMS Number: L28833-20 Receive Date: 06/02/2006 % Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3	2010	-1.29E+01	1.05E+02	1.74E+02	pCi/L		10	ml		06/09/06	60	M	U
TOTAL SR	2018	1.93E+00	7.99E-01	1.30E+00	pCi/L		450	ml	05/26/06 16:00	06/10/06	150	M	+
MN-54	2007	1.78E+00	2.52E+00	4.33E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
CO-58	2007	-7.30E-04	2.61E+00	4.33E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
FE-59	2007	1.20E+00	5.53E+00	9.30E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
CO-60	2007	-5.85E-01	2.52E+00	4.04E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
ZN-65	2007	-1.34E+00	5.28E+00	8.58E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
NB-95	2007	1.30E+00	2.77E+00	4.72E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
ZR-95	2007	-4.26E+00	4.81E+00	7.37E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
CS-134	2007	-1.15E+00	2.82E+00	4.57E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
CS-137	2007	-8.16E-01	2.66E+00	4.28E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
BA-140	2007	1.18E+01	1.75E+01	3.01E+01	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U
LA-140	2007	-3.67E+00	6.17E+00	9.63E+00	pCi/L		3004.12	ml	05/26/06 16:00	06/09/06	14433	Sec	U

Flag Values = Compound/Analyte not detected or less than 3 sigma
 U = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 + = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 U* = Activity concentration exceeds customer reporting value
 High = MDC exceeds customer technical specification
 Spec = Low recovery
 L = High recovery
 H = **Flag text indicates reportable value.**

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

QC Results Summary

QC Summary Report for L28833

7/18/2006 4:29:02PM



H-3

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count</u>	<u>Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG4107-1	H-3	WO	06/08/2006	21:15	< 1.710E+00	pCi/Total	U	P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count</u>	<u>Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG4107-2	H-3	WO	06/08/2006	22:19	5.05E+002	4.580E+02	pCi/Total	90.7	70-130	+	P

Spike ID: 3H-041706-1
Spike conc: 5.05E+002
Spike Vol: 1.00E+000

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count</u>	<u>Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG4107-3 L28833-1	H-3	WG	06/08/2006	22:38	< 1.760E+02	< 1.740E+02	pCi/L		<30	**	NE

+ Positive Result
U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
* < 5 times the MDC are not evaluated
** Nuclide not detected
*** Spiking level < 5 times activity
P Pass
F Fail
NE Not evaluated

QC Summary Report for L28833

7/18/2006 4:29:02PM



L28833

H-3

Associated Samples for

WG4107

SAMPLENUM

CLIENTID

L28833-1	WG-ZION-MW-4U-052406-MB-002
L28833-2	WG-ZION-MW-4L-052406-MB-004
L28833-3	WG-ZION-MW-7L-052506-MS-007
L28833-4	WG-ZION-MW-6L-052506-MS-009
L28833-5	WG-ZION-MW-8U-052406-MS-003
L28833-6	WG-ZION-MW-8L-052406-MS-001
L28833-7	WG-ZION-MW-7U-052406-MS-005
L28833-8	WG-ZN-MW-ZN-03U-052506-DS-01
L28833-9	WG-ZN-MW-ZN-03U-052506-DS-02
L28833-10	WG-ZN-MW-ZN-03L-052506-DS-03
L28833-11	WG-ZN-MW-ZN-02U-052606-DS-04
L28833-12	WG-ZN-MW-ZN-02L-052606-DS-06
L28833-13	WG-ZN-MW-ZN-01U-052606-DS-05
L28833-14	WG-ZN-MW-ZN-01L-052606-DS-07
L28833-15	WG-ZN-MW-ZN-09-052606-DS-08
L28833-16	WG-ZN-MW-ZN-09-052606-DS-09
L28833-17	WG-ZION-MW-6U-052606-MS-011
L28833-18	WG-ZION-MW-5L-052606-MS-013
L28833-19	WS-ZION-LAKE-052606-MS-015
L28833-20	WG-ZION-MW-5U-052606-MS-017

+ Positive Result
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 * < 5 times the MDC are not evaluated
 ** Nuclide not detected
 *** Spiking level < 5 times activity
 P Pass
 F Fail
 NE Not evaluated

QC Summary Report

for L28833

7/18/2006 4:29:02PM



TOTAL SR

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>
WG4121-1	TOTAL SR	WO	06/11/2006 14:39	< 6.730E-01	pCi/Total	U P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>
WG4121-2	TOTAL SR	WO	06/10/2006 18:17	5.84E+001	6.570E+01	pCi/Total	112.6	70-130	+ P

Spike ID: 90SR-011905
 Spike conc: 2.34E+002
 Spike Vol: 2.50E-001

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>
WG4121-3 L28833-1	TOTAL SR	WG	06/10/2006 18:17	< 1.390E+00	< 1.230E+00	pCi/L		<30	** NE

+ Positive Result
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 * < 5 times the MDC are not evaluated
 ** Nuclide not detected
 *** Spiking level < 5 times activity
 P Pass
 F Fail
 NE Not evaluated

Raw Data

Work Order: L28833 Customer: Exelon

Nuclide: H-3 Project: EX001-3ESFZION-06

Sample ID	Run #	Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery Date/time	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Factor	Decay & Ingrowth Factor	Analyst
L28833-1	H-3			10 ml			0	08-jun-06 23:42	08-jun-06 23:42	LS7	98	60	1.82	60	.208		SO
WG-ZION-MW-4U-052406-MB-002																	
Activity: -3.91E+01 Error: 1.04E+02 MDC: 1.76E+02 *																	
L28833-2	H-3			10 ml			0	09-jun-06 00:46	09-jun-06 00:46	LS7	118	60	1.82	60	.216		SO
WG-ZION-MW-4L-052406-MB-004																	
Activity: 2.93E+01 Error: 1.05E+02 MDC: 1.7E+02 *																	
L28833-3	H-3			10 ml			0	09-jun-06 01:50	09-jun-06 01:50	LS7	103	60	1.82	60	.219		SO
WG-ZION-MW-7L-052506-MS-007																	
Activity: -2.27E+01 Error: 1E+02 MDC: 1.68E+02 *																	
L28833-4	H-3			10 ml			0	09-jun-06 02:54	09-jun-06 02:54	LS7	131	60	1.82	60	.212		SO
WG-ZION-MW-6L-052506-MS-009																	
Activity: 7.65E+01 Error: 1.1E+02 MDC: 1.73E+02 *																	
L28833-5	H-3			10 ml			0	09-jun-06 03:58	09-jun-06 03:58	LS7	116	60	1.82	60	.206		SO
WG-ZION-MW-8U-052406-MS-003																	
Activity: 2.41E+01 Error: 1.09E+02 MDC: 1.78E+02 *																	
L28833-6	H-3			10 ml			0	09-jun-06 05:01	09-jun-06 05:01	LS7	151	60	1.82	60	.216		SO
WG-ZION-MW-8L-052406-MS-001																	
Activity: 1.46E+02 Error: 1.12E+02 MDC: 1.7E+02 *																	
L28833-7	H-3			10 ml			0	09-jun-06 06:05	09-jun-06 06:05	LS7	112	60	1.82	60	.215		SO
WG-ZION-MW-7U-052406-MS-005																	
Activity: 1.05E+01 Error: 1.04E+02 MDC: 1.71E+02 *																	
L28833-8	H-3			10 ml			0	09-jun-06 07:09	09-jun-06 07:09	LS7	141	60	1.82	60	.211		SO
WG-ZN-MW-ZN-03U-052506-DS-01																	
Activity: 1.13E+02 Error: 1.13E+02 MDC: 1.74E+02 *																	
L28833-9	H-3			10 ml			0	09-jun-06 08:13	09-jun-06 08:13	LS7	142	60	1.82	60	.222		SO
WG-ZN-MW-ZN-03U-052506-DS-02																	
Activity: 1.13E+02 Error: 1.08E+02 MDC: 1.66E+02 *																	
L28833-10	H-3			10 ml			0	09-jun-06 09:17	09-jun-06 09:17	LS7	152	60	1.82	60	.226		SO
WG-ZN-MW-ZN-03L-052506-DS-03																	
Activity: 1.42E+02 Error: 1.07E+02 MDC: 1.62E+02 *																	
L28833-11	H-3			10 ml			0	09-jun-06 10:21	09-jun-06 10:21	LS7	106	60	1.82	60	.218		L28833
WG-ZN-MW-ZN-02U-052606-DS-04																	
Activity: -1.25E+01 Error: 1.01E+02 MDC: 1.68E+02 *																	
L28833-12	H-3			10 ml			0	09-jun-06 11:24	09-jun-06 11:24	LS7	77	60	1.82	60	.212		SO
WG-ZN-MW-ZN-02L-052606-DS-06																	
Activity: -1.15E+02 Error: 9.68E+01 MDC: 1.73E+02 *																	

Sample ID	Run #	Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery Date/time	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Factor	Decay & Ingrowth Factor	Analyst
L28833-13		H-3		10 ml			0		09-jun-06 12:28	LS7	181	60	1.82	60	.207		SO
WG-ZN-MW-ZN-01U-052606-DS-05																	
Activity: 2.61E+02 * Error: 1.24E+02 MDC: 1.77E+02																	
L28833-14		H-3		10 ml			0		09-jun-06 13:31	LS7	271	60	1.82	60	.208		SO
WG-ZN-MW-ZN-01L-052606-DS-07																	
Activity: 5.86E+02 * Error: 1.41E+02 MDC: 1.76E+02																	
L28833-15		H-3		10 ml			0		09-jun-06 14:35	LS7	98	60	1.82	60	.276		SO
WG-ZN-MW-ZN-09-052606-DS-08																	
Activity: -2.95E+01 Error: 7.87E+01 MDC: 1.33E+02 *																	
L28833-16		H-3		10 ml			0		09-jun-06 15:39	LS7	106	60	1.82	60	.207		SO
WG-ZN-MW-ZN-09-052606-DS-09																	
Activity: -1.09E+01 Error: 1.07E+02 MDC: 1.77E+02 *																	
L28833-17		H-3		10 ml			0		09-jun-06 16:42	LS7	103	60	1.82	60	.211		SO
WG-ZION-MW-6U-052606-MS-011																	
Activity: -2.36E+01 Error: 1.04E+02 MDC: 1.74E+02 *																	
L28833-18		H-3		10 ml			0		09-jun-06 17:46	LS7	111	60	1.82	60	.208		SO
WG-ZION-MW-5L-052606-MS-013																	
Activity: 6.5E+00 Error: 1.07E+02 MDC: 1.76E+02 *																	
L28833-19		H-3		10 ml			0		09-jun-06 18:50	LS7	106	60	1.82	60	.211		SO
WS-ZION-LAKE-052606-MS-015																	
Activity: -1.29E+01 Error: 1.05E+02 MDC: 1.74E+02 *																	
L28833-20		H-3		10 ml			0		09-jun-06 19:54	LS7	106	60	1.82	60	.211		SO
WG-ZION-MW-5U-052606-MS-017																	
Activity: -1.29E+01 Error: 1.05E+02 MDC: 1.74E+02 *																	

Work Order: L28833

Customer: Exelon

Page: 3

Nuclide: SR-90 (FAST) Project: EX001-3ESPZION-06

Sample ID	Run Analysis	Reference	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery	Date/time	Count	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff.	Ingrrowth Factor	Decay &	
L28833-1	TOTAL SR	24-may-06 00:00	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	69.35	10-jun-06 17:17	150	X1A	134	150	308	400	.346	.999	LCB	
WG-ZION-MW-4U-052406-MB-002																		
Activity: 5.15E-01	Error: 7.41E-01	MDC: 1.39E+00																
L28833-2	TOTAL SR	24-may-06 13:45	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	111.56	10-jun-06 17:17	150	X1B	160	150	342	400	.343	.999	LCB	
WG-ZION-MW-4L-052406-MB-004																		
Activity: 5.54E-01	Error: 5.03E-01	MDC: 9.2E-01																
L28833-3	TOTAL SR	25-may-06 09:15	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	80.11	10-jun-06 17:17	150	X1D	134	150	312	400	.344	.999	LCB	
WG-ZION-MW-7L-052506-MS-007																		
Activity: 4.12E-01	Error: 6.46E-01	MDC: 1.22E+00																
L28833-4	TOTAL SR	25-may-06 11:23	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	75.81	10-jun-06 17:17	150	X2A	170	150	264	400	.354	.999	LCB	
WG-ZION-MW-6L-052506-MS-009																		
Activity: 1.77E+00	Error: 7.16E-01	MDC: 1.15E+00																
L28833-5	TOTAL SR	24-may-06 11:35	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	66.13	10-jun-06 17:17	150	X2B	151	150	289	400	.345	.999	LCB	
WG-ZION-MW-8U-052406-MS-003																		
Activity: 1.25E+00	Error: 8.11E-01	MDC: 1.42E+00																
L28833-6	TOTAL SR	24-may-06 10:14	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	79.30	10-jun-06 17:17	150	X2C	167	150	277	400	.344	.999	LCB	
WG-ZION-MW-8L-052406-MS-001																		
Activity: 1.55E+00	Error: 7.03E-01	MDC: 1.16E+00																
L28833-7	TOTAL SR	24-may-06 14:35	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	104.03	10-jun-06 17:17	150	X2D	183	150	307	400	.343	.999	LCB	
WG-ZION-MW-7U-052406-MS-005																		
Activity: 1.27E+00	Error: 5.63E-01	MDC: 9.35E-01																
L28833-8	TOTAL SR	25-may-06 10:58	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	88.17	10-jun-06 17:17	150	X3A	159	150	363	400	.335	.999	LCB	
WG-ZN-MW-ZN-03U-052506-DS-01																		
Activity: 5.17E-01	Error: 6.55E-01	MDC: 1.23E+00																
L28833-9	TOTAL SR	25-may-06 11:15	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	86.29	10-jun-06 17:17	150	X3B	156	150	321	400	.343	.999	LCB	
WG-ZN-MW-ZN-03U-052506-DS-02																		
Activity: 8.04E-01	Error: 6.4E-01	MDC: 1.15E+00																
L28833-10	TOTAL SR	25-may-06 14:22	450 ml	10-jun-06 12:00	10-jun-06 17:17	0	79.57	10-jun-06 17:17	150	X3C	154	150	294	400	.345	.999	LCB	
WG-ZN-MW-ZN-03L-052506-DS-03																		
Activity: 1.06E+00	Error: 6.8E-01	MDC: 1.19E+00																
L28833-11	TOTAL SR	26-may-06 09:53	450 ml	10-jun-06 12:00	10-jun-06 17:18	0	75.81	10-jun-06 17:18	150	X4A	134	150	284	400	.358	.999	LCB	
WG-ZN-MW-ZN-02U-052606-DS-04																		
Activity: 6.77E-01	Error: 6.5E-01	MDC: 1.18E+00																
L28833-12	TOTAL SR	26-may-06 12:30	450 ml	10-jun-06 12:00	10-jun-06 17:18	0	75.81	10-jun-06 17:18	150	X4C	141	150	299	400	.35	.999	LCB	
WG-ZN-MW-ZN-02L-052606-DS-06																		
Activity: 7.27E-01	Error: 6.81E-01	MDC: 1.24E+00																

Work Order: L28833

Customer: Exelon

Nuclide: SR-90 (FAST) Project: EX001-3ESPZION-06

Sample ID	Run Analysis	Reference	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery	Count	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Ingrowth Factor	Decay & Factor	Analyst
L28833-13	TOTAL SR	26-may-06 11:02	450 ml	10-jun-06 12:00		0	79.57	10-jun-06 17:18	X4D	156	150	340	400	.353	.999	LCB
WG-ZN-MW-ZN-01U-052606-DS-05																
Activity: 6.78E-01 Error: 6.79E-01 MDC: 1.25E+00 *																
L28833-14	TOTAL SR	26-may-06 13:40	450 ml	10-jun-06 12:00		0	72.85	10-jun-06 18:17	Y1A	143	150	279	400	.341	.999	LCB
WG-ZN-MW-ZN-01L-052606-DS-07																
Activity: 1.03E+00 Error: 7.27E-01 MDC: 1.28E+00 *																
L28833-15	TOTAL SR	26-may-06 14:48	450 ml	10-jun-06 12:00		0	57.26	10-jun-06 18:17	Y1B	137	150	279	400	.351	.999	LCB
WG-ZN-MW-ZN-09-052606-DS-08																
Activity: 1.08E+00 Error: 8.82E-01 MDC: 1.58E+00 *																
L28833-16	TOTAL SR	26-may-06 15:10	450 ml	10-jun-06 12:00		0	61.56	10-jun-06 18:17	Y1C	129	150	300	400	.345	.999	LCB
WG-ZN-MW-ZN-09-052606-DS-09																
Activity: 5.19E-01 Error: 8.23E-01 MDC: 1.55E+00 *																
L28833-17	TOTAL SR	26-may-06 08:45	450 ml	10-jun-06 12:00		0	75.81	10-jun-06 18:17	Y1D	155	150	305	400	.362	.999	LCB
WG-ZION-MW-6U-052606-MS-011																
Activity: 9.89E-01 Error: 6.85E-01 MDC: 1.21E+00 *																
L28833-18	TOTAL SR	26-may-06 13:15	450 ml	10-jun-06 12:00		0	73.92	10-jun-06 18:17	Y2A	147	150	280	400	.349	.999	LCB
WG-ZION-MW-5L-052606-MS-013																
Activity: 1.09E+00 Error: 7.08E-01 MDC: 1.24E+00 *																
L28833-19	TOTAL SR	26-may-06 11:00	450 ml	10-jun-06 12:00		0	47.04	10-jun-06 18:17	Y2B	134	150	315	400	.356	.999	LCB
WS-ZION-LAKE-052606-MS-015																
Activity: 6.33E-01 Error: 1.06E+00 MDC: 2.02E+00 *																
L28833-19	C1 TOTAL SR	26-may-06 11:00	450 ml	10-jun-06 12:00		0	47.04	21-jun-06 19:42	Y1A	154	200	279	400	.341	.998	LCB
WS-ZION-LAKE-052606-MS-015																
Activity: 4.54E-01 Error: 9.36E-01 MDC: 1.72E+00 *																
L28833-20	TOTAL SR	26-may-06 16:00	450 ml	10-jun-06 12:00		0	68.82	10-jun-06 18:17	Y2C	170	150	268	400	.35	.999	LCB
WG-ZION-MW-5U-052606-MS-017																
Activity: 1.93E+00 * Error: 7.99E-01 MDC: 1.3E+00																

Sec. Review: Analyst: LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:07:49.20
 TBE10 12892256 HpGe ***** Aquisition Date/Time: 8-JUN-2006 18:30:30.14

LIMS No., Customer Name, Client ID: WG L28833-1 EXELON ZION

Sample ID : 10L28833-1 Smple Date: 24-MAY-2006 00:00:00.
 Sample Type : WG Geometry : 1035L091004
 Quantity : 3.23980E+00 L BKGFILe : 10BG060306MT
 Start Channel : 80 Energy Tol : 1.00000 Real Time : 0 09:37:11.03
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 09:37:05.47
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	65.58*	731	1590	4.51	130.27	6.12E-01	2.11E-02	12.0	1.42E+01
2	1	92.57*	20	1039	1.47	184.27	1.30E+00	5.67E-04	353.1	2.69E-01
3	1	139.97	248	1041	1.37	279.13	1.68E+00	7.16E-03	24.2	1.05E+00
4	1	185.82*	78	865	1.27	370.86	1.59E+00	2.26E-03	82.6	1.62E+00
5	1	198.61*	176	891	1.55	396.46	1.55E+00	5.09E-03	36.8	2.87E+00
6	1	238.69*	118	918	3.55	476.66	1.40E+00	3.40E-03	60.9	4.71E+00
7	1	352.15*	41	418	1.97	703.68	1.06E+00	1.19E-03	120.4	1.42E+00
8	1	596.12	95	281	1.67	1191.91	7.06E-01	2.75E-03	40.3	1.69E+00
9	1	609.23*	62	234	1.87	1218.16	6.94E-01	1.78E-03	64.3	1.44E+00
10	1	912.38*	38	154	1.03	1824.89	5.06E-01	1.10E-03	85.3	1.42E+01
11	1	1461.08*	45	69	2.04	2923.31	3.56E-01	1.30E-03	64.2	9.17E-01
12	1	1714.17	81	40	9.66	3430.07	3.19E-01	2.35E-03	23.4	2.93E+00

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	45	10.67*	3.559E-01	2.853E+01	2.853E+01	128.45
RA-226	186.21	78	3.28*	1.594E+00	3.601E+01	3.601E+01	165.29
TH-228	238.63	118	44.60*	1.400E+00	4.541E+00	4.614E+00	121.75
	240.98	-----	3.95	1.392E+00	-----	Line Not Found	-----
U-235	143.76	-----	10.50*	1.683E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.659E+00	-----	Line Not Found	-----
	185.71	78	54.00	1.594E+00	2.187E+00	2.187E+00	165.29
	205.31	-----	4.70	1.524E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 10L28833-1

Acquisition date : 8-JUN-2006 18:30:30

Total number of lines in spectrum	12	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	3	25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.853E+01	2.853E+01	3.664E+01	128.45	
RA-226	1600.00Y	1.00	3.601E+01	3.601E+01	5.953E+01	165.29	
TH-228	1.91Y	1.02	4.541E+00	4.614E+00	5.617E+00	121.75	
U-235	7.04E+08Y	1.00	2.187E+00	2.187E+00	3.616E+00	165.29	K
Total Activity :			7.127E+01	7.134E+01			

Grand Total Activity :	7.127E+01	7.134E+01
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Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 10L28833-1

Page : 3
Acquisition date : 8-JUN-2006 18:30:30

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.58	731	1590	4.51	130.27	123	13	2.11E-02	24.0	6.12E-01	
1	92.57	20	1039	1.47	184.27	180	9	5.67E-04	****	1.30E+00	
1	139.97	248	1041	1.37	279.13	275	9	7.16E-03	48.5	1.68E+00	
1	198.61	176	891	1.55	396.46	391	10	5.09E-03	73.5	1.55E+00	
1	352.15	41	418	1.97	703.68	697	13	1.19E-03	****	1.06E+00	
1	596.12	95	281	1.67	1191.91	1184	15	2.75E-03	80.6	7.06E-01	
1	609.23	62	234	1.87	1218.16	1212	14	1.78E-03	****	6.94E-01	
1	912.38	38	154	1.03	1824.89	1815	17	1.10E-03	****	5.06E-01	
1	1714.17	81	40	9.66	3430.07	3418	24	2.35E-03	46.7	3.19E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	12
Number of unidentified lines	9
Number of lines tentatively identified by NID	3 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	2.853E+01	2.853E+01	3.664E+01	128.45			
RA-226	1600.00Y	1.00	3.601E+01	3.601E+01	5.953E+01	165.29			
TH-228	1.91Y	1.02	4.541E+00	4.614E+00	5.617E+00	121.75			
Total Activity :			6.908E+01	6.915E+01					

Grand Total Activity : 6.908E+01 6.915E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.853E+01	3.664E+01	3.090E+01	0.000E+00	0.923
RA-226	3.601E+01	5.953E+01	8.461E+01	0.000E+00	0.426
TH-228	4.614E+00	5.617E+00	6.260E+00	0.000E+00	0.737

---- Non-Identified Nuclides ----

Key-Line

Nuclide	(pCi/L)	Ided	(pCi/L)		
BE-7	1.631E+00	2.152E+01	3.577E+01	0.000E+00	0.046
NA-24	-7.951E+01	5.032E+01	Half-Life	too short	
CR-51	1.079E+00	2.650E+01	4.365E+01	0.000E+00	0.025
MN-54	1.151E+00	2.232E+00	3.760E+00	0.000E+00	0.306
CO-57	1.301E+00	2.229E+00	3.720E+00	0.000E+00	0.350
CO-58	-8.728E-01	2.301E+00	3.740E+00	0.000E+00	-0.233
FE-59	-4.366E-01	4.831E+00	7.981E+00	0.000E+00	-0.055
CO-60	6.794E-01	2.128E+00	3.557E+00	0.000E+00	0.191
ZN-65	1.233E-01	4.590E+00	7.619E+00	0.000E+00	0.016
SE-75	5.496E-01	3.110E+00	5.176E+00	0.000E+00	0.106
SR-85	2.455E+01	2.911E+00	5.717E+00	0.000E+00	4.294
Y-88	4.119E-01	2.431E+00	4.031E+00	0.000E+00	0.102
NB-94	-6.836E-01	2.108E+00	3.385E+00	0.000E+00	-0.202
NB-95	9.936E-01	2.414E+00	4.068E+00	0.000E+00	0.244
ZR-95	-3.724E+00	4.240E+00	6.783E+00	0.000E+00	-0.549
MO-99	-1.461E+02	8.446E+02	1.393E+03	0.000E+00	-0.105
RU-103	2.386E+00	2.891E+00	4.902E+00	0.000E+00	0.487
RU-106	1.479E+01	2.191E+01	3.531E+01	0.000E+00	0.419
AG-110m	4.897E-01	2.137E+00	3.520E+00	0.000E+00	0.139
SN-113	1.837E+00	2.975E+00	4.938E+00	0.000E+00	0.372
SB-124	-2.052E+00	6.108E+00	4.057E+00	0.000E+00	-0.506
SB-125	-3.841E+00	6.421E+00	1.024E+01	0.000E+00	-0.375
TE-129M	-3.139E+01	3.278E+01	5.293E+01	0.000E+00	-0.593
I-131	3.856E+00	8.326E+00	1.380E+01	0.000E+00	0.279
BA-133	3.124E+00	3.409E+00	4.887E+00	0.000E+00	0.639
CS-134	5.586E+00	4.710E+00	3.840E+00	0.000E+00	1.455
CS-136	-2.920E+00	4.557E+00	7.313E+00	0.000E+00	-0.399
CS-137	-4.710E-01	2.301E+00	3.725E+00	0.000E+00	-0.126
CE-139	6.655E-01	2.355E+00	3.877E+00	0.000E+00	0.172
BA-140	6.993E+00	1.722E+01	2.879E+01	0.000E+00	0.243
LA-140	2.081E+00	5.616E+00	9.496E+00	0.000E+00	0.219
CE-141	-1.111E+00	6.038E+00	8.391E+00	0.000E+00	-0.132
CE-144	-6.395E+00	2.027E+01	2.819E+01	0.000E+00	-0.227
EU-152	-9.625E+00	8.175E+00	1.082E+01	0.000E+00	-0.890
EU-154	3.426E+00	4.527E+00	7.575E+00	0.000E+00	0.452
AC-228	-6.355E+00	8.980E+00	1.271E+01	0.000E+00	-0.500
TH-232	-6.321E+00	8.933E+00	1.265E+01	0.000E+00	-0.500
U-235	1.998E+01	1.989E+01	2.846E+01	0.000E+00	0.702
U-238	1.069E+02	2.341E+02	3.907E+02	0.000E+00	0.274
AM-241	-1.088E+01	2.115E+01	2.893E+01	0.000E+00	-0.376

A,10L28833-1	,06/09/2006 04:07,05/24/2006 00:00,	3.240E+00,WG L28833-1 EX
B,10L28833-1	,LIBD	,06/07/2006 09:32,1035L091004
C,K-40	,YES,	2.853E+01, 3.664E+01, 3.090E+01,, 0.923
C,RA-226	,YES,	3.601E+01, 5.953E+01, 8.461E+01,, 0.426
C,TH-228	,YES,	4.614E+00, 5.617E+00, 6.260E+00,, 0.737
C,BE-7	,NO,	1.631E+00, 2.152E+01, 3.577E+01,, 0.046
C,CR-51	,NO,	1.079E+00, 2.650E+01, 4.365E+01,, 0.025
C,MN-54	,NO,	1.151E+00, 2.232E+00, 3.760E+00,, 0.306
C,CO-57	,NO,	1.301E+00, 2.229E+00, 3.720E+00,, 0.350
C,CO-58	,NO,	-8.728E-01, 2.301E+00, 3.740E+00,, -0.233
C,FE-59	,NO,	-4.366E-01, 4.831E+00, 7.981E+00,, -0.055
C,CO-60	,NO,	6.794E-01, 2.128E+00, 3.557E+00,, 0.191
C,ZN-65	,NO,	1.233E-01, 4.590E+00, 7.619E+00,, 0.016
C,SE-75	,NO,	5.496E-01, 3.110E+00, 5.176E+00,, 0.106
C,SR-85	,NO,	2.455E+01, 2.911E+00, 5.717E+00,, 4.294
C,Y-88	,NO,	4.119E-01, 2.431E+00, 4.031E+00,, 0.102
C,NB-94	,NO,	-6.836E-01, 2.108E+00, 3.385E+00,, -0.202
C,NB-95	,NO,	9.936E-01, 2.414E+00, 4.068E+00,, 0.244
C,ZR-95	,NO,	-3.724E+00, 4.240E+00, 6.783E+00,, -0.549
C,MO-99	,NO,	-1.461E+02, 8.446E+02, 1.393E+03,, -0.105
C,RU-103	,NO,	2.386E+00, 2.891E+00, 4.902E+00,, 0.487
C,RU-106	,NO,	1.479E+01, 2.191E+01, 3.531E+01,, 0.419
C,AG-110m	,NO,	4.897E-01, 2.137E+00, 3.520E+00,, 0.139
C,SN-113	,NO,	1.837E+00, 2.975E+00, 4.938E+00,, 0.372
C,SB-124	,NO,	-2.052E+00, 6.108E+00, 4.057E+00,, -0.506
C,SB-125	,NO,	-3.841E+00, 6.421E+00, 1.024E+01,, -0.375
C,TE-129M	,NO,	-3.139E+01, 3.278E+01, 5.293E+01,, -0.593
C,I-131	,NO,	3.856E+00, 8.326E+00, 1.380E+01,, 0.279
C,BA-133	,NO,	3.124E+00, 3.409E+00, 4.887E+00,, 0.639
C,CS-134	,NO,	5.586E+00, 4.710E+00, 3.840E+00,, 1.455
C,CS-136	,NO,	-2.920E+00, 4.557E+00, 7.313E+00,, -0.399
C,CS-137	,NO,	-4.710E-01, 2.301E+00, 3.725E+00,, -0.126
C,CE-139	,NO,	6.655E-01, 2.355E+00, 3.877E+00,, 0.172
C,BA-140	,NO,	6.993E+00, 1.722E+01, 2.879E+01,, 0.243
C,LA-140	,NO,	2.081E+00, 5.616E+00, 9.496E+00,, 0.219
C,CE-141	,NO,	-1.111E+00, 6.038E+00, 8.391E+00,, -0.132
C,CE-144	,NO,	-6.395E+00, 2.027E+01, 2.819E+01,, -0.227
C,EU-152	,NO,	-9.625E+00, 8.175E+00, 1.082E+01,, -0.890
C,EU-154	,NO,	3.426E+00, 4.527E+00, 7.575E+00,, 0.452
C,AC-228	,NO,	-6.355E+00, 8.980E+00, 1.271E+01,, -0.500
C,TH-232	,NO,	-6.321E+00, 8.933E+00, 1.265E+01,, -0.500
C,U-235	,NO,	1.998E+01, 1.989E+01, 2.846E+01,, 0.702
C,U-238	,NO,	1.069E+02, 2.341E+02, 3.907E+02,, 0.274
C,AM-241	,NO,	-1.088E+01, 2.115E+01, 2.893E+01,, -0.376

Sec. Review: Analyst: LIMS: ___

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:08:02.68
 TBE11 P-20610B HpGe ***** Aquisition Date/Time: 8-JUN-2006 18:30:32.65

LIMS No., Customer Name, Client ID: WG L28833-2 EXELON ZION

Sample ID : 11L28833-2 Smple Date: 24-MAY-2006 13:45:00.
 Sample Type : WG Geometry : 1135L090204
 Quantity : 3.31080E+00 L BKGFILE : 11BG060306MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 09:37:20.10
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 09:37:07.77
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	66.16	238	2248	1.25	131.32	5.98E-01	6.87E-03	36.5	
2	0	92.51*	103	1421	1.54	184.19	1.27E+00	2.96E-03	83.8	
3	0	139.76*	207	890	1.31	278.95	1.69E+00	5.97E-03	30.2	
4	0	185.75*	71	907	1.37	371.19	1.62E+00	2.04E-03	93.1	
5	0	198.44	239	900	1.39	396.63	1.57E+00	6.89E-03	24.4	
6	0	238.40*	18	722	1.34	476.75	1.42E+00	5.23E-04	333.3	
7	0	295.60*	95	545	2.66	591.42	1.23E+00	2.74E-03	54.7	
8	0	352.04*	97	424	1.37	704.53	1.08E+00	2.79E-03	50.4	
9	0	582.83*	69	185	0.98	1166.86	7.27E-01	2.01E-03	53.7	
10	0	595.98	135	252	1.77	1193.18	7.14E-01	3.91E-03	25.0	
11	0	609.22*	134	335	1.98	1219.70	7.02E-01	3.88E-03	36.3	
12	0	1460.39*	138	132	1.85	2921.28	3.54E-01	3.97E-03	25.8	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	138	10.67*	3.540E-01	8.589E+01	8.589E+01	51.51
RA-226	186.21	71	3.28*	1.616E+00	3.144E+01	3.144E+01	186.16
TH-228	238.63	18	44.60*	1.422E+00	6.729E-01	6.833E-01	666.54
	240.98	-----	3.95	1.413E+00	-----	Line Not Found	-----
U-235	143.76	-----	10.50*	1.695E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.678E+00	-----	Line Not Found	-----
	185.71	71	54.00	1.616E+00	1.910E+00	1.910E+00	186.16
	205.31	-----	4.70	1.546E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity
 Sample ID : 11L28833-2

Page : 2
 Acquisition date : 8-JUN-2006 18:30:32

Total number of lines in spectrum 12
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 4 33.33%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.589E+01	8.589E+01	4.424E+01	51.51	
RA-226	1600.00Y	1.00	3.144E+01	3.144E+01	5.853E+01	186.16	
TH-228	1.91Y	1.02	6.729E-01	6.833E-01	45.54E-01	666.54	
U-235	7.04E+08Y	1.00	1.910E+00	1.910E+00	3.555E+00	186.16	K
Total Activity :			1.199E+02	1.199E+02			

Grand Total Activity : 1.199E+02 1.199E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 11L28833-2

Page : 3
Acquisition date : 8-JUN-2006 18:30:32

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.16	238	2248	1.25	131.32	128	9	6.87E-03	73.0	5.98E-01	
0	92.51	103	1421	1.54	184.19	178	13	2.96E-03	****	1.27E+00	
0	139.76	207	890	1.31	278.95	275	9	5.97E-03	60.5	1.69E+00	
0	198.44	239	900	1.39	396.63	392	10	6.89E-03	48.8	1.57E+00	
0	295.60	95	545	2.66	591.42	587	11	2.74E-03	****	1.23E+00	
0	352.04	97	424	1.37	704.53	700	10	2.79E-03	****	1.08E+00	
0	582.83	69	185	0.98	1166.86	1162	11	2.01E-03	****	7.27E-01	T
0	595.98	135	252	1.77	1193.18	1187	12	3.91E-03	50.0	7.14E-01	
0	609.22	134	335	1.98	1219.70	1213	18	3.88E-03	72.6	7.02E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	12
Number of unidentified lines	8
Number of lines tentatively identified by NID	4
	33.33%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.589E+01	8.589E+01	4.424E+01	51.51	
RA-226	1600.00Y	1.00	3.144E+01	3.144E+01	5.853E+01	186.16	
TH-228	1.91Y	1.02	6.729E-01	6.833E-01	45.54E-01	666.54	
Total Activity :			1.180E+02	1.180E+02			

Grand Total Activity : 1.180E+02 1.180E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.589E+01	4.424E+01	3.267E+01	0.000E+00	2.629
RA-226	3.144E+01	5.853E+01	8.119E+01	0.000E+00	0.387
TH-228	6.833E-01	4.554E+00	6.099E+00	0.000E+00	0.112

---- Non-Identified Nuclides ----

Key Line

Nuclide	(pCi/L)	Ided	(pCi/L)		
BE-7	1.490E+01	2.090E+01	3.487E+01	0.000E+00	0.427
NA-24	-1.643E+00	2.884E+01	Half-Life	too short	
CR-51	-2.581E+01	2.499E+01	4.033E+01	0.000E+00	-0.640
MN-54	-1.161E+00	2.194E+00	3.513E+00	0.000E+00	-0.330
CO-57	-7.031E-01	2.104E+00	3.450E+00	0.000E+00	-0.204
CO-58	-1.960E+00	2.286E+00	3.606E+00	0.000E+00	-0.544
FE-59	2.742E+00	4.749E+00	8.081E+00	0.000E+00	0.339
CO-60	8.458E-02	2.276E+00	3.740E+00	0.000E+00	0.023
ZN-65	6.174E+00	4.524E+00	7.957E+00	0.000E+00	0.776
SE-75	-2.683E+00	2.913E+00	4.751E+00	0.000E+00	-0.565
SR-85	1.941E+01	2.813E+00	5.331E+00	0.000E+00	3.641
Y-88	-1.159E+00	2.632E+00	4.206E+00	0.000E+00	-0.276
NB-94	-1.548E+00	2.000E+00	3.204E+00	0.000E+00	-0.483
NB-95	5.113E-01	2.336E+00	3.874E+00	0.000E+00	0.132
ZR-95	1.272E-01	4.145E+00	6.827E+00	0.000E+00	0.019
MO-99	4.913E+02	7.378E+02	1.246E+03	0.000E+00	0.394
RU-103	4.086E+00	2.789E+00	4.749E+00	0.000E+00	0.860
RU-106	1.510E+01	2.169E+01	3.371E+01	0.000E+00	0.448
AG-110m	-9.195E-01	2.035E+00	3.309E+00	0.000E+00	-0.278
SN-113	6.063E-01	2.824E+00	4.670E+00	0.000E+00	0.130
SB-124	2.479E+00	5.162E+00	3.943E+00	0.000E+00	0.629
SB-125	-1.396E+00	5.866E+00	9.542E+00	0.000E+00	-0.146
TE-129M	1.519E+01	3.121E+01	5.178E+01	0.000E+00	0.293
I-131	-1.081E+00	7.781E+00	1.277E+01	0.000E+00	-0.085
BA-133	5.095E+00	3.359E+00	4.954E+00	0.000E+00	1.029
CS-134	4.360E+00	3.990E+00	3.800E+00	0.000E+00	1.147
CS-136	-2.461E+00	4.373E+00	6.987E+00	0.000E+00	-0.352
CS-137	-1.545E-01	2.181E+00	3.599E+00	0.000E+00	-0.043
CE-139	8.543E-02	2.167E+00	3.549E+00	0.000E+00	0.024
BA-140	3.534E+00	1.650E+01	2.701E+01	0.000E+00	0.131
LA-140	2.063E+00	5.498E+00	9.329E+00	0.000E+00	0.221
CE-141	2.813E+00	5.585E+00	7.878E+00	0.000E+00	0.357
CE-144	-8.023E+00	1.883E+01	2.601E+01	0.000E+00	-0.308
EU-152	-1.875E+01	8.020E+00	1.022E+01	0.000E+00	-1.835
EU-154	3.134E-01	4.258E+00	7.027E+00	0.000E+00	0.045
AC-228	-1.780E+00	1.032E+01	1.365E+01	0.000E+00	-0.130
TH-232	-1.771E+00	1.026E+01	1.358E+01	0.000E+00	-0.130
U-235	2.904E+01	1.877E+01	2.715E+01	0.000E+00	1.070
U-238	-5.091E+01	2.181E+02	3.586E+02	0.000E+00	-0.142
AM-241	-2.352E+01	3.181E+01	4.302E+01	0.000E+00	-0.547

A,11L28833-2	,06/09/2006	04:08,05/24/2006	13:45,	3.311E+00,WG	L28833-2 EX
B,11L28833-2	,LIBD	,06/07/2006	09:40,	1135L090204	
C,K-40	,YES,	8.589E+01,	4.424E+01,	3.267E+01,,	2.629
C,RA-226	,YES,	3.144E+01,	5.853E+01,	8.119E+01,,	0.387
C,TH-228	,YES,	6.833E-01,	4.554E+00,	6.099E+00,,	0.112
C,BE-7	,NO ,	1.490E+01,	2.090E+01,	3.487E+01,,	0.427
C,CR-51	,NO ,	-2.581E+01,	2.499E+01,	4.033E+01,,	-0.640
C,MN-54	,NO ,	-1.161E+00,	2.194E+00,	3.513E+00,,	-0.330
C,CO-57	,NO ,	-7.031E-01,	2.104E+00,	3.450E+00,,	-0.204
C,CO-58	,NO ,	-1.960E+00,	2.286E+00,	3.606E+00,,	-0.544
C,FE-59	,NO ,	2.742E+00,	4.749E+00,	8.081E+00,,	0.339
C,CO-60	,NO ,	8.458E-02,	2.276E+00,	3.740E+00,,	0.023
C,ZN-65	,NO ,	6.174E+00,	4.524E+00,	7.957E+00,,	0.776
C,SE-75	,NO ,	-2.683E+00,	2.913E+00,	4.751E+00,,	-0.565
C,SR-85	,NO ,	1.941E+01,	2.813E+00,	5.331E+00,,	3.641
C,Y-88	,NO ,	-1.159E+00,	2.632E+00,	4.206E+00,,	-0.276
C,NB-94	,NO ,	-1.548E+00,	2.000E+00,	3.204E+00,,	-0.483
C,NB-95	,NO ,	5.113E-01,	2.336E+00,	3.874E+00,,	0.132
C,ZR-95	,NO ,	1.272E-01,	4.145E+00,	6.827E+00,,	0.019
C,MO-99	,NO ,	4.913E+02,	7.378E+02,	1.246E+03,,	0.394
C,RU-103	,NO ,	4.086E+00,	2.789E+00,	4.749E+00,,	0.860
C,RU-106	,NO ,	1.510E+01,	2.169E+01,	3.371E+01,,	0.448
C,AG-110m	,NO ,	-9.195E-01,	2.035E+00,	3.309E+00,,	-0.278
C,SN-113	,NO ,	6.063E-01,	2.824E+00,	4.670E+00,,	0.130
C,SB-124	,NO ,	2.479E+00,	5.162E+00,	3.943E+00,,	0.629
C,SB-125	,NO ,	-1.396E+00,	5.866E+00,	9.542E+00,,	-0.146
C,TE-129M	,NO ,	1.519E+01,	3.121E+01,	5.178E+01,,	0.293
C,I-131	,NO ,	-1.081E+00,	7.781E+00,	1.277E+01,,	-0.085
C,BA-133	,NO ,	5.095E+00,	3.359E+00,	4.954E+00,,	1.029
C,CS-134	,NO ,	4.360E+00,	3.990E+00,	3.800E+00,,	1.147
C,CS-136	,NO ,	-2.461E+00,	4.373E+00,	6.987E+00,,	-0.352
C,CS-137	,NO ,	-1.545E-01,	2.181E+00,	3.599E+00,,	-0.043
C,CE-139	,NO ,	8.543E-02,	2.167E+00,	3.549E+00,,	0.024
C,BA-140	,NO ,	3.534E+00,	1.650E+01,	2.701E+01,,	0.131
C,LA-140	,NO ,	2.063E+00,	5.498E+00,	9.329E+00,,	0.221
C,CE-141	,NO ,	2.813E+00,	5.585E+00,	7.878E+00,,	0.357
C,CE-144	,NO ,	-8.023E+00,	1.883E+01,	2.601E+01,,	-0.308
C,EU-152	,NO ,	-1.875E+01,	8.020E+00,	1.022E+01,,	-1.835
C,EU-154	,NO ,	3.134E-01,	4.258E+00,	7.027E+00,,	0.045
C,AC-228	,NO ,	-1.780E+00,	1.032E+01,	1.365E+01,,	-0.130
C,TH-232	,NO ,	-1.771E+00,	1.026E+01,	1.358E+01,,	-0.130
C,U-235	,NO ,	2.904E+01,	1.877E+01,	2.715E+01,,	1.070
C,U-238	,NO ,	-5.091E+01,	2.181E+02,	3.586E+02,,	-0.142
C,AM-241	,NO ,	-2.352E+01,	3.181E+01,	4.302E+01,,	-0.547

Summary of Nuclide Activity

Page : 2

Sample ID : 04L28833-3

Acquisition date : 9-JUN-2006 05:02:56

Total number of lines in spectrum	18	
Number of unidentified lines	14	
Number of lines tentatively identified by NID	4	22.22%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.338E+00	1.338E+00	44.10E+00	3296.67	
RA-226	1600.00Y	1.00	3.358E+01	3.358E+01	8.608E+01	256.33	
TH-228	1.91Y	1.01	2.257E+00	2.291E+00	4.302E+00	187.82	
U-235	7.04E+08Y	1.00	2.040E+00	2.040E+00	5.229E+00	256.33	K
			-----	-----			
		Total Activity :	3.922E+01	3.925E+01			

Grand Total Activity : 3.922E+01 3.925E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
 Sample ID : 04L28833-3

Page : 3
 Acquisition date : 9-JUN-2006 05:02:56

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.34	134	355	1.27	133.13	130	7	9.27E-03	51.2	6.64E-01	
3	77.14	78	414	1.34	154.74	147	12	5.36E-03	99.7	1.06E+00	
1	92.82	77	393	2.12	186.09	182	10	5.33E-03	****	1.54E+00	
1	140.19	113	382	1.33	280.82	276	9	7.84E-03	66.4	2.04E+00	
1	198.31	78	353	1.75	397.04	391	11	5.38E-03	99.2	1.87E+00	
1	295.21	64	184	1.36	590.80	587	9	4.40E-03	86.1	1.45E+00	
1	351.89	104	198	1.60	704.14	699	13	7.17E-03	64.8	1.28E+00	
1	595.75	46	87	1.52	1191.73	1186	10	3.19E-03	80.5	8.63E-01	
1	609.09	158	127	1.53	1218.41	1213	14	1.09E-02	37.1	8.49E-01	
1	1119.96	9	45	3.18	2239.70	2234	12	5.94E-04	****	5.27E-01	
1	1237.78	18	40	3.21	2475.21	2467	19	1.27E-03	****	4.88E-01	
1	1377.60	22	48	1.81	2754.67	2747	16	1.52E-03	****	4.49E-01	
1	1764.49	42	11	2.91	3527.90	3522	12	2.90E-03	53.6	3.77E-01	
1	1780.00	20	20	0.80	3558.89	3550	12	1.37E-03	99.6	3.75E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	18
Number of unidentified lines	14
Number of lines tentatively identified by NID	4
	22.22%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	1.338E+00	1.338E+00	44.10E+00	3296.67			
RA-226	1600.00Y	1.00	3.358E+01	3.358E+01	8.608E+01	256.33			
TH-228	1.91Y	1.01	2.577E+00	2.615E+00	4.276E+00	163.49			
Total Activity :			3.750E+01	3.754E+01					

Grand Total Activity : 3.750E+01 3.754E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.338E+00	4.410E+01	4.110E+01	0.000E+00	0.033
RA-226	3.358E+01	8.608E+01	1.019E+02	0.000E+00	0.330
TH-228	2.615E+00	4.276E+00	8.115E+00	0.000E+00	0.322

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.672E+00		2.753E+01	4.564E+01	0.000E+00	0.037
NA-24	-3.128E+01		2.945E+01	Half-Life too short		
CR-51	-3.334E+01		3.443E+01	5.458E+01	0.000E+00	-0.611
MN-54	3.413E-01		2.842E+00	4.675E+00	0.000E+00	0.073
CO-57	2.755E+00		2.471E+00	4.264E+00	0.000E+00	0.646
CO-58	7.177E-02		3.386E+00	5.544E+00	0.000E+00	0.013
FE-59	2.776E+00		6.899E+00	1.162E+01	0.000E+00	0.239
CO-60	-1.532E-01		3.309E+00	5.635E+00	0.000E+00	-0.027
ZN-65	9.119E+00		7.950E+00	1.220E+01	0.000E+00	0.747
SE-75	-4.500E+00		3.861E+00	6.161E+00	0.000E+00	-0.730
SR-85	1.796E+01		3.800E+00	7.308E+00	0.000E+00	2.458
Y-88	-1.565E+00		3.616E+00	5.643E+00	0.000E+00	-0.277
NB-94	1.607E+00		2.581E+00	4.422E+00	0.000E+00	0.364
NB-95	2.824E+00		3.268E+00	5.644E+00	0.000E+00	0.500
ZR-95	1.245E+00		5.638E+00	9.395E+00	0.000E+00	0.133
MO-99	-5.890E+02		8.344E+02	1.308E+03	0.000E+00	-0.450
RU-103	2.315E+00		3.622E+00	6.154E+00	0.000E+00	0.376
RU-106	1.208E+01		2.704E+01	4.379E+01	0.000E+00	0.276
AG-110m	-1.553E+00		2.767E+00	4.442E+00	0.000E+00	-0.350
SN-113	-3.300E-01		3.929E+00	6.363E+00	0.000E+00	-0.052
SB-124	5.455E+00		6.240E+00	5.422E+00	0.000E+00	1.006
SB-125	-4.801E-01		7.960E+00	1.322E+01	0.000E+00	-0.036
TE-129M	3.826E+00		3.915E+01	6.519E+01	0.000E+00	0.059
I-131	-2.037E-01		9.891E+00	1.614E+01	0.000E+00	-0.013
BA-133	8.105E+00		4.721E+00	7.195E+00	0.000E+00	1.126
CS-134	1.029E+01		4.842E+00	6.290E+00	0.000E+00	1.636
CS-136	3.716E+00		6.304E+00	1.068E+01	0.000E+00	0.348
CS-137	1.251E+00		2.933E+00	4.987E+00	0.000E+00	0.251
CE-139	-1.393E+00		2.708E+00	4.401E+00	0.000E+00	-0.317
BA-140	-5.884E+00		2.117E+01	3.418E+01	0.000E+00	-0.172
LA-140	-5.793E-01		7.181E+00	1.179E+01	0.000E+00	-0.049
CE-141	7.468E-01		6.833E+00	9.749E+00	0.000E+00	0.077
CE-144	2.625E+01		2.221E+01	3.326E+01	0.000E+00	0.789
EU-152	-6.206E+00		1.008E+01	1.345E+01	0.000E+00	-0.461
EU-154	5.494E+00		5.024E+00	8.661E+00	0.000E+00	0.634
AC-228	-7.453E-01		1.040E+01	1.768E+01	0.000E+00	-0.042
TH-232	-7.416E-01		1.034E+01	1.759E+01	0.000E+00	-0.042
U-235	3.507E+00		2.327E+01	3.326E+01	0.000E+00	0.105
U-238	1.620E+02		3.034E+02	5.195E+02	0.000E+00	0.312
AM-241	-1.358E+01		2.814E+01	4.383E+01	0.000E+00	-0.310

A,04L28833-3	,06/09/2006	09:52,05/25/2006	09:15,	3.096E+00,WG	L28833-3	EX
B,04L28833-3	,LIBD	,06/02/2006	09:04,	043L082004		
C,K-40	,YES,	1.338E+00,	4.410E+01,	4.110E+01,,	0.033	
C,RA-226	,YES,	3.358E+01,	8.608E+01,	1.019E+02,,	0.330	
C,TH-228	,YES,	2.615E+00,	4.276E+00,	8.115E+00,,	0.322	
C,BE-7	,NO,	1.672E+00,	2.753E+01,	4.564E+01,,	0.037	
C,CR-51	,NO,	-3.334E+01,	3.443E+01,	5.458E+01,,	-0.611	
C,MN-54	,NO,	3.413E-01,	2.842E+00,	4.675E+00,,	0.073	
C,CO-57	,NO,	2.755E+00,	2.471E+00,	4.264E+00,,	0.646	
C,CO-58	,NO,	7.177E-02,	3.386E+00,	5.544E+00,,	0.013	
C,FE-59	,NO,	2.776E+00,	6.899E+00,	1.162E+01,,	0.239	
C,CO-60	,NO,	-1.532E-01,	3.309E+00,	5.635E+00,,	-0.027	
C,ZN-65	,NO,	9.119E+00,	7.950E+00,	1.220E+01,,	0.747	
C,SE-75	,NO,	-4.500E+00,	3.861E+00,	6.161E+00,,	-0.730	
C,SR-85	,NO,	1.796E+01,	3.800E+00,	7.308E+00,,	2.458	
C,Y-88	,NO,	-1.565E+00,	3.616E+00,	5.643E+00,,	-0.277	
C,NB-94	,NO,	1.607E+00,	2.581E+00,	4.422E+00,,	0.364	
C,NB-95	,NO,	2.824E+00,	3.268E+00,	5.644E+00,,	0.500	
C,ZR-95	,NO,	1.245E+00,	5.638E+00,	9.395E+00,,	0.133	
C,MO-99	,NO,	-5.890E+02,	8.344E+02,	1.308E+03,,	-0.450	
C,RU-103	,NO,	2.315E+00,	3.622E+00,	6.154E+00,,	0.376	
C,RU-106	,NO,	1.208E+01,	2.704E+01,	4.379E+01,,	0.276	
C,AG-110m	,NO,	-1.553E+00,	2.767E+00,	4.442E+00,,	-0.350	
C,SN-113	,NO,	-3.300E-01,	3.929E+00,	6.363E+00,,	-0.052	
C,SB-124	,NO,	5.455E+00,	6.240E+00,	5.422E+00,,	1.006	
C,SB-125	,NO,	-4.801E-01,	7.960E+00,	1.322E+01,,	-0.036	
C,TE-129M	,NO,	3.826E+00,	3.915E+01,	6.519E+01,,	0.059	
C,I-131	,NO,	-2.037E-01,	9.891E+00,	1.614E+01,,	-0.013	
C,BA-133	,NO,	8.105E+00,	4.721E+00,	7.195E+00,,	1.126	
C,CS-134	,NO,	1.029E+01,	4.842E+00,	6.290E+00,,	1.636	
C,CS-136	,NO,	3.716E+00,	6.304E+00,	1.068E+01,,	0.348	
C,CS-137	,NO,	1.251E+00,	2.933E+00,	4.987E+00,,	0.251	
C,CE-139	,NO,	-1.393E+00,	2.708E+00,	4.401E+00,,	-0.317	
C,BA-140	,NO,	-5.884E+00,	2.117E+01,	3.418E+01,,	-0.172	
C,LA-140	,NO,	-5.793E-01,	7.181E+00,	1.179E+01,,	-0.049	
C,CE-141	,NO,	7.468E-01,	6.833E+00,	9.749E+00,,	0.077	
C,CE-144	,NO,	2.625E+01,	2.221E+01,	3.326E+01,,	0.789	
C,EU-152	,NO,	-6.206E+00,	1.008E+01,	1.345E+01,,	-0.461	
C,EU-154	,NO,	5.494E+00,	5.024E+00,	8.661E+00,,	0.634	
C,AC-228	,NO,	-7.453E-01,	1.040E+01,	1.768E+01,,	-0.042	
C,TH-232	,NO,	-7.416E-01,	1.034E+01,	1.759E+01,,	-0.042	
C,U-235	,NO,	3.507E+00,	2.327E+01,	3.326E+01,,	0.105	
C,U-238	,NO,	1.620E+02,	3.034E+02,	5.195E+02,,	0.312	
C,AM-241	,NO,	-1.358E+01,	2.814E+01,	4.383E+01,,	-0.310	

Summary of Nuclide Activity

Sample ID : 10L28833-4

Acquisition date : 9-JUN-2006 05:03:53

Total number of lines in spectrum	23	
Number of unidentified lines	20	
Number of lines tentatively identified by NID	3	13.04%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.100E+01	3.100E+01	4.813E+01	155.29	
TH-228	1.91Y	1.01	3.353E+00	3.403E+00	5.717E+00	168.00	
			-----	-----			
		Total Activity :	3.435E+01	3.440E+01			

Grand Total Activity :	3.435E+01	3.440E+01
------------------------	-----------	-----------

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 10L28833-4

Page : 3
Acquisition date : 9-JUN-2006 05:03:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.42	208	1061	1.57	131.96	128	9	9.52E-03	59.8	6.37E-01	
2	74.88	192	1087	1.49	148.87	142	17	8.78E-03	68.1	8.82E-01	
2	77.17	467	821	1.22	153.46	142	17	2.13E-02	23.8	9.45E-01	
1	87.34	118	849	1.18	173.82	171	7	5.39E-03	87.7	1.19E+00	
1	140.25	187	827	1.47	279.69	276	8	8.52E-03	55.3	1.68E+00	
1	198.38	81	696	1.56	395.98	392	9	3.70E-03	****	1.55E+00	
1	242.26	535	506	1.57	483.80	472	21	2.44E-02	17.5	1.39E+00	
1	295.35	906	498	1.24	590.02	585	11	4.14E-02	11.6	1.21E+00	
1	352.06	1448	508	1.28	703.50	697	14	6.61E-02	8.8	1.07E+00	
1	596.16	140	222	4.46	1192.00	1183	15	6.37E-03	49.0	7.06E-01	
1	609.45	1472	199	1.50	1218.60	1211	15	6.72E-02	7.0	6.94E-01	
1	768.79	144	103	1.59	1537.50	1532	12	6.60E-03	33.1	5.78E-01	
1	934.10	91	117	2.90	1868.36	1860	19	4.17E-03	62.1	4.97E-01	
1	1120.51	307	72	1.79	2241.52	2235	13	1.40E-02	17.2	4.33E-01	
1	1155.68	57	53	2.53	2311.91	2306	12	2.62E-03	58.3	4.23E-01	
1	1238.43	82	93	1.54	2477.57	2471	12	3.73E-03	54.6	4.01E-01	
1	1378.03	128	22	2.08	2757.04	2752	11	5.87E-03	22.6	3.71E-01	
1	1408.28	64	33	2.73	2817.61	2812	12	2.91E-03	43.7	3.65E-01	T
1	1729.84	68	15	2.48	3461.44	3454	16	3.09E-03	37.2	3.17E-01	
1	1764.93	208	63	2.10	3531.71	3523	20	9.51E-03	24.9	3.13E-01	
1	2007.94	21	11	2.74	4018.34	4013	10	9.79E-04	70.6	2.90E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	23	
Number of unidentified lines	20	
Number of lines tentatively identified by NID	3	13.04%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.100E+01	3.100E+01	4.813E+01	155.29	
TH-228	1.91Y	1.01	3.353E+00	3.403E+00	5.717E+00	168.00	
Total Activity :			3.435E+01	3.440E+01			

Grand Total Activity : 3.435E+01 3.440E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.100E+01	4.813E+01	5.135E+01	0.000E+00	0.604
TH-228	3.403E+00	5.717E+00	9.243E+00	0.000E+00	0.368

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	3.414E+01		3.158E+01	5.415E+01	0.000E+00	0.631
NA-24	-4.350E+01		2.917E+01	Half-Life too short		
CR-51	-3.210E+01		3.724E+01	5.989E+01	0.000E+00	-0.536
MN-54	-1.251E+00		3.245E+00	5.265E+00	0.000E+00	-0.238
CO-57	-1.421E+00		3.226E+00	5.295E+00	0.000E+00	-0.268
CO-58	-4.167E-01		3.615E+00	5.946E+00	0.000E+00	-0.070
FE-59	1.276E+00		7.469E+00	1.250E+01	0.000E+00	0.102
CO-60	-4.557E-01		3.168E+00	5.146E+00	0.000E+00	-0.089
ZN-65	3.949E+01		1.025E+01	1.735E+01	0.000E+00	2.276
SE-75	-2.281E+00		4.394E+00	7.200E+00	0.000E+00	-0.317
SR-85	2.052E+01		3.917E+00	7.360E+00	0.000E+00	2.788
Y-88	-2.833E+00		3.725E+00	5.747E+00	0.000E+00	-0.493
NB-94	-2.074E-01		2.999E+00	4.865E+00	0.000E+00	-0.043
NB-95	1.193E+01		4.111E+00	6.745E+00	0.000E+00	1.768
ZR-95	1.610E+00		6.228E+00	9.942E+00	0.000E+00	0.162
MO-99	-3.790E+02		9.433E+02	1.540E+03	0.000E+00	-0.246
RU-103	7.419E-01		3.891E+00	6.484E+00	0.000E+00	0.114
RU-106	-1.335E+01		2.981E+01	4.580E+01	0.000E+00	-0.291
AG-110m	-2.770E+00		3.075E+00	4.826E+00	0.000E+00	-0.574
SN-113	-5.295E-01		4.460E+00	7.247E+00	0.000E+00	-0.073
SB-124	3.395E+00		7.588E+00	5.690E+00	0.000E+00	0.597
SB-125	1.670E-01		9.617E+00	1.563E+01	0.000E+00	0.011
TE-129M	4.595E+00		4.646E+01	7.746E+01	0.000E+00	0.059
I-131	6.244E+00		1.128E+01	1.850E+01	0.000E+00	0.338
BA-133	7.729E+01		6.616E+00	1.215E+01	0.000E+00	6.359
CS-134	5.946E+01		7.426E+00	9.596E+00	0.000E+00	6.197
CS-136	-2.942E+00		6.772E+00	1.097E+01	0.000E+00	-0.268
CS-137	2.207E+00		3.275E+00	5.497E+00	0.000E+00	0.402
CE-139	-1.690E+00		3.407E+00	5.530E+00	0.000E+00	-0.306
BA-140	-3.077E+00		2.376E+01	3.901E+01	0.000E+00	-0.079
LA-140	-1.796E+00		7.877E+00	1.283E+01	0.000E+00	-0.140
CE-141	-4.035E-01		8.544E+00	1.191E+01	0.000E+00	-0.034
CE-144	-8.456E+00		2.922E+01	4.062E+01	0.000E+00	-0.208
EU-152	-7.117E+00		1.160E+01	1.566E+01	0.000E+00	-0.454
EU-154	-3.779E+00		6.609E+00	1.082E+01	0.000E+00	-0.349
RA-226	-7.880E+01		8.248E+01	1.274E+02	0.000E+00	-0.619
AC-228	-9.281E-01		1.269E+01	1.994E+01	0.000E+00	-0.047
TH-232	-9.236E-01		1.262E+01	1.984E+01	0.000E+00	-0.047
U-235	2.076E+01		2.913E+01	4.142E+01	0.000E+00	0.501
U-238	-4.178E+02		3.417E+02	5.214E+02	0.000E+00	-0.801
AM-241	-2.925E+01		3.172E+01	4.462E+01	0.000E+00	-0.656

A,10L28833-4	,06/09/2006	11:09,05/25/2006	11:23,	3.293E+00,WG	L28833-4	EX
B,10L28833-4	,LIBD			,06/07/2006	09:32,1035L091004	
C,K-40	,YES,	3.100E+01,	4.813E+01,	5.135E+01,,	0.604	
C,TH-228	,YES,	3.403E+00,	5.717E+00,	9.243E+00,,	0.368	
C,BE-7	,NO,	3.414E+01,	3.158E+01,	5.415E+01,,	0.631	
C,CR-51	,NO,	-3.210E+01,	3.724E+01,	5.989E+01,,	-0.536	
C,MN-54	,NO,	-1.251E+00,	3.245E+00,	5.265E+00,,	-0.238	
C,CO-57	,NO,	-1.421E+00,	3.226E+00,	5.295E+00,,	-0.268	
C,CO-58	,NO,	-4.167E-01,	3.615E+00,	5.946E+00,,	-0.070	
C,FE-59	,NO,	1.276E+00,	7.469E+00,	1.250E+01,,	0.102	
C,CO-60	,NO,	-4.557E-01,	3.168E+00,	5.146E+00,,	-0.089	
C,ZN-65	,NO,	3.949E+01,	1.025E+01,	1.735E+01,,	2.276	
C,SE-75	,NO,	-2.281E+00,	4.394E+00,	7.200E+00,,	-0.317	
C,SR-85	,NO,	2.052E+01,	3.917E+00,	7.360E+00,,	2.788	
C,Y-88	,NO,	-2.833E+00,	3.725E+00,	5.747E+00,,	-0.493	
C,NB-94	,NO,	-2.074E-01,	2.999E+00,	4.865E+00,,	-0.043	
C,NB-95	,NO,	1.193E+01,	4.111E+00,	6.745E+00,,	1.768	
C,ZR-95	,NO,	1.610E+00,	6.228E+00,	9.942E+00,,	0.162	
C,MO-99	,NO,	-3.790E+02,	9.433E+02,	1.540E+03,,	-0.246	
C,RU-103	,NO,	7.419E-01,	3.891E+00,	6.484E+00,,	0.114	
C,RU-106	,NO,	-1.335E+01,	2.981E+01,	4.580E+01,,	-0.291	
C,AG-110m	,NO,	-2.770E+00,	3.075E+00,	4.826E+00,,	-0.574	
C,SN-113	,NO,	-5.295E-01,	4.460E+00,	7.247E+00,,	-0.073	
C,SB-124	,NO,	3.395E+00,	7.588E+00,	5.690E+00,,	0.597	
C,SB-125	,NO,	1.670E-01,	9.617E+00,	1.563E+01,,	0.011	
C,TE-129M	,NO,	4.595E+00,	4.646E+01,	7.746E+01,,	0.059	
C,I-131	,NO,	6.244E+00,	1.128E+01,	1.850E+01,,	0.338	
C,BA-133	,NO,	7.729E+01,	6.616E+00,	1.215E+01,,	6.359	
C,CS-134	,NO,	5.946E+01,	7.426E+00,	9.596E+00,,	6.197	
C,CS-136	,NO,	-2.942E+00,	6.772E+00,	1.097E+01,,	-0.268	
C,CS-137	,NO,	2.207E+00,	3.275E+00,	5.497E+00,,	0.402	
C,CE-139	,NO,	-1.690E+00,	3.407E+00,	5.530E+00,,	-0.306	
C,BA-140	,NO,	-3.077E+00,	2.376E+01,	3.901E+01,,	-0.079	
C,LA-140	,NO,	-1.796E+00,	7.877E+00,	1.283E+01,,	-0.140	
C,CE-141	,NO,	-4.035E-01,	8.544E+00,	1.191E+01,,	-0.034	
C,CE-144	,NO,	-8.456E+00,	2.922E+01,	4.062E+01,,	-0.208	
C,EU-152	,NO,	-7.117E+00,	1.160E+01,	1.566E+01,,	-0.454	
C,EU-154	,NO,	-3.779E+00,	6.609E+00,	1.082E+01,,	-0.349	
C,RA-226	,NO,	-7.880E+01,	8.248E+01,	1.274E+02,,	-0.619	
C,AC-228	,NO,	-9.281E-01,	1.269E+01,	1.994E+01,,	-0.047	
C,TH-232	,NO,	-9.236E-01,	1.262E+01,	1.984E+01,,	-0.047	
C,U-235	,NO,	2.076E+01,	2.913E+01,	4.142E+01,,	0.501	
C,U-238	,NO,	-4.178E+02,	3.417E+02,	5.214E+02,,	-0.801	
C,AM-241	,NO,	-2.925E+01,	3.172E+01,	4.462E+01,,	-0.656	

Sec. Review: Analyst: *OV* LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 09:39:44.17
 TBE11 P-20610B HpGe ***** Aquisition Date/Time: 9-JUN-2006 05:04:04.32

LIMS No., Customer Name, Client ID: WG L28833-5 EXELON ZION

Sample ID : 11L28833-5 Smple Date: 24-MAY-2006 11:35:00.
 Sample Type : WG Geometry : 113L082304
 Quantity : 3.20950E+00 L BKGFILE : 11BG060306MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:04:06.61
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:04:01.31
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	66.53	120	628	1.53	132.08	6.94E-01	8.20E-03	34.5	
2	0	139.89*	57	441	1.79	279.22	1.90E+00	3.91E-03	71.3	
3	0	185.05*	86	433	1.45	369.79	1.80E+00	5.88E-03	52.5	
4	0	295.30*	90	262	1.29	590.83	1.37E+00	6.15E-03	39.2	
5	0	352.00*	93	180	0.98	704.46	1.20E+00	6.34E-03	32.9	
6	0	596.19	82	86	1.58	1193.61	8.03E-01	5.59E-03	24.7	
7	0	609.36*	91	91	1.38	1219.98	7.90E-01	6.21E-03	25.5	
8	0	819.42	20	21	1.04	1640.39	6.25E-01	1.35E-03	43.7	
9	0	911.39*	18	45	1.16	1824.37	5.74E-01	1.25E-03	94.8	
10	0	1120.90*	20	50	1.16	2243.23	4.86E-01	1.38E-03	74.5	
11	0	1460.63*	50	22	1.71	2921.76	3.92E-01	3.44E-03	32.9	
12	0	1761.69	49	13	1.79	3522.36	3.39E-01	3.35E-03	21.5	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	50	10.67*	3.919E-01	6.937E+01	6.937E+01	65.89
AC-228	835.50	-----	1.75	6.158E-01	-----	Line Not Found	-----
	911.07	18	27.70*	5.744E-01	6.601E+00	6.635E+00	189.68
U-235	143.76	-----	10.50*	1.906E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.876E+00	-----	Line Not Found	-----
	185.71	86	54.00	1.802E+00	5.092E+00	5.092E+00	105.08
	205.31	-----	4.70	1.718E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity
 Sample ID : 11L28833-5

Page : 2
 Acquisition date : 9-JUN-2006 05:04:04

Total number of lines in spectrum 12
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 4 33.33%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	6.937E+01	6.937E+01	4.571E+01	65.89	
AC-228	5.75Y	1.01	6.601E+00	6.635E+00	12.59E+00	189.68	
U-235	7.04E+08Y	1.00	5.092E+00	5.092E+00	5.350E+00	105.08	K
Total Activity :			8.106E+01	8.109E+01			

Grand Total Activity : 8.106E+01 8.109E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Page : 3

Sample ID : 11L28833-5

Acquisition date : 9-JUN-2006 05:04:04

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.53	120	628	1.53	132.08	130	6	8.20E-03	68.9	6.94E-01	
0	139.89	57	441	1.79	279.22	275	9	3.91E-03	****	1.90E+00	
0	295.30	90	262	1.29	590.83	585	12	6.15E-03	78.4	1.37E+00	
0	352.00	93	180	0.98	704.46	699	11	6.34E-03	65.7	1.20E+00	
0	596.19	82	86	1.58	1193.61	1189	11	5.59E-03	49.5	8.03E-01	
0	609.36	91	91	1.38	1219.98	1215	11	6.21E-03	51.0	7.90E-01	
0	819.42	20	21	1.04	1640.39	1637	6	1.35E-03	87.4	6.25E-01	T
0	1120.90	20	50	1.16	2243.23	2237	10	1.38E-03	****	4.86E-01	
0	1761.69	49	13	1.79	3522.36	3515	14	3.35E-03	43.0	3.39E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 12
 Number of unidentified lines 8
 Number of lines tentatively identified by NID 4 33.33%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	Error	%Error	Flags
			Uncorrected	Decay Corr						
K-40	1.28E+09Y	1.00	6.937E+01	6.937E+01	4.571E+01	65.89				
AC-228	5.75Y	1.01	6.601E+00	6.635E+00	12.59E+00	189.68				
U-235	7.04E+08Y	1.00	5.092E+00	5.092E+00	5.350E+00	105.08				
Total Activity :			8.106E+01	8.109E+01						

Grand Total Activity : 8.106E+01 8.109E+01

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	6.937E+01	4.571E+01	4.681E+01	0.000E+00	1.482
AC-228	6.635E+00	1.259E+01	1.716E+01	0.000E+00	0.387
U-235	5.092E+00	5.350E+00	4.012E+01	0.000E+00	0.127

---- Non-Identified Nuclides ----

Key-Line Activity	K.L.	Act error	MDA	MDA error	Act/MDA
----------------------	------	-----------	-----	-----------	---------

Nuclide	(pCi/L)	Ided	(pCi/L)	(pCi/L)	
BE-7	-8.778E+00		3.104E+01	4.998E+01	0.000E+00 -0.176
NA-24	-5.485E+01		6.601E+01	Half-Life too short	
CR-51	-3.258E+01		3.809E+01	6.113E+01	0.000E+00 -0.533
MN-54	1.353E+00		2.887E+00	4.875E+00	0.000E+00 0.277
CO-57	1.401E+00		3.152E+00	5.251E+00	0.000E+00 0.267
CO-58	6.135E-01		3.505E+00	5.183E+00	0.000E+00 0.118
FE-59	-4.976E+00		7.417E+00	1.170E+01	0.000E+00 -0.425
CO-60	5.012E-01		2.945E+00	4.906E+00	0.000E+00 0.102
ZN-65	5.494E+00		8.373E+00	1.243E+01	0.000E+00 0.442
SE-75	-4.768E+00		4.453E+00	7.164E+00	0.000E+00 -0.666
SR-85	1.630E+01		4.038E+00	7.541E+00	0.000E+00 2.161
Y-88	-3.280E+00		3.491E+00	5.116E+00	0.000E+00 -0.641
NB-94	-3.292E-01		2.836E+00	4.648E+00	0.000E+00 -0.071
NB-95	4.210E+00		3.447E+00	6.069E+00	0.000E+00 0.694
ZR-95	-4.021E+00		6.060E+00	9.555E+00	0.000E+00 -0.421
MO-99	-3.556E+01		1.146E+03	1.882E+03	0.000E+00 -0.019
RU-103	1.534E+00		3.803E+00	6.320E+00	0.000E+00 0.243
RU-106	1.402E+01		2.970E+01	4.984E+01	0.000E+00 0.281
AG-110m	1.080E+00		2.956E+00	4.990E+00	0.000E+00 0.216
SN-113	1.022E+00		4.399E+00	7.297E+00	0.000E+00 0.140
SB-124	-2.488E+00		8.333E+00	5.573E+00	0.000E+00 -0.446
SB-125	1.062E+00		8.784E+00	1.447E+01	0.000E+00 0.073
TE-129M	-3.779E+00		4.636E+01	7.547E+01	0.000E+00 -0.050
I-131	-1.255E+01		1.200E+01	1.894E+01	0.000E+00 -0.663
BA-133	8.957E+00		4.962E+00	7.608E+00	0.000E+00 1.177
CS-134	4.438E+00		7.227E+00	5.756E+00	0.000E+00 0.771
CS-136	4.196E+00	+	3.668E+00	1.082E+01	0.000E+00 0.388
CS-137	3.518E+00		3.188E+00	5.589E+00	0.000E+00 0.629
CE-139	-6.947E-01		3.181E+00	5.176E+00	0.000E+00 -0.134
BA-140	5.571E+00		2.543E+01	4.177E+01	0.000E+00 0.133
LA-140	4.906E-01		7.965E+00	1.329E+01	0.000E+00 0.037
CE-141	1.234E+00		8.461E+00	1.185E+01	0.000E+00 0.104
CE-144	7.753E+00		2.879E+01	4.058E+01	0.000E+00 0.191
EU-152	-4.330E+00		1.132E+01	1.547E+01	0.000E+00 -0.280
EU-154	8.465E-01		6.394E+00	1.057E+01	0.000E+00 0.080
RA-226	1.905E+01		7.913E+01	1.261E+02	0.000E+00 0.151
TH-228	-9.760E-01		6.422E+00	1.002E+01	0.000E+00 -0.097
TH-232	6.601E+00	+	1.252E+01	2.003E+01	0.000E+00 0.330
U-238	-1.246E+02		3.181E+02	5.141E+02	0.000E+00 -0.242
AM-241	-2.479E+01		4.324E+01	6.271E+01	0.000E+00 -0.395

A,11L28833-5	,06/09/2006	09:39,05/24/2006	11:35,	3.210E+00,WG	L28833-5 EX
B,11L28833-5	,LIBD		,06/07/2006	09:40,	113L082304
C,K-40	,YES,	6.937E+01,	4.571E+01,	4.681E+01,,	1.482
C,AC-228	,YES,	6.635E+00,	1.259E+01,	1.716E+01,,	0.387
C,U-235	,YES,	5.092E+00,	5.350E+00,	4.012E+01,,	0.127
C,BE-7	,NO,	-8.778E+00,	3.104E+01,	4.998E+01,,	-0.176
C,CR-51	,NO,	-3.258E+01,	3.809E+01,	6.113E+01,,	-0.533
C,MN-54	,NO,	1.353E+00,	2.887E+00,	4.875E+00,,	0.277
C,CO-57	,NO,	1.401E+00,	3.152E+00,	5.251E+00,,	0.267
C,CO-58	,NO,	6.135E-01,	3.505E+00,	5.183E+00,,	0.118
C,FE-59	,NO,	-4.976E+00,	7.417E+00,	1.170E+01,,	-0.425
C,CO-60	,NO,	5.012E-01,	2.945E+00,	4.906E+00,,	0.102
C,ZN-65	,NO,	5.494E+00,	8.373E+00,	1.243E+01,,	0.442
C,SE-75	,NO,	-4.768E+00,	4.453E+00,	7.164E+00,,	-0.666
C,SR-85	,NO,	1.630E+01,	4.038E+00,	7.541E+00,,	2.161
C,Y-88	,NO,	-3.280E+00,	3.491E+00,	5.116E+00,,	-0.641
C,NB-94	,NO,	-3.292E-01,	2.836E+00,	4.648E+00,,	-0.071
C,NB-95	,NO,	4.210E+00,	3.447E+00,	6.069E+00,,	0.694
C,ZR-95	,NO,	-4.021E+00,	6.060E+00,	9.555E+00,,	-0.421
C,MO-99	,NO,	-3.556E+01,	1.146E+03,	1.882E+03,,	-0.019
C,RU-103	,NO,	1.534E+00,	3.803E+00,	6.320E+00,,	0.243
C,RU-106	,NO,	1.402E+01,	2.970E+01,	4.984E+01,,	0.281
C,AG-110m	,NO,	1.080E+00,	2.956E+00,	4.990E+00,,	0.216
C,SN-113	,NO,	1.022E+00,	4.399E+00,	7.297E+00,,	0.140
C,SB-124	,NO,	-2.488E+00,	8.333E+00,	5.573E+00,,	-0.446
C,SB-125	,NO,	1.062E+00,	8.784E+00,	1.447E+01,,	0.073
C,TE-129M	,NO,	-3.779E+00,	4.636E+01,	7.547E+01,,	-0.050
C,I-131	,NO,	-1.255E+01,	1.200E+01,	1.894E+01,,	-0.663
C,BA-133	,NO,	8.957E+00,	4.962E+00,	7.608E+00,,	1.177
C,CS-134	,NO,	4.438E+00,	7.227E+00,	5.756E+00,,	0.771
C,CS-136	,NO,	4.196E+00,	3.668E+00,	1.082E+01,,	0.388
C,CS-137	,NO,	3.518E+00,	3.188E+00,	5.589E+00,,	0.629
C,CE-139	,NO,	-6.947E-01,	3.181E+00,	5.176E+00,,	-0.134
C,BA-140	,NO,	5.571E+00,	2.543E+01,	4.177E+01,,	0.133
C,LA-140	,NO,	4.906E-01,	7.965E+00,	1.329E+01,,	0.037
C,CE-141	,NO,	1.234E+00,	8.461E+00,	1.185E+01,,	0.104
C,CE-144	,NO,	7.753E+00,	2.879E+01,	4.058E+01,,	0.191
C,EU-152	,NO,	-4.330E+00,	1.132E+01,	1.547E+01,,	-0.280
C,EU-154	,NO,	8.465E-01,	6.394E+00,	1.057E+01,,	0.080
C,RA-226	,NO,	1.905E+01,	7.913E+01,	1.261E+02,,	0.151
C,TH-228	,NO,	-9.760E-01,	6.422E+00,	1.002E+01,,	-0.097
C,TH-232	,NO,	6.601E+00,	1.252E+01,	2.003E+01,,	0.330
C,U-238	,NO,	-1.246E+02,	3.181E+02,	5.141E+02,,	-0.242
C,AM-241	,NO,	-2.479E+01,	4.324E+01,	6.271E+01,,	-0.395

Sec. Review: Analyst: LIMS: _____

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 09:35:51.65
 TBE13 P-10727B HpGe ***** Aquisition Date/Time: 9-JUN-2006 05:04:15.79

LIMS No., Customer Name, Client ID: WG L28833-6 EXELON ZION

Sample ID : 13L28833-6 Smple Date: 24-MAY-2006 10:14:00.
 Sample Type : WG Geometry : 133L082404
 Quantity : 3.08320E+00 L BKGFILE : 13BG060306MT
 Start Channel : 25 Energy Tol : 1.00000 Real Time : 0 04:06:15.51
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:06:11.14
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	10	33.87	155	14	1.18	67.88	1.16E-02	1.05E-02	14.1	2.32E+00
2	10	36.00	280	124	2.43	72.15	2.13E-02	1.89E-02	15.7	
3	10	39.14	219	238	2.27	78.42	4.50E-02	1.48E-02	19.5	
4	10	42.89	174	391	2.55	85.90	9.17E-02	1.18E-02	26.4	
5	10	45.96*	194	329	2.10	92.04	1.47E-01	1.31E-02	17.3	
6	1	92.84*	97	800	1.77	185.75	1.74E+00	6.54E-03	64.4	9.99E+00
7	1	139.52*	128	573	2.42	279.05	2.27E+00	8.65E-03	37.6	3.14E+00
8	1	185.62*	40	514	1.09	371.21	2.18E+00	2.73E-03	116.7	5.79E-01
9	1	198.20*	27	445	1.91	396.36	2.13E+00	1.80E-03	154.0	5.38E+00
10	1	238.13*	28	450	1.66	476.19	1.94E+00	1.87E-03	168.8	3.65E+00
11	1	295.00*	145	306	2.06	589.89	1.70E+00	9.82E-03	27.3	2.40E+00
12	1	351.71*	107	238	1.15	703.28	1.51E+00	7.23E-03	32.0	1.04E+00
13	1	582.86*	12	178	1.66	1165.57	1.04E+00	8.41E-04	261.5	1.52E+00
14	1	596.10	63	148	2.02	1192.06	1.02E+00	4.26E-03	42.3	1.93E+00
15	1	609.01*	245	117	1.73	1217.89	1.01E+00	1.66E-02	11.9	1.81E+00
16	1	911.47*	24	131	11.25	1823.13	7.36E-01	1.65E-03	119.8	2.76E+00
17	1	1120.12*	30	58	2.00	2240.84	6.27E-01	2.06E-03	59.3	4.24E+00
18	1	1460.82*	8	23	2.75	2923.23	5.14E-01	5.13E-04	254.0	3.00E+00
19	1	1763.76*	46	33	2.78	3530.33	4.55E-01	3.10E-03	35.5	1.68E+00

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	8	10.67*	5.143E-01	8.200E+00	8.200E+00	508.00
RA-226	186.21	40	3.28*	2.179E+00	3.349E+01	3.349E+01	233.32
AC-228	835.50	-----	1.75	7.877E-01	-----	Line Not Found	-----
	911.07	24	27.70*	7.358E-01	7.099E+00	7.136E+00	239.51
TH-228	238.63	28	44.60*	1.940E+00	1.894E+00	1.924E+00	337.51
	240.98	-----	3.95	1.927E+00	-----	Line Not Found	-----
TH-232	583.14	12	30.25	1.040E+00	2.344E+00	2.344E+00	522.96
	911.07	24	27.70*	7.358E-01	7.099E+00	7.099E+00	239.51
	969.11	-----	16.60	7.014E-01	-----	Line Not Found	-----
U-235	143.76	-----	10.50*	2.278E+00	-----	Line Not Found	-----
	163.35	-----	4.70	2.256E+00	-----	Line Not Found	-----

185.71	40	54.00	2.179E+00	2.034E+00	2.034E+00	233.32
205.31	-----	4.70	2.093E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 13L28833-6

Acquisition date : 9-JUN-2006 05:04:15

Total number of lines in spectrum	19	
Number of unidentified lines	14	
Number of lines tentatively identified by NID	5	26.32%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.200E+00	8.200E+00	41.66E+00	508.00	
RA-226	1600.00Y	1.00	3.349E+01	3.349E+01	7.814E+01	233.32	
AC-228	5.75Y	1.01	7.099E+00	7.136E+00	17.09E+00	239.51	
TH-228	1.91Y	1.02	1.894E+00	1.924E+00	6.494E+00	337.51	
TH-232	1.41E+10Y	1.00	7.099E+00	7.099E+00	17.00E+00	239.51	
U-235	7.04E+08Y	1.00	2.034E+00	2.034E+00	4.746E+00	233.32	K
Total Activity :			5.981E+01	5.988E+01			

Grand Total Activity : 5.981E+01 5.988E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 13L28833-6

Page : 3
Acquisition date : 9-JUN-2006 05:04:15

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
10	33.87	155	14	1.18	67.88	64	33	1.05E-02	28.2	1.16E-02	
10	36.00	280	124	2.43	72.15	64	33	1.89E-02	31.3	2.13E-02	
10	39.14	219	238	2.27	78.42	64	33	1.48E-02	39.0	4.50E-02	
10	42.89	174	391	2.55	85.90	64	33	1.18E-02	52.7	9.17E-02	
10	45.96	194	329	2.10	92.04	64	33	1.31E-02	34.6	1.47E-01	
1	92.84	97	800	1.77	185.75	181	12	6.54E-03	****	1.74E+00	
1	139.52	128	573	2.42	279.05	274	10	8.65E-03	75.2	2.27E+00	
1	198.20	27	445	1.91	396.36	392	9	1.80E-03	****	2.13E+00	
1	295.00	145	306	2.06	589.89	584	12	9.82E-03	54.6	1.70E+00	
1	351.71	107	238	1.15	703.28	699	10	7.23E-03	63.9	1.51E+00	
1	596.10	63	148	2.02	1192.06	1187	13	4.26E-03	84.5	1.02E+00	
1	609.01	245	117	1.73	1217.89	1212	12	1.66E-02	23.8	1.01E+00	
1	1120.12	30	58	2.00	2240.84	2235	11	2.06E-03	****	6.27E-01	
1	1763.76	46	33	2.78	3530.33	3522	15	3.10E-03	71.0	4.55E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	19
Number of unidentified lines	14
Number of lines tentatively identified by NID	5
	26.32%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/L	Decay Corr pCi/L			
K-40	1.28E+09Y	1.00	8.200E+00	8.200E+00	41.66E+00	508.00	
RA-226	1600.00Y	1.00	3.349E+01	3.349E+01	7.814E+01	233.32	
AC-228	5.75Y	1.01	4.755E+00	4.780E+00	21.07E+00	440.78	
TH-228	1.91Y	1.02	1.894E+00	1.924E+00	6.494E+00	337.51	
TH-232	1.41E+10Y	1.00	2.344E+00	2.344E+00	12.26E+00	522.96	
Total Activity :			5.068E+01	5.074E+01			

Grand Total Activity : 5.068E+01 5.074E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
TH-232	911.07	AC-228	911.07

Combined Activity-MDA Report

---- Identified Nuclides ----

Activity	Act error	MDA	MDA error	Act/MDA
----------	-----------	-----	-----------	---------

Nuclide	(pCi/L)		(pCi/L)		
K-40	8.200E+00	4.166E+01	4.301E+01	0.000E+00	0.191
RA-226	3.349E+01	7.814E+01	1.079E+02	0.000E+00	0.310
AC-228	4.780E+00	2.107E+01	1.788E+01	0.000E+00	0.267
TH-228	1.924E+00	6.494E+00	8.318E+00	0.000E+00	0.231
TH-232	2.344E+00	1.226E+01	1.790E+01	0.000E+00	0.131

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	9.289E-01		2.876E+01	4.743E+01	0.000E+00	0.020
NA-24	-8.487E+01		6.771E+01	Half-Life too short		
CR-51	-6.588E+00		3.582E+01	5.852E+01	0.000E+00	-0.113
MN-54	7.643E-02		2.885E+00	4.797E+00	0.000E+00	0.016
CO-57	1.017E+00		2.855E+00	4.659E+00	0.000E+00	0.218
CO-58	1.488E-02		3.360E+00	5.472E+00	0.000E+00	0.003
FE-59	6.329E-01		6.660E+00	1.112E+01	0.000E+00	0.057
CO-60	-2.200E+00		2.945E+00	4.539E+00	0.000E+00	-0.485
ZN-65	9.402E+00		7.775E+00	1.193E+01	0.000E+00	0.788
SE-75	4.218E-01		4.038E+00	6.725E+00	0.000E+00	0.063
SR-85	2.330E+01		3.784E+00	7.361E+00	0.000E+00	3.166
Y-88	-2.558E+00		3.296E+00	5.057E+00	0.000E+00	-0.506
NB-94	-1.241E+00		2.812E+00	4.529E+00	0.000E+00	-0.274
NB-95	1.923E+00		3.508E+00	5.887E+00	0.000E+00	0.327
ZR-95	-4.738E+00		6.117E+00	9.613E+00	0.000E+00	-0.493
MO-99	2.093E+02		1.180E+03	1.951E+03	0.000E+00	0.107
RU-103	1.958E+00		3.721E+00	6.243E+00	0.000E+00	0.314
RU-106	-6.076E+00		2.846E+01	4.561E+01	0.000E+00	-0.133
AG-110m	1.207E+00		2.832E+00	4.773E+00	0.000E+00	0.253
SN-113	2.890E+00		4.063E+00	6.770E+00	0.000E+00	0.427
SB-124	-4.119E-04		7.756E+00	5.309E+00	0.000E+00	0.000
SB-125	-3.221E+00		8.264E+00	1.351E+01	0.000E+00	-0.238
TE-129M	1.141E+01		4.254E+01	7.099E+01	0.000E+00	0.161
I-131	1.320E+00		1.123E+01	1.839E+01	0.000E+00	0.072
BA-133	1.246E+01		4.809E+00	7.449E+00	0.000E+00	1.673
CS-134	1.546E+01		6.876E+00	6.385E+00	0.000E+00	2.422
CS-136	2.128E+00		6.465E+00	1.071E+01	0.000E+00	0.199
CS-137	-1.687E-01		3.192E+00	5.095E+00	0.000E+00	-0.033
CE-139	-3.657E-01		2.907E+00	4.783E+00	0.000E+00	-0.076
BA-140	2.712E+00		2.350E+01	3.862E+01	0.000E+00	0.070
LA-140	-6.006E+00		7.844E+00	1.209E+01	0.000E+00	-0.497
CE-141	6.508E+00		7.662E+00	1.113E+01	0.000E+00	0.585
CE-144	1.164E+01		2.484E+01	3.582E+01	0.000E+00	0.325
EU-152	-7.804E+00		1.104E+01	1.471E+01	0.000E+00	-0.531
EU-154	2.098E+00		5.827E+00	9.507E+00	0.000E+00	0.221
U-235	3.551E+00		2.649E+01	3.720E+01	0.000E+00	0.095
U-238	1.933E+02		3.413E+02	5.588E+02	0.000E+00	0.346
AM-241	-1.931E+01		2.549E+01	4.165E+01	0.000E+00	-0.464

A, 13L28833-6		,06/09/2006	09:35,05/24/2006	10:14,	3.083E+00,WG	L28833-6 EX
B, 13L28833-6		,LIBD	,06/07/2006	09:34,	133L082404	
C,K-40	,YES,	8.200E+00,	4.166E+01,	4.301E+01,,	0.191	
C,RA-226	,YES,	3.349E+01,	7.814E+01,	1.079E+02,,	0.310	
C,AC-228	,YES,	4.780E+00,	2.107E+01,	1.788E+01,,	0.267	
C,TH-228	,YES,	1.924E+00,	6.494E+00,	8.318E+00,,	0.231	
C,TH-232	,YES,	2.344E+00,	1.226E+01,	1.790E+01,,	0.131	
C,BE-7	,NO,	9.289E-01,	2.876E+01,	4.743E+01,,	0.020	
C,CR-51	,NO,	-6.588E+00,	3.582E+01,	5.852E+01,,	-0.113	
C,MN-54	,NO,	7.643E-02,	2.885E+00,	4.797E+00,,	0.016	
C,CO-57	,NO,	1.017E+00,	2.855E+00,	4.659E+00,,	0.218	
C,CO-58	,NO,	1.488E-02,	3.360E+00,	5.472E+00,,	0.003	
C,FE-59	,NO,	6.329E-01,	6.660E+00,	1.112E+01,,	0.057	
C,CO-60	,NO,	-2.200E+00,	2.945E+00,	4.539E+00,,	-0.485	
C,ZN-65	,NO,	9.402E+00,	7.775E+00,	1.193E+01,,	0.788	
C,SE-75	,NO,	4.218E-01,	4.038E+00,	6.725E+00,,	0.063	
C,SR-85	,NO,	2.330E+01,	3.784E+00,	7.361E+00,,	3.166	
C,Y-88	,NO,	-2.558E+00,	3.296E+00,	5.057E+00,,	-0.506	
C,NB-94	,NO,	-1.241E+00,	2.812E+00,	4.529E+00,,	-0.274	
C,NB-95	,NO,	1.923E+00,	3.508E+00,	5.887E+00,,	0.327	
C,ZR-95	,NO,	-4.738E+00,	6.117E+00,	9.613E+00,,	-0.493	
C,MO-99	,NO,	2.093E+02,	1.180E+03,	1.951E+03,,	0.107	
C,RU-103	,NO,	1.958E+00,	3.721E+00,	6.243E+00,,	0.314	
C,RU-106	,NO,	-6.076E+00,	2.846E+01,	4.561E+01,,	-0.133	
C,AG-110m	,NO,	1.207E+00,	2.832E+00,	4.773E+00,,	0.253	
C,SN-113	,NO,	2.890E+00,	4.063E+00,	6.770E+00,,	0.427	
C,SB-124	,NO,	-4.119E-04,	7.756E+00,	5.309E+00,,	0.000	
C,SB-125	,NO,	-3.221E+00,	8.264E+00,	1.351E+01,,	-0.238	
C,TE-129M	,NO,	1.141E+01,	4.254E+01,	7.099E+01,,	0.161	
C,I-131	,NO,	1.320E+00,	1.123E+01,	1.839E+01,,	0.072	
C,BA-133	,NO,	1.246E+01,	4.809E+00,	7.449E+00,,	1.673	
C,CS-134	,NO,	1.546E+01,	6.876E+00,	6.385E+00,,	2.422	
C,CS-136	,NO,	2.128E+00,	6.465E+00,	1.071E+01,,	0.199	
C,CS-137	,NO,	-1.687E-01,	3.192E+00,	5.095E+00,,	-0.033	
C,CE-139	,NO,	-3.657E-01,	2.907E+00,	4.783E+00,,	-0.076	
C,BA-140	,NO,	2.712E+00,	2.350E+01,	3.862E+01,,	0.070	
C,LA-140	,NO,	-6.006E+00,	7.844E+00,	1.209E+01,,	-0.497	
C,CE-141	,NO,	6.508E+00,	7.662E+00,	1.113E+01,,	0.585	
C,CE-144	,NO,	1.164E+01,	2.484E+01,	3.582E+01,,	0.325	
C,EU-152	,NO,	-7.804E+00,	1.104E+01,	1.471E+01,,	-0.531	
C,EU-154	,NO,	2.098E+00,	5.827E+00,	9.507E+00,,	0.221	
C,U-235	,NO,	3.551E+00,	2.649E+01,	3.720E+01,,	0.095	
C,U-238	,NO,	1.933E+02,	3.413E+02,	5.588E+02,,	0.346	
C,AM-241	,NO,	-1.931E+01,	2.549E+01,	4.165E+01,,	-0.464	

Summary of Nuclide Activity

Page : 2

Sample ID : 14L28833-7

Acquisition date : 9-JUN-2006 05:04:26

Total number of lines in spectrum	11	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	2	18.18%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	5.264E+00	5.264E+00	77.12E+00	1465.14	
TH-228	1.91Y	1.02	8.127E-01	8.254E-01	60.42E-01	732.02	
U-235	7.04E+08Y	1.00	3.197E-01	3.197E-01	46.84E-01	1465.14	K
			-----	-----			
		Total Activity :	6.396E+00	6.409E+00			

Grand Total Activity :	6.396E+00	6.409E+00
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Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Page : 3

Sample ID : 14L28833-7

Acquisition date : 9-JUN-2006 05:04:26

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.57	121	585	1.24	134.13	131	8	6.91E-03	71.6	4.59E-01	
1	139.78	191	731	2.62	280.92	274	13	1.09E-02	60.3	1.67E+00	
1	198.59	72	470	1.32	398.79	395	9	4.12E-03	****	1.60E+00	
1	295.38	143	304	1.47	592.65	588	10	8.12E-03	48.8	1.29E+00	
1	352.18	85	267	1.71	706.34	700	11	4.84E-03	86.9	1.14E+00	
1	596.01	111	98	2.16	1193.80	1189	11	6.34E-03	39.7	7.79E-01	
1	609.01	157	219	2.17	1219.77	1210	19	8.93E-03	51.6	7.66E-01	
1	1119.65	46	67	2.82	2237.45	2231	18	2.62E-03	95.0	4.81E-01	
1	1765.09	43	19	2.48	3517.89	3511	13	2.45E-03	65.5	3.44E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	11	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	2	18.18%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
RA-226	1600.00Y	1.00	5.264E+00	5.264E+00	77.12E+00	1465.14			
TH-228	1.91Y	1.02	8.127E-01	8.254E-01	60.42E-01	732.02			
Total Activity :			6.076E+00	6.089E+00					

Grand Total Activity : 6.076E+00 6.089E+00

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	5.264E+00	7.712E+01	1.233E+02	0.000E+00	0.043
TH-228	8.254E-01	6.042E+00	8.966E+00	0.000E+00	0.092

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	4.080E+00	3.158E+01	5.229E+01	0.000E+00	0.078
NA-24	-9.852E+01	5.444E+01	Half-Life too short		
K-40	-1.400E+01	4.228E+01	7.575E+01	0.000E+00	-0.185
CR-51	2.880E+00	3.824E+01	6.284E+01	0.000E+00	0.046
MN-54	-6.662E-01	3.122E+00	5.032E+00	0.000E+00	-0.132
CO-57	-7.707E-01	3.177E+00	5.244E+00	0.000E+00	-0.147
CO-58	-2.126E+00	3.325E+00	5.237E+00	0.000E+00	-0.406
FE-59	-3.750E-01	6.840E+00	1.115E+01	0.000E+00	-0.034
CO-60	-3.732E-01	3.116E+00	5.086E+00	0.000E+00	-0.073
ZN-65	1.418E+01	7.407E+00	1.196E+01	0.000E+00	1.186
SE-75	-3.504E+00	4.440E+00	7.185E+00	0.000E+00	-0.488
SR-85	2.392E+01	4.055E+00	7.814E+00	0.000E+00	3.061
Y-88	-1.366E+00	3.859E+00	6.132E+00	0.000E+00	-0.223
NB-94	-7.005E-01	2.889E+00	4.709E+00	0.000E+00	-0.149
NB-95	2.886E+00	3.592E+00	6.118E+00	0.000E+00	0.472
ZR-95	-5.329E+00	6.282E+00	9.865E+00	0.000E+00	-0.540
MO-99	9.464E+02	1.164E+03	1.989E+03	0.000E+00	0.476
RU-103	2.462E+00	3.776E+00	6.373E+00	0.000E+00	0.386
RU-106	1.497E+01	3.025E+01	4.822E+01	0.000E+00	0.311
AG-110m	-2.018E+00	3.087E+00	4.957E+00	0.000E+00	-0.407
SN-113	1.658E+00	4.417E+00	7.261E+00	0.000E+00	0.228
SB-124	7.201E+00	7.111E+00	5.871E+00	0.000E+00	1.226
SB-125	-3.578E+00	8.777E+00	1.433E+01	0.000E+00	-0.250
TE-129M	1.993E+01	4.505E+01	7.566E+01	0.000E+00	0.263
I-131	-6.065E+00	1.181E+01	1.887E+01	0.000E+00	-0.321
BA-133	1.512E+01	5.105E+00	8.002E+00	0.000E+00	1.889
CS-134	1.779E+01	6.298E+00	6.407E+00	0.000E+00	2.777
CS-136	3.041E+00	6.332E+00	1.062E+01	0.000E+00	0.286
CS-137	9.017E-01	3.262E+00	5.467E+00	0.000E+00	0.165
CE-139	-1.436E+00	3.306E+00	5.368E+00	0.000E+00	-0.267
BA-140	-4.530E+00	2.492E+01	4.045E+01	0.000E+00	-0.112
LA-140	-6.301E+00	7.871E+00	1.219E+01	0.000E+00	-0.517
CE-141	-1.009E+00	8.298E+00	1.157E+01	0.000E+00	-0.087
CE-144	-3.475E+00	2.850E+01	3.991E+01	0.000E+00	-0.087
EU-152	-6.083E+00	1.167E+01	1.566E+01	0.000E+00	-0.388
EU-154	-3.331E-01	6.438E+00	1.067E+01	0.000E+00	-0.031
AC-228	2.821E-02	1.165E+01	1.889E+01	0.000E+00	0.001
TH-232	2.806E-02	1.159E+01	1.879E+01	0.000E+00	0.001
U-235	8.790E+00	2.793E+01	3.954E+01	0.000E+00	0.222
U-238	1.097E+02	3.497E+02	5.859E+02	0.000E+00	0.187
AM-241	-7.455E+01	4.638E+01	6.630E+01	0.000E+00	-1.125

A,14L28833-7	,06/09/2006	09:57,05/24/2006	14:35,	3.261E+00,WG	L28833-7 EX
B,14L28833-7	,LIBD	,06/02/2006	08:23,	1435L091304	
C,RA-226	,YES,	5.264E+00,	7.712E+01,	1.233E+02,,	0.043
C,TH-228	,YES,	8.254E-01,	6.042E+00,	8.966E+00,,	0.092
C,BE-7	,NO,	4.080E+00,	3.158E+01,	5.229E+01,,	0.078
C,K-40	,NO,	-1.400E+01,	4.228E+01,	7.575E+01,,	-0.185
C,CR-51	,NO,	2.880E+00,	3.824E+01,	6.284E+01,,	0.046
C,MN-54	,NO,	-6.662E-01,	3.122E+00,	5.032E+00,,	-0.132
C,CO-57	,NO,	-7.707E-01,	3.177E+00,	5.244E+00,,	-0.147
C,CO-58	,NO,	-2.126E+00,	3.325E+00,	5.237E+00,,	-0.406
C,FE-59	,NO,	-3.750E-01,	6.840E+00,	1.115E+01,,	-0.034
C,CO-60	,NO,	-3.732E-01,	3.116E+00,	5.086E+00,,	-0.073
C,ZN-65	,NO,	1.418E+01,	7.407E+00,	1.196E+01,,	1.186
C,SE-75	,NO,	-3.504E+00,	4.440E+00,	7.185E+00,,	-0.488
C,SR-85	,NO,	2.392E+01,	4.055E+00,	7.814E+00,,	3.061
C,Y-88	,NO,	-1.366E+00,	3.859E+00,	6.132E+00,,	-0.223
C,NB-94	,NO,	-7.005E-01,	2.889E+00,	4.709E+00,,	-0.149
C,NB-95	,NO,	2.886E+00,	3.592E+00,	6.118E+00,,	0.472
C,ZR-95	,NO,	-5.329E+00,	6.282E+00,	9.865E+00,,	-0.540
C,MO-99	,NO,	9.464E+02,	1.164E+03,	1.989E+03,,	0.476
C,RU-103	,NO,	2.462E+00,	3.776E+00,	6.373E+00,,	0.386
C,RU-106	,NO,	1.497E+01,	3.025E+01,	4.822E+01,,	0.311
C,AG-110m	,NO,	-2.018E+00,	3.087E+00,	4.957E+00,,	-0.407
C,SN-113	,NO,	1.658E+00,	4.417E+00,	7.261E+00,,	0.228
C,SB-124	,NO,	7.201E+00,	7.111E+00,	5.871E+00,,	1.226
C,SB-125	,NO,	-3.578E+00,	8.777E+00,	1.433E+01,,	-0.250
C,TE-129M	,NO,	1.993E+01,	4.505E+01,	7.566E+01,,	0.263
C,I-131	,NO,	-6.065E+00,	1.181E+01,	1.887E+01,,	-0.321
C,BA-133	,NO,	1.512E+01,	5.105E+00,	8.002E+00,,	1.889
C,CS-134	,NO,	1.779E+01,	6.298E+00,	6.407E+00,,	2.777
C,CS-136	,NO,	3.041E+00,	6.332E+00,	1.062E+01,,	0.286
C,CS-137	,NO,	9.017E-01,	3.262E+00,	5.467E+00,,	0.165
C,CE-139	,NO,	-1.436E+00,	3.306E+00,	5.368E+00,,	-0.267
C,BA-140	,NO,	-4.530E+00,	2.492E+01,	4.045E+01,,	-0.112
C,LA-140	,NO,	-6.301E+00,	7.871E+00,	1.219E+01,,	-0.517
C,CE-141	,NO,	-1.009E+00,	8.298E+00,	1.157E+01,,	-0.087
C,CE-144	,NO,	-3.475E+00,	2.850E+01,	3.991E+01,,	-0.087
C,EU-152	,NO,	-6.083E+00,	1.167E+01,	1.566E+01,,	-0.388
C,EU-154	,NO,	-3.331E-01,	6.438E+00,	1.067E+01,,	-0.031
C,AC-228	,NO,	2.821E-02,	1.165E+01,	1.889E+01,,	0.001
C,TH-232	,NO,	2.806E-02,	1.159E+01,	1.879E+01,,	0.001
C,U-235	,NO,	8.790E+00,	2.793E+01,	3.954E+01,,	0.222
C,U-238	,NO,	1.097E+02,	3.497E+02,	5.859E+02,,	0.187
C,AM-241	,NO,	-7.455E+01,	4.638E+01,	6.630E+01,,	-1.125

Summary of Nuclide Activity
Sample ID : 15L28833-8

Page : 2
Acquisition date : 9-JUN-2006 05:04:37

Total number of lines in spectrum	5	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	0	0.00%

*** There are no nuclides meeting summary criteria ***

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines

Page : 3

Sample ID : 15L28833-8

Acquisition date : 9-JUN-2006 05:04:37

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	139.57	116	410	1.50	267.41	263	9	7.70E-03	66.0	2.70E+00	
1	198.53	86	285	1.31	385.99	382	8	5.76E-03	71.0	2.44E+00	
1	595.37	40	59	2.24	1183.79	1181	9	2.65E-03	77.0	1.01E+00	
1	608.60	81	78	1.65	1210.40	1205	10	5.39E-03	47.1	9.91E-01	
1	1763.20	30	10	2.03	3529.17	3521	13	2.00E-03	57.2	4.07E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	5
Number of unidentified lines	5
Number of lines tentatively identified by NID	0 0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	3.438E-01		2.149E+01	3.578E+01	0.000E+00	0.010
NA-24	-1.178E+01		1.715E+01	Half-Life too short		
K-40	8.573E+01		3.365E+01	6.407E+01	0.000E+00	1.338
CR-51	1.606E+00		2.614E+01	4.333E+01	0.000E+00	0.037
MN-54	-5.334E-01		2.291E+00	3.710E+00	0.000E+00	-0.144
CO-57	2.253E-02		2.050E+00	3.240E+00	0.000E+00	0.007
CO-58	-3.706E+00		2.499E+00	3.669E+00	0.000E+00	-1.010
FE-59	8.700E+00		5.627E+00	1.035E+01	0.000E+00	0.841
CO-60	-4.711E-02		2.339E+00	3.802E+00	0.000E+00	-0.012
ZN-65	6.956E+00		5.638E+00	1.010E+01	0.000E+00	0.688
SE-75	3.890E+00		2.950E+00	5.005E+00	0.000E+00	0.777
SR-85	8.482E+00		2.798E+00	5.195E+00	0.000E+00	1.633
Y-88	-5.042E-01		2.844E+00	4.614E+00	0.000E+00	-0.109
NB-94	2.428E+00		2.192E+00	3.804E+00	0.000E+00	0.638
NB-95	-8.819E-01		2.634E+00	4.269E+00	0.000E+00	-0.207
ZR-95	-1.092E+00		4.667E+00	7.622E+00	0.000E+00	-0.143
MO-99	1.056E+02		7.027E+02	1.178E+03	0.000E+00	0.090
RU-103	3.893E-01		2.719E+00	4.546E+00	0.000E+00	0.086
RU-106	1.319E+01		2.152E+01	3.649E+01	0.000E+00	0.361
AG-110m	4.374E-01		2.379E+00	3.922E+00	0.000E+00	0.112
SN-113	-8.807E-01		2.966E+00	4.781E+00	0.000E+00	-0.184
SB-124	-6.768E-01		5.981E+00	4.267E+00	0.000E+00	-0.159
SB-125	-3.507E+00		6.161E+00	9.722E+00	0.000E+00	-0.361

TE-129M	9.827E+00	3.402E+01	5.590E+01	0.000E+00	0.176
I-131	5.212E+00	7.605E+00	1.286E+01	0.000E+00	0.405
BA-133	-3.320E+00	3.094E+00	4.860E+00	0.000E+00	-0.683
CS-134	4.159E+00	3.906E+00	4.405E+00	0.000E+00	0.944
CS-136	1.923E+00	4.874E+00	8.252E+00	0.000E+00	0.233
CS-137	1.364E+00	2.571E+00	4.323E+00	0.000E+00	0.315
CE-139	6.305E-02	2.056E+00	3.403E+00	0.000E+00	0.019
BA-140	-9.985E-01	1.648E+01	2.713E+01	0.000E+00	-0.037
LA-140	-2.851E+00	5.652E+00	8.735E+00	0.000E+00	-0.326
CE-141	3.692E+00	5.060E+00	7.410E+00	0.000E+00	0.498
CE-144	2.601E-02	1.734E+01	2.478E+01	0.000E+00	0.001
EU-152	-1.492E+01	6.953E+00	1.044E+01	0.000E+00	-1.430
EU-154	9.722E-01	4.168E+00	6.630E+00	0.000E+00	0.147
RA-226	-8.261E-02	5.064E+01	8.102E+01	0.000E+00	-0.001
AC-228	1.249E+01	8.058E+00	1.469E+01	0.000E+00	0.851
TH-228	3.450E+00	4.112E+00	6.625E+00	0.000E+00	0.521
TH-232	1.243E+01	8.018E+00	1.462E+01	0.000E+00	0.851
U-235	2.114E+01	1.683E+01	2.517E+01	0.000E+00	0.840
U-238	1.372E+02	2.586E+02	4.379E+02	0.000E+00	0.313
AM-241	-1.995E+01	2.082E+01	3.351E+01	0.000E+00	-0.595

A,15L28833-8	,06/09/2006	09:34,05/25/2006	10:58,	3.044E+00,WG	L28833-8 EX
B,15L28833-8	,LIBD	,06/06/2006	10:43,	153L082604	
C,BE-7	,NO ,	3.438E-01,	2.149E+01,	3.578E+01,,	0.010
C,K-40	,NO ,	8.573E+01,	3.365E+01,	6.407E+01,,	1.338
C,CR-51	,NO ,	1.606E+00,	2.614E+01,	4.333E+01,,	0.037
C,MN-54	,NO ,	-5.334E-01,	2.291E+00,	3.710E+00,,	-0.144
C,CO-57	,NO ,	2.253E-02,	2.050E+00,	3.240E+00,,	0.007
C,CO-58	,NO ,	-3.706E+00,	2.499E+00,	3.669E+00,,	-1.010
C,FE-59	,NO ,	8.700E+00,	5.627E+00,	1.035E+01,,	0.841
C,CO-60	,NO ,	-4.711E-02,	2.339E+00,	3.802E+00,,	-0.012
C,ZN-65	,NO ,	6.956E+00,	5.638E+00,	1.010E+01,,	0.688
C,SE-75	,NO ,	3.890E+00,	2.950E+00,	5.005E+00,,	0.777
C,SR-85	,NO ,	8.482E+00,	2.798E+00,	5.195E+00,,	1.633
C,Y-88	,NO ,	-5.042E-01,	2.844E+00,	4.614E+00,,	-0.109
C,NB-94	,NO ,	2.428E+00,	2.192E+00,	3.804E+00,,	0.638
C,NB-95	,NO ,	-8.819E-01,	2.634E+00,	4.269E+00,,	-0.207
C,ZR-95	,NO ,	-1.092E+00,	4.667E+00,	7.622E+00,,	-0.143
C,MO-99	,NO ,	1.056E+02,	7.027E+02,	1.178E+03,,	0.090
C,RU-103	,NO ,	3.893E-01,	2.719E+00,	4.546E+00,,	0.086
C,RU-106	,NO ,	1.319E+01,	2.152E+01,	3.649E+01,,	0.361
C,AG-110m	,NO ,	4.374E-01,	2.379E+00,	3.922E+00,,	0.112
C,SN-113	,NO ,	-8.807E-01,	2.966E+00,	4.781E+00,,	-0.184
C,SB-124	,NO ,	-6.768E-01,	5.981E+00,	4.267E+00,,	-0.159
C,SB-125	,NO ,	-3.507E+00,	6.161E+00,	9.722E+00,,	-0.361
C,TE-129M	,NO ,	9.827E+00,	3.402E+01,	5.590E+01,,	0.176
C,I-131	,NO ,	5.212E+00,	7.605E+00,	1.286E+01,,	0.405
C,BA-133	,NO ,	-3.320E+00,	3.094E+00,	4.860E+00,,	-0.683
C,CS-134	,NO ,	4.159E+00,	3.906E+00,	4.405E+00,,	0.944
C,CS-136	,NO ,	1.923E+00,	4.874E+00,	8.252E+00,,	0.233
C,CS-137	,NO ,	1.364E+00,	2.571E+00,	4.323E+00,,	0.315
C,CE-139	,NO ,	6.305E-02,	2.056E+00,	3.403E+00,,	0.019
C,BA-140	,NO ,	-9.985E-01,	1.648E+01,	2.713E+01,,	-0.037
C,LA-140	,NO ,	-2.851E+00,	5.652E+00,	8.735E+00,,	-0.326
C,CE-141	,NO ,	3.692E+00,	5.060E+00,	7.410E+00,,	0.498
C,CE-144	,NO ,	2.601E-02,	1.734E+01,	2.478E+01,,	0.001
C,EU-152	,NO ,	-1.492E+01,	6.953E+00,	1.044E+01,,	-1.430
C,EU-154	,NO ,	9.722E-01,	4.168E+00,	6.630E+00,,	0.147
C,RA-226	,NO ,	-8.261E-02,	5.064E+01,	8.102E+01,,	-0.001
C,AC-228	,NO ,	1.249E+01,	8.058E+00,	1.469E+01,,	0.851
C,TH-228	,NO ,	3.450E+00,	4.112E+00,	6.625E+00,,	0.521
C,TH-232	,NO ,	1.243E+01,	8.018E+00,	1.462E+01,,	0.851
C,U-235	,NO ,	2.114E+01,	1.683E+01,	2.517E+01,,	0.840
C,U-238	,NO ,	1.372E+02,	2.586E+02,	4.379E+02,,	0.313
C,AM-241	,NO ,	-1.995E+01,	2.082E+01,	3.351E+01,,	-0.595

Sec. Review: *glt* Analyst: LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 09:37:59.69
 TBE23 03017322 HpGe ***** Aquisition Date/Time: 9-JUN-2006 05:04:50.80

LIMS No., Customer Name, Client ID: WG L28833-9 EXELON ZION

Sample ID : 23L28833-9 Smple Date: 25-MAY-2006 11:15:00.
 Sample Type : WG Geometry : 233L082404
 Quantity : 3.00680E+00 L BKGFILE : 23BG060306MT
 Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 04:12:16.09
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:12:05.68
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	4	33.62*	47	33	0.93	67.56	8.00E-02	3.08E-03	47.2	1.96E+00
2	4	35.24*	21	115	1.57	70.81	1.06E-01	1.42E-03	153.0	
3	0	92.29*	45	653	1.46	184.83	1.93E+00	2.95E-03	115.9	
4	0	185.47*	30	633	1.17	371.05	2.18E+00	1.97E-03	179.3	
5	0	198.20*	110	472	0.99	396.49	2.11E+00	7.25E-03	38.9	
6	0	240.43	230	571	4.43	480.89	1.89E+00	1.52E-02	23.7	
7	0	294.94*	150	332	1.03	589.85	1.64E+00	9.93E-03	26.1	
8	0	351.46*	182	280	1.07	702.82	1.44E+00	1.21E-02	20.5	
9	0	608.80*	386	127	1.25	1217.28	9.41E-01	2.55E-02	8.5	
10	0	910.72*	47	25	1.86	1820.98	7.09E-01	3.08E-03	31.2	
11	0	1119.88*	71	36	1.37	2239.28	6.16E-01	4.72E-03	22.6	
12	0	1764.29*	55	22	1.32	3528.49	4.38E-01	3.64E-03	26.2	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
RA-226	186.21	30	3.28*	2.175E+00	2.487E+01	2.487E+01	358.58
AC-228	835.50	-----	1.75	7.515E-01	-----	Line Not Found	-----
	911.07	47	27.70*	7.085E-01	1.411E+01	1.418E+01	62.37

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 23L28833-9

Acquisition date : 9-JUN-2006 05:04:50

Total number of lines in spectrum	12	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	3	25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	2.487E+01	2.487E+01	8.917E+01	358.58	
AC-228	5.75Y	1.00	1.411E+01	1.418E+01	0.884E+01	62.37	
Total Activity :			3.898E+01	3.904E+01			

Grand Total Activity : 3.898E+01 3.904E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
 Sample ID : 23L28833-9

Page : 3
 Acquisition date : 9-JUN-2006 05:04:50

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	33.62	47	33	0.93	67.56	65	17	3.08E-03	94.4	8.00E-02	
4	35.24	21	115	1.57	70.81	65	17	1.42E-03	****	1.06E-01	
0	92.29	45	653	1.46	184.83	181	9	2.95E-03	****	1.93E+00	
0	198.20	110	472	0.99	396.49	392	9	7.25E-03	77.8	2.11E+00	
0	240.43	230	571	4.43	480.89	474	15	1.52E-02	47.4	1.89E+00	T
0	294.94	150	332	1.03	589.85	585	11	9.93E-03	52.2	1.64E+00	
0	351.46	182	280	1.07	702.82	698	11	1.21E-02	41.0	1.44E+00	
0	608.80	386	127	1.25	1217.28	1211	13	2.55E-02	17.1	9.41E-01	
0	1119.88	71	36	1.37	2239.28	2234	11	4.72E-03	45.1	6.16E-01	
0	1764.29	55	22	1.32	3528.49	3522	14	3.64E-03	52.3	4.38E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	12
Number of unidentified lines	9
Number of lines tentatively identified by NID	3 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	2.487E+01	2.487E+01	8.917E+01	358.58	
AC-228	5.75Y	1.00	1.411E+01	1.418E+01	0.884E+01	62.37	
Total Activity :			3.898E+01	3.904E+01			

Grand Total Activity : 3.898E+01 3.904E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	2.487E+01	8.917E+01	1.216E+02	0.000E+00	0.205
AC-228	1.418E+01	8.843E+00	1.687E+01	0.000E+00	0.840

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
---------	---------------------------------	--------------	-----------	----------------	-----------	---------

BE-7	8.751E+00	2.875E+01	4.924E+01	0.000E+00	0.178
NA-24	-3.395E+01	1.936E+01	Half-Life too short		
K-40	-3.174E+01	4.190E+01	8.014E+01	0.000E+00	-0.396
CR-51	-2.381E+01	3.649E+01	6.077E+01	0.000E+00	-0.392
MN-54	-8.655E-01	2.929E+00	4.941E+00	0.000E+00	-0.175
CO-57	-6.784E-01	3.153E+00	5.268E+00	0.000E+00	-0.129
CO-58	-2.098E+00	3.025E+00	4.998E+00	0.000E+00	-0.420
FE-59	1.604E+00	6.096E+00	1.085E+01	0.000E+00	0.148
CO-60	3.159E+00	2.861E+00	5.375E+00	0.000E+00	0.588
ZN-65	1.804E+01	7.339E+00	1.295E+01	0.000E+00	1.394
SE-75	2.082E+00	4.282E+00	7.393E+00	0.000E+00	0.282
SR-85	1.421E+01	3.748E+00	7.073E+00	0.000E+00	2.009
Y-88	-1.295E+00	3.149E+00	5.397E+00	0.000E+00	-0.240
NB-94	1.900E+00	2.593E+00	4.635E+00	0.000E+00	0.410
NB-95	5.301E+00	3.264E+00	6.055E+00	0.000E+00	0.875
ZR-95	-3.824E+00	5.404E+00	8.948E+00	0.000E+00	-0.427
MO-99	5.920E+02	7.934E+02	1.429E+03	0.000E+00	0.414
RU-103	3.525E+00	3.689E+00	6.480E+00	0.000E+00	0.544
RU-106	4.142E+00	2.572E+01	4.485E+01	0.000E+00	0.092
AG-110m	1.973E+00	2.801E+00	5.001E+00	0.000E+00	0.395
SN-113	-1.283E+00	4.071E+00	6.824E+00	0.000E+00	-0.188
SB-124	-5.914E+00	4.129E+00	5.444E+00	0.000E+00	-1.086
SB-125	6.788E+00	8.379E+00	1.463E+01	0.000E+00	0.464
TE-129M	2.652E+01	4.341E+01	7.526E+01	0.000E+00	0.352
I-131	-5.250E+00	1.052E+01	1.755E+01	0.000E+00	-0.299
BA-133	1.080E+01	4.849E+00	7.692E+00	0.000E+00	1.404
CS-134	2.049E+01	4.305E+00	7.587E+00	0.000E+00	2.700
CS-136	-1.258E+00	5.719E+00	9.719E+00	0.000E+00	-0.129
CS-137	4.484E+00	3.065E+00	5.646E+00	0.000E+00	0.794
CE-139	-1.456E+00	3.279E+00	5.418E+00	0.000E+00	-0.269
BA-140	-1.419E+01	2.224E+01	3.642E+01	0.000E+00	-0.389
LA-140	4.241E+00	6.039E+00	1.145E+01	0.000E+00	0.370
CE-141	-5.646E+00	7.241E+00	1.192E+01	0.000E+00	-0.474
CE-144	-3.229E+01	2.476E+01	4.040E+01	0.000E+00	-0.799
EU-152	-1.894E+00	1.069E+01	1.524E+01	0.000E+00	-0.124
EU-154	2.577E+00	6.460E+00	1.092E+01	0.000E+00	0.236
TH-228	2.711E+00	7.269E+00	1.021E+01	0.000E+00	0.266
TH-232	1.411E+01	+ 8.800E+00	1.662E+01	0.000E+00	0.849
U-235	-1.593E+00	2.533E+01	4.099E+01	0.000E+00	-0.039
U-238	3.093E+01	3.288E+02	5.535E+02	0.000E+00	0.056
AM-241	-9.892E+00	1.742E+01	2.834E+01	0.000E+00	-0.349

A,23L28833-9	,06/09/2006	09:38,05/25/2006	11:15,	3.007E+00,WG	L28833-9 EX
B,23L28833-9	,LIBD		,06/01/2006	10:14,233L082404	
C,RA-226	,YES,	2.487E+01,	8.917E+01,	1.216E+02,,	0.205
C,AC-228	,YES,	1.418E+01,	8.843E+00,	1.687E+01,,	0.840
C,BE-7	,NO,	8.751E+00,	2.875E+01,	4.924E+01,,	0.178
C,K-40	,NO,	-3.174E+01,	4.190E+01,	8.014E+01,,	-0.396
C,CR-51	,NO,	-2.381E+01,	3.649E+01,	6.077E+01,,	-0.392
C,MN-54	,NO,	-8.655E-01,	2.929E+00,	4.941E+00,,	-0.175
C,CO-57	,NO,	-6.784E-01,	3.153E+00,	5.268E+00,,	-0.129
C,CO-58	,NO,	-2.098E+00,	3.025E+00,	4.998E+00,,	-0.420
C,FE-59	,NO,	1.604E+00,	6.096E+00,	1.085E+01,,	0.148
C,CO-60	,NO,	3.159E+00,	2.861E+00,	5.375E+00,,	0.588
C,ZN-65	,NO,	1.804E+01,	7.339E+00,	1.295E+01,,	1.394
C,SE-75	,NO,	2.082E+00,	4.282E+00,	7.393E+00,,	0.282
C,SR-85	,NO,	1.421E+01,	3.748E+00,	7.073E+00,,	2.009
C,Y-88	,NO,	-1.295E+00,	3.149E+00,	5.397E+00,,	-0.240
C,NB-94	,NO,	1.900E+00,	2.593E+00,	4.635E+00,,	0.410
C,NB-95	,NO,	5.301E+00,	3.264E+00,	6.055E+00,,	0.875
C,ZR-95	,NO,	-3.824E+00,	5.404E+00,	8.948E+00,,	-0.427
C,MO-99	,NO,	5.920E+02,	7.934E+02,	1.429E+03,,	0.414
C,RU-103	,NO,	3.525E+00,	3.689E+00,	6.480E+00,,	0.544
C,RU-106	,NO,	4.142E+00,	2.572E+01,	4.485E+01,,	0.092
C,AG-110m	,NO,	1.973E+00,	2.801E+00,	5.001E+00,,	0.395
C,SN-113	,NO,	-1.283E+00,	4.071E+00,	6.824E+00,,	-0.188
C,SB-124	,NO,	-5.914E+00,	4.129E+00,	5.444E+00,,	-1.086
C,SB-125	,NO,	6.788E+00,	8.379E+00,	1.463E+01,,	0.464
C,TE-129M	,NO,	2.652E+01,	4.341E+01,	7.526E+01,,	0.352
C,I-131	,NO,	-5.250E+00,	1.052E+01,	1.755E+01,,	-0.299
C,BA-133	,NO,	1.080E+01,	4.849E+00,	7.692E+00,,	1.404
C,CS-134	,NO,	2.049E+01,	4.305E+00,	7.587E+00,,	2.700
C,CS-136	,NO,	-1.258E+00,	5.719E+00,	9.719E+00,,	-0.129
C,CS-137	,NO,	4.484E+00,	3.065E+00,	5.646E+00,,	0.794
C,CE-139	,NO,	-1.456E+00,	3.279E+00,	5.418E+00,,	-0.269
C,BA-140	,NO,	-1.419E+01,	2.224E+01,	3.642E+01,,	-0.389
C,LA-140	,NO,	4.241E+00,	6.039E+00,	1.145E+01,,	0.370
C,CE-141	,NO,	-5.646E+00,	7.241E+00,	1.192E+01,,	-0.474
C,CE-144	,NO,	-3.229E+01,	2.476E+01,	4.040E+01,,	-0.799
C,EU-152	,NO,	-1.894E+00,	1.069E+01,	1.524E+01,,	-0.124
C,EU-154	,NO,	2.577E+00,	6.460E+00,	1.092E+01,,	0.236
C,TH-228	,NO,	2.711E+00,	7.269E+00,	1.021E+01,,	0.266
C,TH-232	,NO,	1.411E+01,	8.800E+00,	1.662E+01,,	0.849
C,U-235	,NO,	-1.593E+00,	2.533E+01,	4.099E+01,,	-0.039
C,U-238	,NO,	3.093E+01,	3.288E+02,	5.535E+02,,	0.056
C,AM-241	,NO,	-9.892E+00,	1.742E+01,	2.834E+01,,	-0.349

Summary of Nuclide Activity
 Sample ID : 04L28833-10

Page : 2
 Acquisition date : 9-JUN-2006 09:27:48

Total number of lines in spectrum 10
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 4 40.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	7.259E+00	7.259E+00	54.65E+00	752.85	
RA-226	1600.00Y	1.00	1.754E+01	1.754E+01	6.476E+01	369.19	
TH-228	1.91Y	1.01	1.056E+00	1.071E+00	8.139E+00	759.85	
U-235	7.04E+08Y	1.00	1.065E+00	1.065E+00	3.933E+00	369.19	K
Total Activity :			2.692E+01	2.694E+01			

Grand Total Activity : 2.692E+01 2.694E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Page : 3

Sample ID : 04L28833-10

Acquisition date : 9-JUN-2006 09:27:48

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.47	76	272	1.05	133.40	130	7	6.11E-03	79.7	6.69E-01	
1	139.98	69	312	1.25	280.41	277	9	5.50E-03	97.5	2.04E+00	
1	352.07	77	130	1.98	704.51	699	12	6.20E-03	68.6	1.28E+00	
1	583.35	23	56	1.97	1166.93	1163	9	1.85E-03	****	8.77E-01	T
1	609.39	39	82	1.24	1219.00	1214	9	3.10E-03	****	8.48E-01	
1	1240.89	32	48	0.55	2481.43	2470	16	2.60E-03	96.9	4.87E-01	
1	1764.27	14	14	2.66	3527.46	3521	11	1.13E-03	****	3.77E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	10
Number of unidentified lines	6
Number of lines tentatively identified by NID	4
	40.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr	2-Sigma Error	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	7.259E+00	7.259E+00	54.65E+00	752.85			
RA-226	1600.00Y	1.00	1.754E+01	1.754E+01	6.476E+01	369.19			
TH-228	1.91Y	1.01	1.056E+00	1.071E+00	8.139E+00	759.85			
Total Activity :			2.586E+01	2.587E+01					

Grand Total Activity : 2.586E+01 2.587E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	7.259E+00	5.465E+01	5.149E+01	0.000E+00	0.141
RA-226	1.754E+01	6.476E+01	1.089E+02	0.000E+00	0.161
TH-228	1.071E+00	8.139E+00	8.641E+00	0.000E+00	0.124

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
---------	---------------------------	-----------	-----------	-------------	-----------	---------

BE-7	5.338E+00	2.977E+01	4.968E+01	0.000E+00	0.107
NA-24	-3.215E+01	2.460E+01	Half-Life too short		
CR-51	-1.806E+01	3.493E+01	5.618E+01	0.000E+00	-0.321
MN-54	-2.094E+00	2.952E+00	4.542E+00	0.000E+00	-0.461
CO-57	2.717E-01	2.780E+00	4.667E+00	0.000E+00	0.058
CO-58	-2.840E+00	3.480E+00	5.346E+00	0.000E+00	-0.531
FE-59	8.160E+00	7.478E+00	1.328E+01	0.000E+00	0.615
CO-60	-3.920E-01	3.339E+00	5.333E+00	0.000E+00	-0.074
ZN-65	1.390E+00	6.676E+00	1.110E+01	0.000E+00	0.125
SE-75	-1.384E+00	4.050E+00	6.649E+00	0.000E+00	-0.208
SR-85	2.100E+01	4.150E+00	8.154E+00	0.000E+00	2.576
Y-88	-6.627E-01	3.370E+00	5.368E+00	0.000E+00	-0.123
NB-94	6.094E-01	2.805E+00	4.700E+00	0.000E+00	0.130
NB-95	5.277E+00	3.638E+00	6.517E+00	0.000E+00	0.810
ZR-95	-1.880E+00	6.161E+00	9.911E+00	0.000E+00	-0.190
MO-99	1.430E+02	9.674E+02	1.608E+03	0.000E+00	0.089
RU-103	1.816E+00	3.962E+00	6.688E+00	0.000E+00	0.271
RU-106	-1.039E+01	3.009E+01	4.778E+01	0.000E+00	-0.217
AG-110m	5.385E-02	3.185E+00	5.292E+00	0.000E+00	0.010
SN-113	1.753E+00	4.081E+00	6.781E+00	0.000E+00	0.258
SB-124	-9.013E+00	4.776E+00	5.474E+00	0.000E+00	-1.646
SB-125	2.002E+00	8.337E+00	1.405E+01	0.000E+00	0.143
TE-129M	6.786E+00	4.335E+01	7.244E+01	0.000E+00	0.094
I-131	9.703E+00	1.066E+01	1.816E+01	0.000E+00	0.534
BA-133	3.131E+00	4.997E+00	7.215E+00	0.000E+00	0.434
CS-134	-3.241E+00	4.368E+00	5.644E+00	0.000E+00	-0.574
CS-136	1.690E+00	6.270E+00	1.045E+01	0.000E+00	0.162
CS-137	3.152E+00	3.325E+00	5.829E+00	0.000E+00	0.541
CE-139	1.095E+00	2.864E+00	4.786E+00	0.000E+00	0.229
BA-140	-1.028E+00	2.335E+01	3.820E+01	0.000E+00	-0.027
LA-140	1.273E+00	7.631E+00	1.285E+01	0.000E+00	0.099
CE-141	3.180E+00	7.208E+00	1.045E+01	0.000E+00	0.304
CE-144	1.016E+01	2.406E+01	3.622E+01	0.000E+00	0.281
EU-152	-5.760E+00	1.154E+01	1.550E+01	0.000E+00	-0.371
EU-154	5.762E+00	5.677E+00	9.780E+00	0.000E+00	0.589
AC-228	-8.668E+00	1.231E+01	1.929E+01	0.000E+00	-0.449
TH-232	-8.625E+00	1.225E+01	1.919E+01	0.000E+00	-0.449
U-235	7.006E+00	2.426E+01	3.494E+01	0.000E+00	0.201
U-238	-1.172E+02	3.231E+02	5.162E+02	0.000E+00	-0.227
AM-241	-4.419E+01	2.932E+01	4.372E+01	0.000E+00	-1.011

A,04L28833-10	,06/09/2006	12:55,05/25/2006	14:22,	3.028E+00,WGL28833-10	EX
B,04L28833-10	,LIBD		,06/02/2006	09:04,043L082004	
C,K-40	,YES,	7.259E+00,	5.465E+01,	5.149E+01,,	0.141
C,RA-226	,YES,	1.754E+01,	6.476E+01,	1.089E+02,,	0.161
C,TH-228	,YES,	1.071E+00,	8.139E+00,	8.641E+00,,	0.124
C,BE-7	,NO,	5.338E+00,	2.977E+01,	4.968E+01,,	0.107
C,CR-51	,NO,	-1.806E+01,	3.493E+01,	5.618E+01,,	-0.321
C,MN-54	,NO,	-2.094E+00,	2.952E+00,	4.542E+00,,	-0.461
C,CO-57	,NO,	2.717E-01,	2.780E+00,	4.667E+00,,	0.058
C,CO-58	,NO,	-2.840E+00,	3.480E+00,	5.346E+00,,	-0.531
C,FE-59	,NO,	8.160E+00,	7.478E+00,	1.328E+01,,	0.615
C,CO-60	,NO,	-3.920E-01,	3.339E+00,	5.333E+00,,	-0.074
C,ZN-65	,NO,	1.390E+00,	6.676E+00,	1.110E+01,,	0.125
C,SE-75	,NO,	-1.384E+00,	4.050E+00,	6.649E+00,,	-0.208
C,SR-85	,NO,	2.100E+01,	4.150E+00,	8.154E+00,,	2.576
C,Y-88	,NO,	-6.627E-01,	3.370E+00,	5.368E+00,,	-0.123
C,NB-94	,NO,	6.094E-01,	2.805E+00,	4.700E+00,,	0.130
C,NB-95	,NO,	5.277E+00,	3.638E+00,	6.517E+00,,	0.810
C,ZR-95	,NO,	-1.880E+00,	6.161E+00,	9.911E+00,,	-0.190
C,MO-99	,NO,	1.430E+02,	9.674E+02,	1.608E+03,,	0.089
C,RU-103	,NO,	1.816E+00,	3.962E+00,	6.688E+00,,	0.271
C,RU-106	,NO,	-1.039E+01,	3.009E+01,	4.778E+01,,	-0.217
C,AG-110m	,NO,	5.385E-02,	3.185E+00,	5.292E+00,,	0.010
C,SN-113	,NO,	1.753E+00,	4.081E+00,	6.781E+00,,	0.258
C,SB-124	,NO,	-9.013E+00,	4.776E+00,	5.474E+00,,	-1.646
C,SB-125	,NO,	2.002E+00,	8.337E+00,	1.405E+01,,	0.143
C,TE-129M	,NO,	6.786E+00,	4.335E+01,	7.244E+01,,	0.094
C,I-131	,NO,	9.703E+00,	1.066E+01,	1.816E+01,,	0.534
C,BA-133	,NO,	3.131E+00,	4.997E+00,	7.215E+00,,	0.434
C,CS-134	,NO,	-3.241E+00,	4.368E+00,	5.644E+00,,	-0.574
C,CS-136	,NO,	1.690E+00,	6.270E+00,	1.045E+01,,	0.162
C,CS-137	,NO,	3.152E+00,	3.325E+00,	5.829E+00,,	0.541
C,CE-139	,NO,	1.095E+00,	2.864E+00,	4.786E+00,,	0.229
C,BA-140	,NO,	-1.028E+00,	2.335E+01,	3.820E+01,,	-0.027
C,LA-140	,NO,	1.273E+00,	7.631E+00,	1.285E+01,,	0.099
C,CE-141	,NO,	3.180E+00,	7.208E+00,	1.045E+01,,	0.304
C,CE-144	,NO,	1.016E+01,	2.406E+01,	3.622E+01,,	0.281
C,EU-152	,NO,	-5.760E+00,	1.154E+01,	1.550E+01,,	-0.371
C,EU-154	,NO,	5.762E+00,	5.677E+00,	9.780E+00,,	0.589
C,AC-228	,NO,	-8.668E+00,	1.231E+01,	1.929E+01,,	-0.449
C,TH-232	,NO,	-8.625E+00,	1.225E+01,	1.919E+01,,	-0.449
C,U-235	,NO,	7.006E+00,	2.426E+01,	3.494E+01,,	0.201
C,U-238	,NO,	-1.172E+02,	3.231E+02,	5.162E+02,,	-0.227
C,AM-241	,NO,	-4.419E+01,	2.932E+01,	4.372E+01,,	-1.011

Sec. Review: Analyst: LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 12:47:32.16
 TBE07 P-10768B HpGe ***** Aquisition Date/Time: 9-JUN-2006 09:27:51.53

LIMS No., Customer Name, Client ID: WG L28833-11 EXELON/ZION

Sample ID : 07L28833-11 Smple Date: 26-MAY-2006 09:53:00.
 Sample Type : WG Geometry : 073L082504
 Quantity : 3.00130E+00 L BKGFILE : 07BG060306MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 03:19:32.53
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:19:30.14
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.45*	85	335	1.04	133.48	8.11E-01	7.08E-03	40.6	5.34E-01
2	1	140.25*	76	284	1.27	281.19	2.36E+00	6.32E-03	43.1	1.64E+00
3	1	198.41*	98	243	1.78	397.59	2.25E+00	8.17E-03	34.2	1.69E+00
4	1	596.05	44	144	1.89	1193.28	1.10E+00	3.71E-03	60.7	1.16E+00
5	1	1461.29*	61	27	2.48	2923.57	5.83E-01	5.08E-03	30.2	5.36E-01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	61	10.67*	5.826E-01	7.365E+01	7.365E+01	60.38

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 07L28833-11

Acquisition date : 9-JUN-2006 09:27:51

Total number of lines in spectrum	5	
Number of unidentified lines	4	
Number of lines tentatively identified by NID	1	20.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	7.365E+01	7.365E+01	4.447E+01	60.38	
Total Activity :			7.365E+01	7.365E+01			

Grand Total Activity : 7.365E+01 7.365E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 07L28833-11

Page : 3
Acquisition date : 9-JUN-2006 09:27:51

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.45	85	335	1.04	133.48	131	8	7.08E-03	81.1	8.11E-01	
1	140.25	76	284	1.27	281.19	277	8	6.32E-03	86.3	2.36E+00	
1	198.41	98	243	1.78	397.59	393	10	8.17E-03	68.5	2.25E+00	
1	596.05	44	144	1.89	1193.28	1188	15	3.71E-03	****	1.10E+00	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	5
Number of unidentified lines	4
Number of lines tentatively identified by NID	1
	20.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma Error	2-Sigma	Flags
			Uncorrected	Decay Corr				
K-40	1.28E+09Y	1.00	7.365E+01	7.365E+01	4.447E+01	60.38		
Total Activity :			7.365E+01	7.365E+01				

Grand Total Activity : 7.365E+01 7.365E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	7.365E+01	4.447E+01	4.745E+01	0.000E+00	1.552

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	2.391E+01		2.694E+01	4.583E+01	0.000E+00	0.522
NA-24	-5.289E+00		8.221E+00	Half-Life too short		
CR-51	-2.746E+01		3.154E+01	5.073E+01	0.000E+00	-0.541
MN-54	-6.901E-01		2.790E+00	4.538E+00	0.000E+00	-0.152
CO-57	2.065E-02		2.775E+00	4.537E+00	0.000E+00	0.005
CO-58	-6.447E-01		3.211E+00	5.252E+00	0.000E+00	-0.123
FE-59	-1.722E+00		6.367E+00	1.034E+01	0.000E+00	-0.166

CO-60	-2.860E+00	2.757E+00	4.057E+00	0.000E+00	-0.705
ZN-65	3.236E-01	6.001E+00	9.968E+00	0.000E+00	0.032
SE-75	-1.683E+00	3.864E+00	6.206E+00	0.000E+00	-0.271
SR-85	2.531E+01	3.864E+00	7.778E+00	0.000E+00	3.254
Y-88	1.674E+00	3.029E+00	5.302E+00	0.000E+00	0.316
NB-94	2.107E+00	2.894E+00	4.907E+00	0.000E+00	0.429
NB-95	7.277E-01	3.074E+00	5.180E+00	0.000E+00	0.140
ZR-95	-1.325E+00	5.708E+00	9.133E+00	0.000E+00	-0.145
MO-99	-1.262E+02	6.841E+02	1.099E+03	0.000E+00	-0.115
RU-103	1.256E+00	3.571E+00	5.902E+00	0.000E+00	0.213
RU-106	-9.470E+00	2.725E+01	4.397E+01	0.000E+00	-0.215
AG-110m	1.101E-01	2.753E+00	4.522E+00	0.000E+00	0.024
SN-113	1.026E-01	3.693E+00	6.090E+00	0.000E+00	0.017
SB-124	-1.534E+01	4.722E+00	5.043E+00	0.000E+00	-3.042
SB-125	4.035E+00	7.904E+00	1.326E+01	0.000E+00	0.304
TE-129M	9.987E-01	4.021E+01	6.569E+01	0.000E+00	0.015
I-131	-1.547E+00	8.910E+00	1.462E+01	0.000E+00	-0.106
BA-133	4.223E+00	3.775E+00	6.528E+00	0.000E+00	0.647
CS-134	-1.129E-01	3.674E+00	5.093E+00	0.000E+00	-0.022
CS-136	-1.693E+00	5.562E+00	9.024E+00	0.000E+00	-0.188
CS-137	6.152E-01	2.948E+00	4.890E+00	0.000E+00	0.126
CE-139	-8.620E-01	2.723E+00	4.501E+00	0.000E+00	-0.191
BA-140	-5.109E-01	1.986E+01	3.292E+01	0.000E+00	-0.016
LA-140	-3.317E+00	6.676E+00	1.046E+01	0.000E+00	-0.317
CE-141	4.992E+00	7.032E+00	1.001E+01	0.000E+00	0.499
CE-144	-6.107E+00	2.459E+01	3.367E+01	0.000E+00	-0.181
EU-152	-1.603E+01	8.807E+00	1.355E+01	0.000E+00	-1.183
EU-154	-3.081E+00	5.651E+00	9.081E+00	0.000E+00	-0.339
RA-226	1.762E+00	7.093E+01	1.180E+02	0.000E+00	0.015
AC-228	7.111E+00	1.120E+01	1.892E+01	0.000E+00	0.376
TH-228	6.525E+00	5.184E+00	8.895E+00	0.000E+00	0.733
TH-232	7.078E+00	1.115E+01	1.883E+01	0.000E+00	0.376
U-235	1.246E+01	2.495E+01	3.519E+01	0.000E+00	0.354
U-238	5.128E+02	3.057E+02	5.560E+02	0.000E+00	0.922
AM-241	-2.700E+01	2.717E+01	4.012E+01	0.000E+00	-0.673

A,07L28833-11	,06/09/2006	12:47,05/26/2006	09:53,	3.001E+00,WG	L28833-11 E
B,07L28833-11	,LIBD	,06/07/2006	09:32,	073L082504	
C,K-40	,YES,	7.365E+01,	4.447E+01,	4.745E+01,,	1.552
C,BE-7	,NO,	2.391E+01,	2.694E+01,	4.583E+01,,	0.522
C,CR-51	,NO,	-2.746E+01,	3.154E+01,	5.073E+01,,	-0.541
C,MN-54	,NO,	-6.901E-01,	2.790E+00,	4.538E+00,,	-0.152
C,CO-57	,NO,	2.065E-02,	2.775E+00,	4.537E+00,,	0.005
C,CO-58	,NO,	-6.447E-01,	3.211E+00,	5.252E+00,,	-0.123
C,FE-59	,NO,	-1.722E+00,	6.367E+00,	1.034E+01,,	-0.166
C,CO-60	,NO,	-2.860E+00,	2.757E+00,	4.057E+00,,	-0.705
C,ZN-65	,NO,	3.236E-01,	6.001E+00,	9.968E+00,,	0.032
C,SE-75	,NO,	-1.683E+00,	3.864E+00,	6.206E+00,,	-0.271
C,SR-85	,NO,	2.531E+01,	3.864E+00,	7.778E+00,,	3.254
C,Y-88	,NO,	1.674E+00,	3.029E+00,	5.302E+00,,	0.316
C,NB-94	,NO,	2.107E+00,	2.894E+00,	4.907E+00,,	0.429
C,NB-95	,NO,	7.277E-01,	3.074E+00,	5.180E+00,,	0.140
C,ZR-95	,NO,	-1.325E+00,	5.708E+00,	9.133E+00,,	-0.145
C,MO-99	,NO,	-1.262E+02,	6.841E+02,	1.099E+03,,	-0.115
C,RU-103	,NO,	1.256E+00,	3.571E+00,	5.902E+00,,	0.213
C,RU-106	,NO,	-9.470E+00,	2.725E+01,	4.397E+01,,	-0.215
C,AG-110m	,NO,	1.101E-01,	2.753E+00,	4.522E+00,,	0.024
C,SN-113	,NO,	1.026E-01,	3.693E+00,	6.090E+00,,	0.017
C,SB-124	,NO,	-1.534E+01,	4.722E+00,	5.043E+00,,	-3.042
C,SB-125	,NO,	4.035E+00,	7.904E+00,	1.326E+01,,	0.304
C,TE-129M	,NO,	9.987E-01,	4.021E+01,	6.569E+01,,	0.015
C,I-131	,NO,	-1.547E+00,	8.910E+00,	1.462E+01,,	-0.106
C,BA-133	,NO,	4.223E+00,	3.775E+00,	6.528E+00,,	0.647
C,CS-134	,NO,	-1.129E-01,	3.674E+00,	5.093E+00,,	-0.022
C,CS-136	,NO,	-1.693E+00,	5.562E+00,	9.024E+00,,	-0.188
C,CS-137	,NO,	6.152E-01,	2.948E+00,	4.890E+00,,	0.126
C,CE-139	,NO,	-8.620E-01,	2.723E+00,	4.501E+00,,	-0.191
C,BA-140	,NO,	-5.109E-01,	1.986E+01,	3.292E+01,,	-0.016
C,LA-140	,NO,	-3.317E+00,	6.676E+00,	1.046E+01,,	-0.317
C,CE-141	,NO,	4.992E+00,	7.032E+00,	1.001E+01,,	0.499
C,CE-144	,NO,	-6.107E+00,	2.459E+01,	3.367E+01,,	-0.181
C,EU-152	,NO,	-1.603E+01,	8.807E+00,	1.355E+01,,	-1.183
C,EU-154	,NO,	-3.081E+00,	5.651E+00,	9.081E+00,,	-0.339
C,RA-226	,NO,	1.762E+00,	7.093E+01,	1.180E+02,,	0.015
C,AC-228	,NO,	7.111E+00,	1.120E+01,	1.892E+01,,	0.376
C,TH-228	,NO,	6.525E+00,	5.184E+00,	8.895E+00,,	0.733
C,TH-232	,NO,	7.078E+00,	1.115E+01,	1.883E+01,,	0.376
C,U-235	,NO,	1.246E+01,	2.495E+01,	3.519E+01,,	0.354
C,U-238	,NO,	5.128E+02,	3.057E+02,	5.560E+02,,	0.922
C,AM-241	,NO,	-2.700E+01,	2.717E+01,	4.012E+01,,	-0.673

Sec. Review: *JN* Analyst: LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 13:48:59.47
 TBE11 P-20610B HpGe ***** Aquisition Date/Time: 9-JUN-2006 09:30:42.78

LIMS No., Customer Name, Client ID: WG L28833-12 EXELON/ZION

Sample ID : 11L28833-12 Smple Date: 26-MAY-2006 12:30:00.
 Sample Type : WG Geometry : 113L082304
 Quantity : 3.05700E+00 L BKGFILE : 11BG060306MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:18:06.26
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:18:00.76
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	66.10	208	889	1.94	131.20	6.79E-01	1.34E-02	26.9	
2	0	139.59*	100	327	0.90	278.61	1.90E+00	6.43E-03	35.7	
3	0	185.69*	32	327	1.49	371.06	1.80E+00	2.05E-03	116.2	
4	0	198.81	144	444	0.93	397.37	1.75E+00	9.29E-03	30.6	
5	0	351.58*	56	193	2.32	703.61	1.20E+00	3.62E-03	56.5	
6	0	595.83	89	92	1.48	1192.90	8.04E-01	5.77E-03	24.2	
7	0	609.42*	14	110	1.20	1220.09	7.90E-01	9.12E-04	159.1	
8	0	912.72	65	75	6.44	1827.03	5.74E-01	4.23E-03	35.5	
9	0	1460.40*	59	12	1.61	2921.31	3.92E-01	3.83E-03	26.2	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	59	10.67*	3.920E-01	8.103E+01	8.103E+01	52.39
RA-226	186.21	32	3.28*	1.799E+00	3.071E+01	3.071E+01	232.32
U-235	143.76	-----	10.50*	1.906E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.876E+00	-----	Line Not Found	-----
	185.71	32	54.00	1.799E+00	1.865E+00	1.865E+00	232.32
	205.31	-----	4.70	1.718E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity
 Sample ID : 11L28833-12

Page : 2
 Acquisition date : 9-JUN-2006 09:30:42

Total number of lines in spectrum	9	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	2	22.22%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.103E+01	8.103E+01	4.245E+01	52.39	
RA-226	1600.00Y	1.00	3.071E+01	3.071E+01	7.134E+01	232.32	
U-235	7.04E+08Y	1.00	1.865E+00	1.865E+00	4.333E+00	232.32	K
Total Activity :			1.136E+02	1.136E+02			

Grand Total Activity : 1.136E+02 1.136E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 11L28833-12

Page : 3
Acquisition date : 9-JUN-2006 09:30:42

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.10	208	889	1.94	131.20	128	9	1.34E-02	53.7	6.79E-01	
0	139.59	100	327	0.90	278.61	275	8	6.43E-03	71.4	1.90E+00	
0	198.81	144	444	0.93	397.37	391	12	9.29E-03	61.2	1.75E+00	
0	351.58	56	193	2.32	703.61	698	12	3.62E-03	****	1.20E+00	
0	595.83	89	92	1.48	1192.90	1188	13	5.77E-03	48.4	8.04E-01	
0	609.42	14	110	1.20	1220.09	1213	10	9.12E-04	****	7.90E-01	
0	912.72	65	75	6.44	1827.03	1817	20	4.23E-03	71.0	5.74E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	9
Number of unidentified lines	7
Number of lines tentatively identified by NID	2
	22.22%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	Error	%Error	Flags
			Uncorrected	Decay Corr						
K-40	1.28E+09Y	1.00	8.103E+01	8.103E+01	4.245E+01	52.39				
RA-226	1600.00Y	1.00	3.071E+01	3.071E+01	7.134E+01	232.32				
Total Activity :			1.117E+02	1.117E+02						

Grand Total Activity : 1.117E+02 1.117E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.103E+01	4.245E+01	4.823E+01	0.000E+00	1.680
RA-226	3.071E+01	7.134E+01	1.144E+02	0.000E+00	0.268

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-5.739E+00		2.962E+01	4.789E+01	0.000E+00	-0.120
NA-24	-1.203E+00		8.495E+00	Half-Life too short		

CR-51	-1.409E+01	3.490E+01	5.690E+01	0.000E+00	-0.248
MN-54	-9.446E-01	2.846E+00	4.554E+00	0.000E+00	-0.207
CO-57	1.270E+00	3.013E+00	5.019E+00	0.000E+00	0.253
CO-58	-1.527E+00	3.352E+00	5.337E+00	0.000E+00	-0.286
FE-59	6.492E-01	6.470E+00	1.079E+01	0.000E+00	0.060
CO-60	-1.722E-01	2.859E+00	4.661E+00	0.000E+00	-0.037
ZN-65	6.905E+00	6.458E+00	1.148E+01	0.000E+00	0.601
SE-75	-3.001E+00	4.251E+00	6.915E+00	0.000E+00	-0.434
SR-85	2.117E+01	4.052E+00	7.797E+00	0.000E+00	2.715
Y-88	1.295E+00	3.547E+00	6.066E+00	0.000E+00	0.213
NB-94	-1.518E+00	2.900E+00	4.646E+00	0.000E+00	-0.327
NB-95	3.088E+00	3.168E+00	5.522E+00	0.000E+00	0.559
ZR-95	-1.698E+00	5.880E+00	9.498E+00	0.000E+00	-0.179
MO-99	-6.682E+01	7.302E+02	1.195E+03	0.000E+00	-0.056
RU-103	4.214E+00	3.838E+00	6.574E+00	0.000E+00	0.641
RU-106	9.194E+00	2.686E+01	4.537E+01	0.000E+00	0.203
AG-110m	2.330E+00	3.001E+00	5.172E+00	0.000E+00	0.450
SN-113	-7.286E-01	4.144E+00	6.760E+00	0.000E+00	-0.108
SB-124	-2.680E+00	8.279E+00	5.514E+00	0.000E+00	-0.486
SB-125	1.366E+00	8.657E+00	1.428E+01	0.000E+00	0.096
TE-129M	4.792E+00	4.277E+01	7.026E+01	0.000E+00	0.068
I-131	4.199E+00	9.769E+00	1.637E+01	0.000E+00	0.256
BA-133	4.690E+00	4.787E+00	7.055E+00	0.000E+00	0.665
CS-134	2.879E+00	6.971E+00	5.381E+00	0.000E+00	0.535
CS-136	2.607E+00	5.862E+00	9.886E+00	0.000E+00	0.264
CS-137	5.953E-01	3.190E+00	5.330E+00	0.000E+00	0.112
CE-139	-2.153E+00	3.055E+00	4.903E+00	0.000E+00	-0.439
BA-140	3.121E+00	2.160E+01	3.536E+01	0.000E+00	0.088
LA-140	-5.596E+00	7.459E+00	1.151E+01	0.000E+00	-0.486
CE-141	2.630E-01	7.478E+00	1.043E+01	0.000E+00	0.025
CE-144	2.527E+00	2.669E+01	3.740E+01	0.000E+00	0.068
EU-152	-1.072E+01	1.160E+01	1.537E+01	0.000E+00	-0.697
EU-154	1.576E+00	6.177E+00	1.024E+01	0.000E+00	0.154
AC-228	-2.608E+00	1.504E+01	2.007E+01	0.000E+00	-0.130
TH-228	8.145E+00	6.160E+00	9.946E+00	0.000E+00	0.819
TH-232	-2.596E+00	1.497E+01	1.997E+01	0.000E+00	-0.130
U-235	1.814E+01	2.582E+01	3.696E+01	0.000E+00	0.491
U-238	-2.199E+02	3.184E+02	5.032E+02	0.000E+00	-0.437
AM-241	1.311E+01	4.562E+01	6.308E+01	0.000E+00	0.208

A,11L28833-12	,06/09/2006	13:49,05/26/2006	12:30,	3.057E+00,WG	L28833-12 E
B,11L28833-12	,LIBD		,06/07/2006	09:40,113L082304	
C,K-40	,YES,	8.103E+01,	4.245E+01,	4.823E+01,,	1.680
C,RA-226	,YES,	3.071E+01,	7.134E+01,	1.144E+02,,	0.268
C,BE-7	,NO,	-5.739E+00,	2.962E+01,	4.789E+01,,	-0.120
C,CR-51	,NO,	-1.409E+01,	3.490E+01,	5.690E+01,,	-0.248
C,MN-54	,NO,	-9.446E-01,	2.846E+00,	4.554E+00,,	-0.207
C,CO-57	,NO,	1.270E+00,	3.013E+00,	5.019E+00,,	0.253
C,CO-58	,NO,	-1.527E+00,	3.352E+00,	5.337E+00,,	-0.286
C,FE-59	,NO,	6.492E-01,	6.470E+00,	1.079E+01,,	0.060
C,CO-60	,NO,	-1.722E-01,	2.859E+00,	4.661E+00,,	-0.037
C,ZN-65	,NO,	6.905E+00,	6.458E+00,	1.148E+01,,	0.601
C,SE-75	,NO,	-3.001E+00,	4.251E+00,	6.915E+00,,	-0.434
C,SR-85	,NO,	2.117E+01,	4.052E+00,	7.797E+00,,	2.715
C,Y-88	,NO,	1.295E+00,	3.547E+00,	6.066E+00,,	0.213
C,NB-94	,NO,	-1.518E+00,	2.900E+00,	4.646E+00,,	-0.327
C,NB-95	,NO,	3.088E+00,	3.168E+00,	5.522E+00,,	0.559
C,ZR-95	,NO,	-1.698E+00,	5.880E+00,	9.498E+00,,	-0.179
C,MO-99	,NO,	-6.682E+01,	7.302E+02,	1.195E+03,,	-0.056
C,RU-103	,NO,	4.214E+00,	3.838E+00,	6.574E+00,,	0.641
C,RU-106	,NO,	9.194E+00,	2.686E+01,	4.537E+01,,	0.203
C,AG-110m	,NO,	2.330E+00,	3.001E+00,	5.172E+00,,	0.450
C,SN-113	,NO,	-7.286E-01,	4.144E+00,	6.760E+00,,	-0.108
C,SB-124	,NO,	-2.680E+00,	8.279E+00,	5.514E+00,,	-0.486
C,SB-125	,NO,	1.366E+00,	8.657E+00,	1.428E+01,,	0.096
C,TE-129M	,NO,	4.792E+00,	4.277E+01,	7.026E+01,,	0.068
C,I-131	,NO,	4.199E+00,	9.769E+00,	1.637E+01,,	0.256
C,BA-133	,NO,	4.690E+00,	4.787E+00,	7.055E+00,,	0.665
C,CS-134	,NO,	2.879E+00,	6.971E+00,	5.381E+00,,	0.535
C,CS-136	,NO,	2.607E+00,	5.862E+00,	9.886E+00,,	0.264
C,CS-137	,NO,	5.953E-01,	3.190E+00,	5.330E+00,,	0.112
C,CE-139	,NO,	-2.153E+00,	3.055E+00,	4.903E+00,,	-0.439
C,BA-140	,NO,	3.121E+00,	2.160E+01,	3.536E+01,,	0.088
C,LA-140	,NO,	-5.596E+00,	7.459E+00,	1.151E+01,,	-0.486
C,CE-141	,NO,	2.630E-01,	7.478E+00,	1.043E+01,,	0.025
C,CE-144	,NO,	2.527E+00,	2.669E+01,	3.740E+01,,	0.068
C,EU-152	,NO,	-1.072E+01,	1.160E+01,	1.537E+01,,	-0.697
C,EU-154	,NO,	1.576E+00,	6.177E+00,	1.024E+01,,	0.154
C,AC-228	,NO,	-2.608E+00,	1.504E+01,	2.007E+01,,	-0.130
C,TH-228	,NO,	8.145E+00,	6.160E+00,	9.946E+00,,	0.819
C,TH-232	,NO,	-2.596E+00,	1.497E+01,	1.997E+01,,	-0.130
C,U-235	,NO,	1.814E+01,	2.582E+01,	3.696E+01,,	0.491
C,U-238	,NO,	-2.199E+02,	3.184E+02,	5.032E+02,,	-0.437
C,AM-241	,NO,	1.311E+01,	4.562E+01,	6.308E+01,,	0.208

Summary of Nuclide Activity
 Sample ID : 13L28833-13

Acquisition date : 9-JUN-2006 09:47:29

Total number of lines in spectrum 15
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 2 13.33%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	1.873E+01	1.873E+01	7.582E+01	404.80	
U-235	7.04E+08Y	1.00	2.147E+01	2.147E+01	1.933E+01	90.06	
Total Activity :			4.020E+01	4.020E+01			

Grand Total Activity : 4.020E+01 4.020E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 13L28833-13

Page : 3
Acquisition date : 9-JUN-2006 09:47:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	45.32	105	223	1.54	90.78	87	13	9.16E-03	52.1	1.34E-01	
6	46.47	56	267	1.44	93.06	87	13	4.89E-03	****	1.58E-01	
1	65.22	139	719	3.53	130.55	123	14	1.21E-02	84.3	7.84E-01	
1	92.94	49	490	1.72	185.94	179	12	4.26E-03	****	1.74E+00	
1	139.86	90	300	1.61	279.73	276	8	7.81E-03	74.8	2.27E+00	
1	198.42	50	281	1.10	396.78	392	9	4.39E-03	****	2.12E+00	
1	294.83	20	179	1.66	589.53	585	9	1.76E-03	****	1.70E+00	
1	351.73	29	149	1.19	703.31	699	9	2.50E-03	****	1.51E+00	
1	595.98	71	76	1.65	1191.83	1184	12	6.16E-03	54.6	1.02E+00	
1	609.26	37	111	1.45	1218.39	1213	14	3.21E-03	****	1.01E+00	
1	912.49	19	46	3.86	1825.17	1819	14	1.66E-03	****	7.35E-01	
1	1764.44	11	24	3.33	3531.69	3527	12	9.57E-04	****	4.55E-01	
1	1858.05	13	7	1.67	3719.35	3715	9	1.16E-03	86.1	4.42E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	15
Number of unidentified lines	13
Number of lines tentatively identified by NID	2 13.33%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
U-235	7.04E+08Y	1.00	2.229E+00	2.229E+00	4.480E+00	200.97	
Total Activity :			2.229E+00	2.229E+00			

Grand Total Activity : 2.229E+00 2.229E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
U-235	185.71	RA-226	186.21

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
U-235	2.229E+00	4.480E+00	4.044E+01	0.000E+00	0.055

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.170E+01		3.072E+01	4.967E+01	0.000E+00	-0.236
NA-24	-1.177E+01		9.457E+00	Half-Life too short		
K-40	6.527E+00		4.764E+01	8.936E+01	0.000E+00	0.073
CR-51	-2.134E-01		3.640E+01	5.979E+01	0.000E+00	-0.004
MN-54	-8.724E-02		3.421E+00	5.673E+00	0.000E+00	-0.015
CO-57	-2.539E+00		3.143E+00	4.963E+00	0.000E+00	-0.512
CO-58	-1.345E+00		3.368E+00	5.330E+00	0.000E+00	-0.252
FE-59	4.248E+00		7.573E+00	1.305E+01	0.000E+00	0.326
CO-60	3.653E+00		3.574E+00	6.316E+00	0.000E+00	0.578
ZN-65	2.541E+00		7.228E+00	1.227E+01	0.000E+00	0.207
SE-75	-1.866E+00		4.547E+00	7.448E+00	0.000E+00	-0.251
SR-85	2.492E+01		4.356E+00	8.529E+00	0.000E+00	2.921
Y-88	-1.440E+00		3.796E+00	6.028E+00	0.000E+00	-0.239
NB-94	2.759E+00		3.165E+00	5.449E+00	0.000E+00	0.506
NB-95	3.515E+00		3.440E+00	5.983E+00	0.000E+00	0.588
ZR-95	-4.174E+00		6.282E+00	9.840E+00	0.000E+00	-0.424
MO-99	3.025E+02		8.078E+02	1.354E+03	0.000E+00	0.223
RU-103	4.902E-01		3.962E+00	6.549E+00	0.000E+00	0.075
RU-106	1.758E+00		3.120E+01	4.854E+01	0.000E+00	0.036
AG-110m	7.522E-01		3.323E+00	5.557E+00	0.000E+00	0.135
SN-113	-7.701E-02		4.574E+00	7.423E+00	0.000E+00	-0.010
SB-124	8.011E-01		8.457E+00	5.915E+00	0.000E+00	0.135
SB-125	-4.107E+00		9.070E+00	1.474E+01	0.000E+00	-0.279
TE-129M	-5.604E+01		4.452E+01	6.891E+01	0.000E+00	-0.813
I-131	-9.078E-02		1.082E+01	1.763E+01	0.000E+00	-0.005
BA-133	5.831E+00		5.156E+00	7.591E+00	0.000E+00	0.768
CS-134	3.583E+00		6.162E+00	6.161E+00	0.000E+00	0.582
CS-136	-4.968E+00		6.133E+00	9.397E+00	0.000E+00	-0.529
CS-137	7.409E-01		3.644E+00	5.947E+00	0.000E+00	0.125
CE-139	4.468E+00		3.150E+00	5.409E+00	0.000E+00	0.826
BA-140	1.048E+01		2.294E+01	3.842E+01	0.000E+00	0.273
LA-140	-2.504E+00		7.728E+00	1.230E+01	0.000E+00	-0.204
CE-141	5.780E+00		8.122E+00	1.180E+01	0.000E+00	0.490
CE-144	-2.552E+00		2.781E+01	3.934E+01	0.000E+00	-0.065
EU-152	-6.701E+00		1.243E+01	1.663E+01	0.000E+00	-0.403
EU-154	-6.816E+00		6.335E+00	9.913E+00	0.000E+00	-0.688
RA-226	1.873E+01		7.582E+01	1.380E+02	0.000E+00	0.136
AC-228	-2.769E+00		1.315E+01	2.099E+01	0.000E+00	-0.132
TH-228	4.266E+00		6.471E+00	1.069E+01	0.000E+00	0.399
TH-232	-2.757E+00		1.309E+01	2.089E+01	0.000E+00	-0.132
U-238	1.774E+02		3.776E+02	6.237E+02	0.000E+00	0.285
AM-241	4.589E+01		3.024E+01	4.573E+01	0.000E+00	1.004

A,13L28833-13	,06/09/2006	12:59,	05/26/2006	11:02,	3.003E+00,WG	L28833-13 E
B,13L28833-13	,LIBD		,06/07/2006	09:34,	133L082404	
C,U-235	,YES,	2.229E+00,	4.480E+00,	4.044E+01,,	0.055	
C,BE-7	,NO ,	-1.170E+01,	3.072E+01,	4.967E+01,,	-0.236	
C,K-40	,NO ,	6.527E+00,	4.764E+01,	8.936E+01,,	0.073	
C,CR-51	,NO ,	-2.134E-01,	3.640E+01,	5.979E+01,,	-0.004	
C,MN-54	,NO ,	-8.724E-02,	3.421E+00,	5.673E+00,,	-0.015	
C,CO-57	,NO ,	-2.539E+00,	3.143E+00,	4.963E+00,,	-0.512	
C,CO-58	,NO ,	-1.345E+00,	3.368E+00,	5.330E+00,,	-0.252	
C,FE-59	,NO ,	4.248E+00,	7.573E+00,	1.305E+01,,	0.326	
C,CO-60	,NO ,	3.653E+00,	3.574E+00,	6.316E+00,,	0.578	
C,ZN-65	,NO ,	2.541E+00,	7.228E+00,	1.227E+01,,	0.207	
C,SE-75	,NO ,	-1.866E+00,	4.547E+00,	7.448E+00,,	-0.251	
C,SR-85	,NO ,	2.492E+01,	4.356E+00,	8.529E+00,,	2.921	
C,Y-88	,NO ,	-1.440E+00,	3.796E+00,	6.028E+00,,	-0.239	
C,NB-94	,NO ,	2.759E+00,	3.165E+00,	5.449E+00,,	0.506	
C,NB-95	,NO ,	3.515E+00,	3.440E+00,	5.983E+00,,	0.588	
C,ZR-95	,NO ,	-4.174E+00,	6.282E+00,	9.840E+00,,	-0.424	
C,MO-99	,NO ,	3.025E+02,	8.078E+02,	1.354E+03,,	0.223	
C,RU-103	,NO ,	4.902E-01,	3.962E+00,	6.549E+00,,	0.075	
C,RU-106	,NO ,	1.758E+00,	3.120E+01,	4.854E+01,,	0.036	
C,AG-110m	,NO ,	7.522E-01,	3.323E+00,	5.557E+00,,	0.135	
C,SN-113	,NO ,	-7.701E-02,	4.574E+00,	7.423E+00,,	-0.010	
C,SB-124	,NO ,	8.011E-01,	8.457E+00,	5.915E+00,,	0.135	
C,SB-125	,NO ,	-4.107E+00,	9.070E+00,	1.474E+01,,	-0.279	
C,TE-129M	,NO ,	-5.604E+01,	4.452E+01,	6.891E+01,,	-0.813	
C,I-131	,NO ,	-9.078E-02,	1.082E+01,	1.763E+01,,	-0.005	
C,BA-133	,NO ,	5.831E+00,	5.156E+00,	7.591E+00,,	0.768	
C,CS-134	,NO ,	3.583E+00,	6.162E+00,	6.161E+00,,	0.582	
C,CS-136	,NO ,	-4.968E+00,	6.133E+00,	9.397E+00,,	-0.529	
C,CS-137	,NO ,	7.409E-01,	3.644E+00,	5.947E+00,,	0.125	
C,CE-139	,NO ,	4.468E+00,	3.150E+00,	5.409E+00,,	0.826	
C,BA-140	,NO ,	1.048E+01,	2.294E+01,	3.842E+01,,	0.273	
C,LA-140	,NO ,	-2.504E+00,	7.728E+00,	1.230E+01,,	-0.204	
C,CE-141	,NO ,	5.780E+00,	8.122E+00,	1.180E+01,,	0.490	
C,CE-144	,NO ,	-2.552E+00,	2.781E+01,	3.934E+01,,	-0.065	
C,EU-152	,NO ,	-6.701E+00,	1.243E+01,	1.663E+01,,	-0.403	
C,EU-154	,NO ,	-6.816E+00,	6.335E+00,	9.913E+00,,	-0.688	
C,RA-226	,NO ,	1.873E+01,	7.582E+01,	1.380E+02,,	0.136	
C,AC-228	,NO ,	-2.769E+00,	1.315E+01,	2.099E+01,,	-0.132	
C,TH-228	,NO ,	4.266E+00,	6.471E+00,	1.069E+01,,	0.399	
C,TH-232	,NO ,	-2.757E+00,	1.309E+01,	2.089E+01,,	-0.132	
C,U-238	,NO ,	1.774E+02,	3.776E+02,	6.237E+02,,	0.285	
C,AM-241	,NO ,	4.589E+01,	3.024E+01,	4.573E+01,,	1.004	

Summary of Nuclide Activity
 Sample ID : 07L28833-14

Page : 2
 Acquisition date : 9-JUN-2006 05:03:38

Total number of lines in spectrum	10	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	3	30.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	5.304E+01	5.304E+01	3.420E+01	64.48	
AC-228	5.75Y	1.00	3.507E+01	3.523E+01	1.030E+01	29.23	
TH-228	1.91Y	1.01	6.528E+00	6.617E+00	4.976E+00	75.19	
			-----	-----			
		Total Activity :	9.464E+01	9.489E+01			

Grand Total Activity : 9.464E+01 9.489E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
 Sample ID : 07L28833-14

Acquisition date : 9-JUN-2006 05:03:38

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.15	116	427	1.49	132.87	130	8	8.03E-03	68.0	7.99E-01	
1	295.40	109	237	1.81	591.70	587	11	7.60E-03	61.7	1.81E+00	
1	351.81	104	209	1.08	704.59	699	11	7.22E-03	64.1	1.61E+00	
1	595.72	91	115	2.64	1192.61	1188	15	6.33E-03	55.4	1.10E+00	
1	609.23	147	141	1.44	1219.63	1214	13	1.02E-02	40.2	1.09E+00	
2	1464.01	37	10	2.11	2929.00	2915	21	2.54E-03	77.1	5.82E-01	
1	1765.16	34	22	2.98	3530.90	3523	15	2.39E-03	80.2	5.12E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 10
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 3 30.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	5.304E+01	5.304E+01	3.420E+01	64.48	
AC-228	5.75Y	1.00	3.507E+01	3.523E+01	1.030E+01	29.23	
TH-228	1.91Y	1.01	6.528E+00	6.617E+00	4.976E+00	75.19	
Total Activity :			9.464E+01	9.489E+01			

Grand Total Activity : 9.464E+01 9.489E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	5.304E+01	3.420E+01	3.751E+01	0.000E+00	1.414
AC-228	3.523E+01	1.030E+01	1.451E+01	0.000E+00	2.428
TH-228	6.617E+00	4.976E+00	7.245E+00	0.000E+00	0.913

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	2.542E+01	2.465E+01	4.202E+01	0.000E+00	0.605
NA-24	-2.699E+00	5.797E+00	Half-Life	too short	
CR-51	-2.000E+01	2.851E+01	4.630E+01	0.000E+00	-0.432
MN-54	1.376E+00	2.499E+00	4.259E+00	0.000E+00	0.323
CO-57	-1.725E-01	2.543E+00	4.149E+00	0.000E+00	-0.042
CO-58	-2.574E+00	2.839E+00	4.459E+00	0.000E+00	-0.577
FE-59	8.619E+00	5.771E+00	1.043E+01	0.000E+00	0.826
CO-60	1.856E+00	2.437E+00	4.229E+00	0.000E+00	0.439
ZN-65	6.078E+00	5.582E+00	9.850E+00	0.000E+00	0.617
SE-75	4.361E-01	3.549E+00	5.818E+00	0.000E+00	0.075
SR-85	2.046E+01	3.377E+00	6.658E+00	0.000E+00	3.074
Y-88	1.855E-01	2.804E+00	4.672E+00	0.000E+00	0.040
NB-94	-8.191E-01	2.495E+00	4.002E+00	0.000E+00	-0.205
NB-95	1.535E+00	2.715E+00	4.650E+00	0.000E+00	0.330
ZR-95	-1.902E+00	4.926E+00	7.813E+00	0.000E+00	-0.243
MO-99	1.638E+02	5.824E+02	9.626E+02	0.000E+00	0.170
RU-103	1.380E+00	3.271E+00	5.413E+00	0.000E+00	0.255
RU-106	-3.303E+00	2.531E+01	4.024E+01	0.000E+00	-0.082
AG-110m	-9.994E-01	2.480E+00	3.975E+00	0.000E+00	-0.251
SN-113	1.146E+00	3.403E+00	5.681E+00	0.000E+00	0.202
SB-124	-1.588E+00	6.582E+00	4.401E+00	0.000E+00	-0.361
SB-125	6.533E-02	7.205E+00	1.181E+01	0.000E+00	0.006
TE-129M	2.160E+01	3.693E+01	6.182E+01	0.000E+00	0.349
I-131	-2.620E+00	7.944E+00	1.296E+01	0.000E+00	-0.202
BA-133	9.456E+00	4.157E+00	6.514E+00	0.000E+00	1.452
CS-134	7.772E+00	5.911E+00	5.130E+00	0.000E+00	1.515
CS-136	-2.253E+00	4.807E+00	7.730E+00	0.000E+00	-0.291
CS-137	1.850E+00	2.599E+00	4.424E+00	0.000E+00	0.418
CE-139	-1.321E+00	2.547E+00	4.191E+00	0.000E+00	-0.315
BA-140	-7.654E+00	1.762E+01	2.863E+01	0.000E+00	-0.267
LA-140	4.997E+00	5.741E+00	1.012E+01	0.000E+00	0.494
CE-141	-9.192E+00	5.569E+00	8.619E+00	0.000E+00	-1.066
CE-144	-2.681E+01	2.012E+01	3.160E+01	0.000E+00	-0.849
EU-152	-5.574E+00	9.466E+00	1.288E+01	0.000E+00	-0.433
EU-154	-9.050E-01	5.205E+00	8.464E+00	0.000E+00	-0.107
RA-226	-3.224E+01	6.366E+01	1.037E+02	0.000E+00	-0.311
TH-232	3.507E+01	1.025E+01	1.606E+01	0.000E+00	2.183
U-235	-1.984E+01	1.916E+01	3.021E+01	0.000E+00	-0.657
U-238	2.516E+02	2.883E+02	4.958E+02	0.000E+00	0.508
AM-241	-4.279E+01	2.559E+01	3.572E+01	0.000E+00	-1.198

A,07L28833-14	,06/09/2006	09:53,	05/26/2006	13:40,	3.024E+00,WG	L28833-14	E
B,07L28833-14	,LIBD		,06/07/2006	09:32,	073L082504		
C,K-40	,YES,	5.304E+01,	3.420E+01,	3.751E+01,,	1.414		
C,AC-228	,YES,	3.523E+01,	1.030E+01,	1.451E+01,,	2.428		
C,TH-228	,YES,	6.617E+00,	4.976E+00,	7.245E+00,,	0.913		
C,BE-7	,NO ,	2.542E+01,	2.465E+01,	4.202E+01,,	0.605		
C,CR-51	,NO ,	-2.000E+01,	2.851E+01,	4.630E+01,,	-0.432		
C,MN-54	,NO ,	1.376E+00,	2.499E+00,	4.259E+00,,	0.323		
C,CO-57	,NO ,	-1.725E-01,	2.543E+00,	4.149E+00,,	-0.042		
C,CO-58	,NO ,	-2.574E+00,	2.839E+00,	4.459E+00,,	-0.577		
C,FE-59	,NO ,	8.619E+00,	5.771E+00,	1.043E+01,,	0.826		
C,CO-60	,NO ,	1.856E+00,	2.437E+00,	4.229E+00,,	0.439		
C,ZN-65	,NO ,	6.078E+00,	5.582E+00,	9.850E+00,,	0.617		
C,SE-75	,NO ,	4.361E-01,	3.549E+00,	5.818E+00,,	0.075		
C,SR-85	,NO ,	2.046E+01,	3.377E+00,	6.658E+00,,	3.074		
C,Y-88	,NO ,	1.855E-01,	2.804E+00,	4.672E+00,,	0.040		
C,NB-94	,NO ,	-8.191E-01,	2.495E+00,	4.002E+00,,	-0.205		
C,NB-95	,NO ,	1.535E+00,	2.715E+00,	4.650E+00,,	0.330		
C,ZR-95	,NO ,	-1.902E+00,	4.926E+00,	7.813E+00,,	-0.243		
C,MO-99	,NO ,	1.638E+02,	5.824E+02,	9.626E+02,,	0.170		
C,RU-103	,NO ,	1.380E+00,	3.271E+00,	5.413E+00,,	0.255		
C,RU-106	,NO ,	-3.303E+00,	2.531E+01,	4.024E+01,,	-0.082		
C,AG-110m	,NO ,	-9.994E-01,	2.480E+00,	3.975E+00,,	-0.251		
C,SN-113	,NO ,	1.146E+00,	3.403E+00,	5.681E+00,,	0.202		
C,SB-124	,NO ,	-1.588E+00,	6.582E+00,	4.401E+00,,	-0.361		
C,SB-125	,NO ,	6.533E-02,	7.205E+00,	1.181E+01,,	0.006		
C,TE-129M	,NO ,	2.160E+01,	3.693E+01,	6.182E+01,,	0.349		
C,I-131	,NO ,	-2.620E+00,	7.944E+00,	1.296E+01,,	-0.202		
C,BA-133	,NO ,	9.456E+00,	4.157E+00,	6.514E+00,,	1.452		
C,CS-134	,NO ,	7.772E+00,	5.911E+00,	5.130E+00,,	1.515		
C,CS-136	,NO ,	-2.253E+00,	4.807E+00,	7.730E+00,,	-0.291		
C,CS-137	,NO ,	1.850E+00,	2.599E+00,	4.424E+00,,	0.418		
C,CE-139	,NO ,	-1.321E+00,	2.547E+00,	4.191E+00,,	-0.315		
C,BA-140	,NO ,	-7.654E+00,	1.762E+01,	2.863E+01,,	-0.267		
C,LA-140	,NO ,	4.997E+00,	5.741E+00,	1.012E+01,,	0.494		
C,CE-141	,NO ,	-9.192E+00,	5.569E+00,	8.619E+00,,	-1.066		
C,CE-144	,NO ,	-2.681E+01,	2.012E+01,	3.160E+01,,	-0.849		
C,EU-152	,NO ,	-5.574E+00,	9.466E+00,	1.288E+01,,	-0.433		
C,EU-154	,NO ,	-9.050E-01,	5.205E+00,	8.464E+00,,	-0.107		
C,RA-226	,NO ,	-3.224E+01,	6.366E+01,	1.037E+02,,	-0.311		
C,TH-232	,NO ,	3.507E+01,	1.025E+01,	1.606E+01,,	2.183		
C,U-235	,NO ,	-1.984E+01,	1.916E+01,	3.021E+01,,	-0.657		
C,U-238	,NO ,	2.516E+02,	2.883E+02,	4.958E+02,,	0.508		
C,AM-241	,NO ,	-4.279E+01,	2.559E+01,	3.572E+01,,	-1.198		

Sec. Review: Analyst: *M* LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 13:50:50.63
 TBE15 P-10635B HpGe ***** Aquisition Date/Time: 9-JUN-2006 09:47:32.21

LIMS No., Customer Name, Client ID: WG L28833-15 EXELON/ZION

Sample ID : 15L28833-15 Smple Date: 26-MAY-2006 14:48:00.
 Sample Type : WG Geometry : 153L082604
 Quantity : 3.04520E+00 L BKGFILE : 15BG060306MT
 Start Channel : 40 Energy Tol : 1.50000 Real Time : 0 04:03:13.90
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:03:12.45
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.30	67	331	0.88	120.06	8.71E-01	4.59E-03	44.4	8.35E-01
2	1	139.61	38	354	1.13	267.51	2.70E+00	2.59E-03	88.4	3.00E+00
3	1	595.31	57	44	1.92	1183.68	1.01E+00	3.93E-03	23.8	2.61E+00
4	1	608.50	83	90	2.12	1210.20	9.91E-01	5.68E-03	26.3	2.22E+00
5	1	1126.55	557	67	14.23	2251.03	5.83E-01	3.82E-02	5.0	7.70E+01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : 15L28833-15

Acquisition date : 9-JUN-2006 09:47:32

Total number of lines in spectrum	5	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	0	0.00%

*** There are no nuclides meeting summary criteria ***

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 15L28833-15

Acquisition date : 9-JUN-2006 09:47:32

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.30	67	331	0.88	120.06	118	6	4.59E-03	88.7	8.71E-01	
1	139.61	38	354	1.13	267.51	264	8	2.59E-03	****	2.70E+00	
1	595.31	57	44	1.92	1183.68	1180	8	3.93E-03	47.6	1.01E+00	
1	608.50	83	90	2.12	1210.20	1206	13	5.68E-03	52.6	9.91E-01	
1	1126.55	557	67	14.23	2251.03	2229	36	3.82E-02	10.0	5.83E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 5
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 0 0.00%
 **** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.963E+01		2.125E+01	3.699E+01	0.000E+00	0.531
NA-24	-5.409E+00		5.914E+00	Half-Life too short		
K-40	8.149E+01		3.446E+01	6.511E+01	0.000E+00	1.252
CR-51	-2.984E-01		2.395E+01	3.959E+01	0.000E+00	-0.008
MN-54	7.464E-01		2.347E+00	3.951E+00	0.000E+00	0.189
CO-57	1.155E+00		2.002E+00	3.218E+00	0.000E+00	0.359
CO-58	-2.428E+00		2.650E+00	4.093E+00	0.000E+00	-0.593
FE-59	-7.202E-01		5.381E+00	8.799E+00	0.000E+00	-0.082
CO-60	1.056E+00		2.252E+00	3.856E+00	0.000E+00	0.274
ZN-65	-3.149E+00		6.673E+00	8.755E+00	0.000E+00	-0.360
SE-75	2.006E+00		3.093E+00	5.119E+00	0.000E+00	0.392
SR-85	6.715E+00		2.892E+00	5.232E+00	0.000E+00	1.283
Y-88	1.717E+00		3.011E+00	5.288E+00	0.000E+00	0.325
NB-94	2.143E+00		2.174E+00	3.754E+00	0.000E+00	0.571
NB-95	5.259E-01		2.596E+00	4.357E+00	0.000E+00	0.121
ZR-95	-4.538E+00		4.576E+00	7.075E+00	0.000E+00	-0.641
MO-99	-2.262E+02		5.204E+02	8.377E+02	0.000E+00	-0.270
RU-103	-1.999E+00		2.754E+00	4.396E+00	0.000E+00	-0.455
RU-106	7.905E+00		2.116E+01	3.543E+01	0.000E+00	0.223
AG-110m	-5.229E-01		2.426E+00	3.902E+00	0.000E+00	-0.134
SN-113	1.968E+00		3.095E+00	5.208E+00	0.000E+00	0.378
SB-124	-4.662E-01		5.921E+00	4.255E+00	0.000E+00	-0.110
SB-125	4.513E+00		6.415E+00	1.080E+01	0.000E+00	0.418

TE-129M	6.830E+00	3.220E+01	5.274E+01	0.000E+00	0.130
I-131	3.420E-01	6.967E+00	1.147E+01	0.000E+00	0.030
BA-133	-1.531E+00	2.993E+00	4.810E+00	0.000E+00	-0.318
CS-134	3.019E+00	3.372E+00	4.283E+00	0.000E+00	0.705
CS-136	4.536E-01	4.683E+00	7.775E+00	0.000E+00	0.058
CS-137	1.452E+00	2.537E+00	4.282E+00	0.000E+00	0.339
CE-139	2.148E-01	2.017E+00	3.345E+00	0.000E+00	0.064
BA-140	8.093E+00	1.607E+01	2.730E+01	0.000E+00	0.296
LA-140	-2.859E+00	5.641E+00	8.729E+00	0.000E+00	-0.328
CE-141	4.774E+00	4.896E+00	7.249E+00	0.000E+00	0.659
CE-144	-1.826E+00	1.658E+01	2.359E+01	0.000E+00	-0.077
EU-152	-6.020E+00	7.021E+00	1.116E+01	0.000E+00	-0.539
EU-154	2.998E+00	4.124E+00	6.660E+00	0.000E+00	0.450
RA-226	-4.404E+01	5.200E+01	8.129E+01	0.000E+00	-0.542
AC-228	1.375E+01	8.776E+00	1.592E+01	0.000E+00	0.863
TH-228	1.633E-01	4.132E+00	6.491E+00	0.000E+00	0.025
TH-232	1.368E+01	8.736E+00	1.585E+01	0.000E+00	0.863
U-235	1.199E+01	1.715E+01	2.511E+01	0.000E+00	0.477
U-238	2.614E+01	2.549E+02	4.179E+02	0.000E+00	0.063
AM-241	-3.729E+01	2.197E+01	3.374E+01	0.000E+00	-1.105

A,15L28833-15	,06/09/2006	13:50,05/26/2006	14:48,	3.045E+00,WG	L28833-15 E
B,15L28833-15	,LIBD		,06/06/2006	10:43,153L082604	
C,BE-7	,NO	1.963E+01,	2.125E+01,	3.699E+01,,	0.531
C,K-40	,NO	8.149E+01,	3.446E+01,	6.511E+01,,	1.252
C,CR-51	,NO	-2.984E-01,	2.395E+01,	3.959E+01,,	-0.008
C,MN-54	,NO	7.464E-01,	2.347E+00,	3.951E+00,,	0.189
C,CO-57	,NO	1.155E+00,	2.002E+00,	3.218E+00,,	0.359
C,CO-58	,NO	-2.428E+00,	2.650E+00,	4.093E+00,,	-0.593
C,FE-59	,NO	-7.202E-01,	5.381E+00,	8.799E+00,,	-0.082
C,CO-60	,NO	1.056E+00,	2.252E+00,	3.856E+00,,	0.274
C,ZN-65	,NO	-3.149E+00,	6.673E+00,	8.755E+00,,	-0.360
C,SE-75	,NO	2.006E+00,	3.093E+00,	5.119E+00,,	0.392
C,SR-85	,NO	6.715E+00,	2.892E+00,	5.232E+00,,	1.283
C,Y-88	,NO	1.717E+00,	3.011E+00,	5.288E+00,,	0.325
C,NB-94	,NO	2.143E+00,	2.174E+00,	3.754E+00,,	0.571
C,NB-95	,NO	5.259E-01,	2.596E+00,	4.357E+00,,	0.121
C,ZR-95	,NO	-4.538E+00,	4.576E+00,	7.075E+00,,	-0.641
C,MO-99	,NO	-2.262E+02,	5.204E+02,	8.377E+02,,	-0.270
C,RU-103	,NO	-1.999E+00,	2.754E+00,	4.396E+00,,	-0.455
C,RU-106	,NO	7.905E+00,	2.116E+01,	3.543E+01,,	0.223
C,AG-110m	,NO	-5.229E-01,	2.426E+00,	3.902E+00,,	-0.134
C,SN-113	,NO	1.968E+00,	3.095E+00,	5.208E+00,,	0.378
C,SB-124	,NO	-4.662E-01,	5.921E+00,	4.255E+00,,	-0.110
C,SB-125	,NO	4.513E+00,	6.415E+00,	1.080E+01,,	0.418
C,TE-129M	,NO	6.830E+00,	3.220E+01,	5.274E+01,,	0.130
C,I-131	,NO	3.420E-01,	6.967E+00,	1.147E+01,,	0.030
C,BA-133	,NO	-1.531E+00,	2.993E+00,	4.810E+00,,	-0.318
C,CS-134	,NO	3.019E+00,	3.372E+00,	4.283E+00,,	0.705
C,CS-136	,NO	4.536E-01,	4.683E+00,	7.775E+00,,	0.058
C,CS-137	,NO	1.452E+00,	2.537E+00,	4.282E+00,,	0.339
C,CE-139	,NO	2.148E-01,	2.017E+00,	3.345E+00,,	0.064
C,BA-140	,NO	8.093E+00,	1.607E+01,	2.730E+01,,	0.296
C,LA-140	,NO	-2.859E+00,	5.641E+00,	8.729E+00,,	-0.328
C,CE-141	,NO	4.774E+00,	4.896E+00,	7.249E+00,,	0.659
C,CE-144	,NO	-1.826E+00,	1.658E+01,	2.359E+01,,	-0.077
C,EU-152	,NO	-6.020E+00,	7.021E+00,	1.116E+01,,	-0.539
C,EU-154	,NO	2.998E+00,	4.124E+00,	6.660E+00,,	0.450
C,RA-226	,NO	-4.404E+01,	5.200E+01,	8.129E+01,,	-0.542
C,AC-228	,NO	1.375E+01,	8.776E+00,	1.592E+01,,	0.863
C,TH-228	,NO	1.633E-01,	4.132E+00,	6.491E+00,,	0.025
C,TH-232	,NO	1.368E+01,	8.736E+00,	1.585E+01,,	0.863
C,U-235	,NO	1.199E+01,	1.715E+01,	2.511E+01,,	0.477
C,U-238	,NO	2.614E+01,	2.549E+02,	4.179E+02,,	0.063
C,AM-241	,NO	-3.729E+01,	2.197E+01,	3.374E+01,,	-1.105

Sec. Review: Analyst: LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 13:31:47.46
 TBE23 03017322 HpGe ***** Aquisition Date/Time: 9-JUN-2006 09:49:36.24

LIMS No., Customer Name, Client ID: WG L28833-16 EXELON/ZION

Sample ID : 23L28833-16 Smple Date: 26-MAY-2006 15:10:00.
 Sample Type : WG Geometry : 233L082404
 Quantity : 3.03720E+00 L BKGFILE : 23BG060306MT
 Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 03:41:55.75
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:41:46.83
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	4	33.72*	30	14	1.09	67.77	8.15E-02	2.28E-03	57.0	1.37E+00
2	4	35.08*	20	99	1.76	70.48	1.03E-01	1.51E-03	163.0	
3	0	64.55*	212	854	2.11	129.38	1.09E+00	1.59E-02	33.9	
4	0	92.77*	69	754	1.50	185.79	1.94E+00	5.15E-03	88.8	
5	0	140.01*	71	526	1.13	280.20	2.32E+00	5.33E-03	64.3	
6	0	185.46*	28	526	1.27	371.03	2.18E+00	2.14E-03	176.9	
7	0	198.02*	51	377	1.54	396.13	2.11E+00	3.86E-03	73.4	
8	0	510.98*	49	131	2.97	1021.72	1.07E+00	3.68E-03	83.0	
9	0	595.65	82	78	1.61	1190.98	9.56E-01	6.14E-03	24.9	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
RA-226	186.21	28	3.28*	2.176E+00	2.664E+01	2.665E+01	353.72

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 23L28833-16

Acquisition date : 9-JUN-2006 09:49:36

Total number of lines in spectrum	9	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	1	11.11%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	2.664E+01	2.665E+01	9.425E+01	353.72	
			-----	-----			
		Total Activity :	2.664E+01	2.665E+01			

Grand Total Activity :	2.664E+01	2.665E+01
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Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 23L28833-16

Page : 3
Acquisition date : 9-JUN-2006 09:49:36

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	33.72	30	14	1.09	67.77	65	20	2.28E-03	****	8.15E-02	
4	35.08	20	99	1.76	70.48	65	20	1.51E-03	****	1.03E-01	
0	64.55	212	854	2.11	129.38	122	18	1.59E-02	67.7	1.09E+00	
0	92.77	69	754	1.50	185.79	180	13	5.15E-03	****	1.94E+00	
0	140.01	71	526	1.13	280.20	276	10	5.33E-03	****	2.32E+00	
0	198.02	51	377	1.54	396.13	392	9	3.86E-03	****	2.11E+00	
0	510.98	49	131	2.97	1021.72	1012	25	3.68E-03	****	1.07E+00	
0	595.65	82	78	1.61	1190.98	1183	13	6.14E-03	49.8	9.56E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	9
Number of unidentified lines	8
Number of lines tentatively identified by NID	1
	11.11%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
RA-226	1600.00Y	1.00	2.664E+01	2.665E+01	9.425E+01	353.72			
Total Activity :			2.664E+01	2.665E+01					

Grand Total Activity : 2.664E+01 2.665E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	2.665E+01	9.425E+01	1.230E+02	0.000E+00	0.217

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.429E+01		2.932E+01	4.860E+01	0.000E+00	-0.294
NA-24	-8.608E+00		6.607E+00	Half-Life too short		
K-40	2.142E+00		4.305E+01	8.644E+01	0.000E+00	0.025

CR-51	-6.180E+00	3.404E+01	5.771E+01	0.000E+00	-0.107
MN-54	1.119E+00	2.708E+00	4.811E+00	0.000E+00	0.233
CO-57	-1.996E+00	3.011E+00	4.991E+00	0.000E+00	-0.400
CO-58	-2.659E+00	3.074E+00	5.020E+00	0.000E+00	-0.530
FE-59	4.014E-02	5.856E+00	1.034E+01	0.000E+00	0.004
CO-60	-3.912E-01	2.539E+00	4.436E+00	0.000E+00	-0.088
ZN-65	1.159E+00	5.790E+00	1.033E+01	0.000E+00	0.112
SE-75	-1.722E+00	4.278E+00	7.226E+00	0.000E+00	-0.238
SR-85	1.797E+01	3.871E+00	7.036E+00	0.000E+00	2.554
Y-88	-1.567E+00	3.475E+00	5.935E+00	0.000E+00	-0.264
NB-94	-1.494E-01	2.686E+00	4.634E+00	0.000E+00	-0.032
NB-95	1.935E-01	3.089E+00	5.366E+00	0.000E+00	0.036
ZR-95	1.744E+00	5.629E+00	9.914E+00	0.000E+00	0.176
MO-99	3.483E+02	6.488E+02	1.162E+03	0.000E+00	0.300
RU-103	7.386E-01	3.655E+00	6.172E+00	0.000E+00	0.120
RU-106	-9.479E+00	2.540E+01	4.328E+01	0.000E+00	-0.219
AG-110m	6.336E-01	2.695E+00	4.749E+00	0.000E+00	0.133
SN-113	1.564E+00	4.003E+00	6.923E+00	0.000E+00	0.226
SB-124	-8.562E+00	3.518E+00	5.379E+00	0.000E+00	-1.592
SB-125	-2.678E+00	8.385E+00	1.406E+01	0.000E+00	-0.191
TE-129M	-1.557E+01	4.094E+01	6.838E+01	0.000E+00	-0.228
I-131	1.249E+00	9.580E+00	1.641E+01	0.000E+00	0.076
BA-133	1.619E+00	4.129E+00	7.128E+00	0.000E+00	0.227
CS-134	-3.592E-01	3.091E+00	5.307E+00	0.000E+00	-0.068
CS-136	-7.091E-01	5.302E+00	9.110E+00	0.000E+00	-0.078
CS-137	-5.272E-01	2.919E+00	5.021E+00	0.000E+00	-0.105
CE-139	6.385E-01	3.265E+00	5.483E+00	0.000E+00	0.116
BA-140	4.358E+00	1.995E+01	3.433E+01	0.000E+00	0.127
LA-140	1.467E+00	6.022E+00	1.108E+01	0.000E+00	0.132
CE-141	7.456E+00	8.045E+00	1.180E+01	0.000E+00	0.632
CE-144	-8.699E+00	2.785E+01	3.928E+01	0.000E+00	-0.221
EU-152	-6.785E+00	9.090E+00	1.506E+01	0.000E+00	-0.450
EU-154	4.183E-01	6.124E+00	1.032E+01	0.000E+00	0.041
AC-228	1.119E+01	1.154E+01	1.979E+01	0.000E+00	0.566
TH-228	-4.247E-01	5.909E+00	9.503E+00	0.000E+00	-0.045
TH-232	1.114E+01	1.148E+01	1.970E+01	0.000E+00	0.566
U-235	1.789E+01	2.863E+01	4.092E+01	0.000E+00	0.437
U-238	-2.404E+02	3.152E+02	5.030E+02	0.000E+00	-0.478
AM-241	1.315E+01	1.931E+01	2.782E+01	0.000E+00	0.473

A,23L28833-16	,06/09/2006	13:31,	05/26/2006	15:10,	3.037E+00,	WG L28833-16	E
B,23L28833-16	,LIBD					,06/01/2006	10:14,233L082404
C,RA-226	,YES,	2.665E+01,	9.425E+01,	1.230E+02,,	0.217		
C,BE-7	,NO ,	-1.429E+01,	2.932E+01,	4.860E+01,,	-0.294		
C,K-40	,NO ,	2.142E+00,	4.305E+01,	8.644E+01,,	0.025		
C,CR-51	,NO ,	-6.180E+00,	3.404E+01,	5.771E+01,,	-0.107		
C,MN-54	,NO ,	1.119E+00,	2.708E+00,	4.811E+00,,	0.233		
C,CO-57	,NO ,	-1.996E+00,	3.011E+00,	4.991E+00,,	-0.400		
C,CO-58	,NO ,	-2.659E+00,	3.074E+00,	5.020E+00,,	-0.530		
C,FE-59	,NO ,	4.014E-02,	5.856E+00,	1.034E+01,,	0.004		
C,CO-60	,NO ,	-3.912E-01,	2.539E+00,	4.436E+00,,	-0.088		
C,ZN-65	,NO ,	1.159E+00,	5.790E+00,	1.033E+01,,	0.112		
C,SE-75	,NO ,	-1.722E+00,	4.278E+00,	7.226E+00,,	-0.238		
C,SR-85	,NO ,	1.797E+01,	3.871E+00,	7.036E+00,,	2.554		
C,Y-88	,NO ,	-1.567E+00,	3.475E+00,	5.935E+00,,	-0.264		
C,NB-94	,NO ,	-1.494E-01,	2.686E+00,	4.634E+00,,	-0.032		
C,NB-95	,NO ,	1.935E-01,	3.089E+00,	5.366E+00,,	0.036		
C,ZR-95	,NO ,	1.744E+00,	5.629E+00,	9.914E+00,,	0.176		
C,MO-99	,NO ,	3.483E+02,	6.488E+02,	1.162E+03,,	0.300		
C,RU-103	,NO ,	7.386E-01,	3.655E+00,	6.172E+00,,	0.120		
C,RU-106	,NO ,	-9.479E+00,	2.540E+01,	4.328E+01,,	-0.219		
C,AG-110m	,NO ,	6.336E-01,	2.695E+00,	4.749E+00,,	0.133		
C,SN-113	,NO ,	1.564E+00,	4.003E+00,	6.923E+00,,	0.226		
C,SB-124	,NO ,	-8.562E+00,	3.518E+00,	5.379E+00,,	-1.592		
C,SB-125	,NO ,	-2.678E+00,	8.385E+00,	1.406E+01,,	-0.191		
C,TE-129M	,NO ,	-1.557E+01,	4.094E+01,	6.838E+01,,	-0.228		
C,I-131	,NO ,	1.249E+00,	9.580E+00,	1.641E+01,,	0.076		
C,BA-133	,NO ,	1.619E+00,	4.129E+00,	7.128E+00,,	0.227		
C,CS-134	,NO ,	-3.592E-01,	3.091E+00,	5.307E+00,,	-0.068		
C,CS-136	,NO ,	-7.091E-01,	5.302E+00,	9.110E+00,,	-0.078		
C,CS-137	,NO ,	-5.272E-01,	2.919E+00,	5.021E+00,,	-0.105		
C,CE-139	,NO ,	6.385E-01,	3.265E+00,	5.483E+00,,	0.116		
C,BA-140	,NO ,	4.358E+00,	1.995E+01,	3.433E+01,,	0.127		
C,LA-140	,NO ,	1.467E+00,	6.022E+00,	1.108E+01,,	0.132		
C,CE-141	,NO ,	7.456E+00,	8.045E+00,	1.180E+01,,	0.632		
C,CE-144	,NO ,	-8.699E+00,	2.785E+01,	3.928E+01,,	-0.221		
C,EU-152	,NO ,	-6.785E+00,	9.090E+00,	1.506E+01,,	-0.450		
C,EU-154	,NO ,	4.183E-01,	6.124E+00,	1.032E+01,,	0.041		
C,AC-228	,NO ,	1.119E+01,	1.154E+01,	1.979E+01,,	0.566		
C,TH-228	,NO ,	-4.247E-01,	5.909E+00,	9.503E+00,,	-0.045		
C,TH-232	,NO ,	1.114E+01,	1.148E+01,	1.970E+01,,	0.566		
C,U-235	,NO ,	1.789E+01,	2.863E+01,	4.092E+01,,	0.437		
C,U-238	,NO ,	-2.404E+02,	3.152E+02,	5.030E+02,,	-0.478		
C,AM-241	,NO ,	1.315E+01,	1.931E+01,	2.782E+01,,	0.473		

Summary of Nuclide Activity
 Sample ID : 14L28833-17

Page : 2
 Acquisition date : 9-JUN-2006 10:00:28

Total number of lines in spectrum	6	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	1	16.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
TH-228	1.91Y	1.01	3.271E-01	3.317E-01	53.44E-01	1610.96	
			-----	-----			
		Total Activity :	3.271E-01	3.317E-01			

Grand Total Activity : 3.271E-01 3.317E-01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 14L28833-17

Page : 3
Acquisition date : 9-JUN-2006 10:00:28

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.59	192	738	2.54	132.17	126	13	1.25E-02	60.2	4.90E-01	
1	92.86	16	394	1.37	186.86	183	8	1.02E-03	****	1.28E+00	
1	140.03	130	366	1.39	281.43	278	8	8.48E-03	53.7	1.90E+00	
1	198.53	160	381	2.02	398.67	394	11	1.04E-02	52.2	1.83E+00	
1	596.25	80	88	2.07	1194.27	1189	11	5.22E-03	50.7	8.47E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	6
Number of unidentified lines	5
Number of lines tentatively identified by NID	1 16.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
TH-228	1.91Y	1.01	3.271E-01	3.317E-01	53.44E-01	1610.96	
Total Activity :			3.271E-01	3.317E-01			

Grand Total Activity : 3.271E-01 3.317E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
TH-228	3.317E-01	5.344E+00	8.738E+00	0.000E+00	0.038

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.339E+00		3.137E+01	5.152E+01	0.000E+00	-0.045
NA-24	-3.724E+00		1.031E+01	Half-Life too short		
K-40	-2.118E+01		4.371E+01	7.827E+01	0.000E+00	-0.271
CR-51	-5.432E+01		3.747E+01	5.844E+01	0.000E+00	-0.929
MN-54	5.905E-01		3.168E+00	5.223E+00	0.000E+00	0.113
CO-57	-1.626E-01		3.109E+00	5.153E+00	0.000E+00	-0.032

CO-58	2.601E+00	3.338E+00	5.706E+00	0.000E+00	0.456
FE-59	9.816E-01	7.059E+00	1.166E+01	0.000E+00	0.084
CO-60	-1.487E+00	2.932E+00	4.618E+00	0.000E+00	-0.322
ZN-65	-9.873E-01	6.623E+00	1.071E+01	0.000E+00	-0.092
SE-75	8.831E-01	4.246E+00	7.069E+00	0.000E+00	0.125
SR-85	1.719E+01	4.028E+00	7.543E+00	0.000E+00	2.280
Y-88	3.853E-01	3.654E+00	6.045E+00	0.000E+00	0.064
NB-94	7.757E-01	3.015E+00	5.035E+00	0.000E+00	0.154
NB-95	3.258E+00	3.369E+00	5.823E+00	0.000E+00	0.560
ZR-95	-2.292E+00	6.141E+00	9.865E+00	0.000E+00	-0.232
MO-99	-3.469E+02	8.072E+02	1.295E+03	0.000E+00	-0.268
RU-103	1.145E+00	3.883E+00	6.464E+00	0.000E+00	0.177
RU-106	1.353E+01	2.926E+01	4.967E+01	0.000E+00	0.272
AG-110m	-4.904E-02	3.095E+00	5.120E+00	0.000E+00	-0.010
SN-113	6.719E-01	4.250E+00	6.938E+00	0.000E+00	0.097
SB-124	-6.773E+00	4.732E+00	5.815E+00	0.000E+00	-1.165
SB-125	2.884E+00	8.684E+00	1.458E+01	0.000E+00	0.198
TE-129M	-3.092E+01	4.531E+01	7.265E+01	0.000E+00	-0.426
I-131	3.115E-01	1.078E+01	1.757E+01	0.000E+00	0.018
BA-133	4.531E+00	4.356E+00	7.362E+00	0.000E+00	0.615
CS-134	-4.888E-01	3.396E+00	5.483E+00	0.000E+00	-0.089
CS-136	-6.228E-01	6.327E+00	1.027E+01	0.000E+00	-0.061
CS-137	-1.394E+00	3.276E+00	5.302E+00	0.000E+00	-0.263
CE-139	-3.553E-01	3.109E+00	5.084E+00	0.000E+00	-0.070
BA-140	-1.347E+01	2.315E+01	3.682E+01	0.000E+00	-0.366
LA-140	4.811E-01	7.013E+00	1.168E+01	0.000E+00	0.041
CE-141	3.984E+00	7.704E+00	1.100E+01	0.000E+00	0.362
CE-144	3.271E+00	2.710E+01	3.827E+01	0.000E+00	0.085
EU-152	-1.657E+01	9.783E+00	1.500E+01	0.000E+00	-1.105
EU-154	2.530E+00	6.242E+00	1.046E+01	0.000E+00	0.242
RA-226	2.997E+00	7.737E+01	1.228E+02	0.000E+00	0.024
AC-228	1.853E+00	1.135E+01	1.869E+01	0.000E+00	0.099
TH-232	1.844E+00	1.130E+01	1.860E+01	0.000E+00	0.099
U-235	2.282E+01	2.696E+01	3.895E+01	0.000E+00	0.586
U-238	2.841E+02	3.177E+02	5.539E+02	0.000E+00	0.513
AM-241	-6.292E+01	4.761E+01	6.340E+01	0.000E+00	-0.992

		06/09/2006	14:16,05/26/2006	08:45,	3.064E+00,WG	L28833-17	E
A,14L28833-17							
B,14L28833-17							
C,TH-228	,YES,	3.317E-01,	5.344E+00,	8.738E+00,,	0.038		
C,BE-7	,NO,	-2.339E+00,	3.137E+01,	5.152E+01,,	-0.045		
C,K-40	,NO,	-2.118E+01,	4.371E+01,	7.827E+01,,	-0.271		
C,CR-51	,NO,	-5.432E+01,	3.747E+01,	5.844E+01,,	-0.929		
C,MN-54	,NO,	5.905E-01,	3.168E+00,	5.223E+00,,	0.113		
C,CO-57	,NO,	-1.626E-01,	3.109E+00,	5.153E+00,,	-0.032		
C,CO-58	,NO,	2.601E+00,	3.338E+00,	5.706E+00,,	0.456		
C,FE-59	,NO,	9.816E-01,	7.059E+00,	1.166E+01,,	0.084		
C,CO-60	,NO,	-1.487E+00,	2.932E+00,	4.618E+00,,	-0.322		
C,ZN-65	,NO,	-9.873E-01,	6.623E+00,	1.071E+01,,	-0.092		
C,SE-75	,NO,	8.831E-01,	4.246E+00,	7.069E+00,,	0.125		
C,SR-85	,NO,	1.719E+01,	4.028E+00,	7.543E+00,,	2.280		
C,Y-88	,NO,	3.853E-01,	3.654E+00,	6.045E+00,,	0.064		
C,NB-94	,NO,	7.757E-01,	3.015E+00,	5.035E+00,,	0.154		
C,NB-95	,NO,	3.258E+00,	3.369E+00,	5.823E+00,,	0.560		
C,ZR-95	,NO,	-2.292E+00,	6.141E+00,	9.865E+00,,	-0.232		
C,MO-99	,NO,	-3.469E+02,	8.072E+02,	1.295E+03,,	-0.268		
C,RU-103	,NO,	1.145E+00,	3.883E+00,	6.464E+00,,	0.177		
C,RU-106	,NO,	1.353E+01,	2.926E+01,	4.967E+01,,	0.272		
C,AG-110m	,NO,	-4.904E-02,	3.095E+00,	5.120E+00,,	-0.010		
C,SN-113	,NO,	6.719E-01,	4.250E+00,	6.938E+00,,	0.097		
C,SB-124	,NO,	-6.773E+00,	4.732E+00,	5.815E+00,,	-1.165		
C,SB-125	,NO,	2.884E+00,	8.684E+00,	1.458E+01,,	0.198		
C,TE-129M	,NO,	-3.092E+01,	4.531E+01,	7.265E+01,,	-0.426		
C,I-131	,NO,	3.115E-01,	1.078E+01,	1.757E+01,,	0.018		
C,BA-133	,NO,	4.531E+00,	4.356E+00,	7.362E+00,,	0.615		
C,CS-134	,NO,	-4.888E-01,	3.396E+00,	5.483E+00,,	-0.089		
C,CS-136	,NO,	-6.228E-01,	6.327E+00,	1.027E+01,,	-0.061		
C,CS-137	,NO,	-1.394E+00,	3.276E+00,	5.302E+00,,	-0.263		
C,CE-139	,NO,	-3.553E-01,	3.109E+00,	5.084E+00,,	-0.070		
C,BA-140	,NO,	-1.347E+01,	2.315E+01,	3.682E+01,,	-0.366		
C,LA-140	,NO,	4.811E-01,	7.013E+00,	1.168E+01,,	0.041		
C,CE-141	,NO,	3.984E+00,	7.704E+00,	1.100E+01,,	0.362		
C,CE-144	,NO,	3.271E+00,	2.710E+01,	3.827E+01,,	0.085		
C,EU-152	,NO,	-1.657E+01,	9.783E+00,	1.500E+01,,	-1.105		
C,EU-154	,NO,	2.530E+00,	6.242E+00,	1.046E+01,,	0.242		
C,RA-226	,NO,	2.997E+00,	7.737E+01,	1.228E+02,,	0.024		
C,AC-228	,NO,	1.853E+00,	1.135E+01,	1.869E+01,,	0.099		
C,TH-232	,NO,	1.844E+00,	1.130E+01,	1.860E+01,,	0.099		
C,U-235	,NO,	2.282E+01,	2.696E+01,	3.895E+01,,	0.586		
C,U-238	,NO,	2.841E+02,	3.177E+02,	5.539E+02,,	0.513		
C,AM-241	,NO,	-6.292E+01,	4.761E+01,	6.340E+01,,	-0.992		

Summary of Nuclide Activity

Page : 2

Sample ID : 10L28833-18

Acquisition date : 9-JUN-2006 11:15:18

Total number of lines in spectrum	11	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	2	18.18%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	7.532E+00	7.532E+00	53.32E+00	708.00	
RA-226	1600.00Y	1.00	6.465E+00	6.465E+00	61.91E+00	957.50	
U-235	7.04E+08Y	1.00	3.927E-01	3.927E-01	37.60E-01	957.50	K
Total Activity :			1.439E+01	1.439E+01			

Grand Total Activity : 1.439E+01 1.439E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Page : 3

Sample ID : 10L28833-18

Acquisition date : 9-JUN-2006 11:15:18

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.49	55	482	1.31	132.09	129	7	3.19E-03	****	7.33E-01	
1	92.82	37	447	1.48	184.78	181	8	2.15E-03	****	1.52E+00	
1	140.06	134	526	1.75	279.30	275	9	7.82E-03	64.0	1.91E+00	
1	198.66	66	476	1.64	396.55	391	11	3.82E-03	****	1.71E+00	
1	352.21	10	178	1.97	703.81	699	10	5.66E-04	****	1.17E+00	
1	596.03	60	115	2.51	1191.74	1187	12	3.52E-03	75.4	7.85E-01	
1	609.66	60	99	1.89	1219.02	1213	12	3.51E-03	80.9	7.72E-01	
1	1756.33	61	24	1.05	3514.48	3508	11	3.53E-03	33.0	3.40E-01	
1	1765.19	6	17	1.84	3532.22	3525	14	3.25E-04	****	3.39E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 11
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 2 18.18%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	7.532E+00	7.532E+00	53.32E+00	708.00			
RA-226	1600.00Y	1.00	6.465E+00	6.465E+00	61.91E+00	957.50			
Total Activity :			1.400E+01	1.400E+01					

Grand Total Activity : 1.400E+01 1.400E+01

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	7.532E+00	5.332E+01	4.374E+01	0.000E+00	0.172
RA-226	6.465E+00	6.191E+01	1.183E+02	0.000E+00	0.055

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
---------	---------------------------------	--------------	-----------	----------------	-----------	---------

BE-7	2.328E+01	2.846E+01	4.887E+01	0.000E+00	0.476
NA-24	-2.581E+00	8.309E+00	Half-Life too short		
CR-51	-4.573E+01	3.618E+01	5.698E+01	0.000E+00	-0.803
MN-54	6.623E-01	2.984E+00	4.988E+00	0.000E+00	0.133
CO-57	-1.671E+00	2.983E+00	4.872E+00	0.000E+00	-0.343
CO-58	1.443E-01	3.118E+00	5.169E+00	0.000E+00	0.028
FE-59	2.312E+00	6.878E+00	1.166E+01	0.000E+00	0.198
CO-60	2.030E+00	2.842E+00	4.949E+00	0.000E+00	0.410
ZN-65	4.035E+00	6.155E+00	1.066E+01	0.000E+00	0.378
SE-75	-2.232E+00	4.292E+00	7.006E+00	0.000E+00	-0.319
SR-85	2.254E+01	4.014E+00	7.796E+00	0.000E+00	2.891
Y-88	-6.658E-01	3.564E+00	5.728E+00	0.000E+00	-0.116
NB-94	-2.853E+00	2.871E+00	4.409E+00	0.000E+00	-0.647
NB-95	1.594E+00	3.140E+00	5.357E+00	0.000E+00	0.298
ZR-95	2.815E+00	5.564E+00	9.500E+00	0.000E+00	0.296
MO-99	5.787E+01	7.249E+02	1.210E+03	0.000E+00	0.048
RU-103	8.651E-01	3.823E+00	6.391E+00	0.000E+00	0.135
RU-106	2.201E+01	2.861E+01	4.754E+01	0.000E+00	0.463
AG-110m	1.021E+00	2.806E+00	4.676E+00	0.000E+00	0.218
SN-113	-2.715E+00	4.142E+00	6.573E+00	0.000E+00	-0.413
SB-124	-5.155E-01	7.978E+00	5.494E+00	0.000E+00	-0.094
SB-125	5.952E+00	8.581E+00	1.435E+01	0.000E+00	0.415
TE-129M	1.905E+01	4.132E+01	7.004E+01	0.000E+00	0.272
I-131	-1.517E+00	1.013E+01	1.648E+01	0.000E+00	-0.092
BA-133	3.472E+00	5.025E+00	7.206E+00	0.000E+00	0.482
CS-134	2.831E+00	6.984E+00	5.256E+00	0.000E+00	0.539
CS-136	-1.784E+00	5.788E+00	9.382E+00	0.000E+00	-0.190
CS-137	8.393E-01	3.053E+00	5.060E+00	0.000E+00	0.166
CE-139	1.363E+00	3.186E+00	5.272E+00	0.000E+00	0.258
BA-140	3.707E+00	2.168E+01	3.605E+01	0.000E+00	0.103
LA-140	1.014E+00	7.291E+00	1.220E+01	0.000E+00	0.083
CE-141	1.734E+00	7.890E+00	1.110E+01	0.000E+00	0.156
CE-144	5.491E+00	2.747E+01	3.875E+01	0.000E+00	0.142
EU-152	-1.022E+01	1.151E+01	1.519E+01	0.000E+00	-0.673
EU-154	-2.930E+00	6.078E+00	9.941E+00	0.000E+00	-0.295
AC-228	2.270E-01	1.200E+01	1.905E+01	0.000E+00	0.012
TH-228	2.589E+00	6.151E+00	1.006E+01	0.000E+00	0.257
TH-232	2.260E-01	1.194E+01	1.897E+01	0.000E+00	0.012
U-235	1.818E+01	2.749E+01	3.924E+01	0.000E+00	0.463
U-238	5.363E+02	3.347E+02	6.019E+02	0.000E+00	0.891
AM-241	-2.845E+01	2.834E+01	4.080E+01	0.000E+00	-0.697

A, 10L28833-18		, 06/09/2006 16:01, 05/26/2006 13:15,		3.017E+00, WG L28833-18 E	
B, 10L28833-18		, LIBD		, 06/07/2006 09:32, 103L083004	
C, K-40	, YES,	7.532E+00,	5.332E+01,	4.374E+01,,	0.172
C, RA-226	, YES,	6.465E+00,	6.191E+01,	1.183E+02,,	0.055
C, BE-7	, NO,	2.328E+01,	2.846E+01,	4.887E+01,,	0.476
C, CR-51	, NO,	-4.573E+01,	3.618E+01,	5.698E+01,,	-0.803
C, MN-54	, NO,	6.623E-01,	2.984E+00,	4.988E+00,,	0.133
C, CO-57	, NO,	-1.671E+00,	2.983E+00,	4.872E+00,,	-0.343
C, CO-58	, NO,	1.443E-01,	3.118E+00,	5.169E+00,,	0.028
C, FE-59	, NO,	2.312E+00,	6.878E+00,	1.166E+01,,	0.198
C, CO-60	, NO,	2.030E+00,	2.842E+00,	4.949E+00,,	0.410
C, ZN-65	, NO,	4.035E+00,	6.155E+00,	1.066E+01,,	0.378
C, SE-75	, NO,	-2.232E+00,	4.292E+00,	7.006E+00,,	-0.319
C, SR-85	, NO,	2.254E+01,	4.014E+00,	7.796E+00,,	2.891
C, Y-88	, NO,	-6.658E-01,	3.564E+00,	5.728E+00,,	-0.116
C, NB-94	, NO,	-2.853E+00,	2.871E+00,	4.409E+00,,	-0.647
C, NB-95	, NO,	1.594E+00,	3.140E+00,	5.357E+00,,	0.298
C, ZR-95	, NO,	2.815E+00,	5.564E+00,	9.500E+00,,	0.296
C, MO-99	, NO,	5.787E+01,	7.249E+02,	1.210E+03,,	0.048
C, RU-103	, NO,	8.651E-01,	3.823E+00,	6.391E+00,,	0.135
C, RU-106	, NO,	2.201E+01,	2.861E+01,	4.754E+01,,	0.463
C, AG-110m	, NO,	1.021E+00,	2.806E+00,	4.676E+00,,	0.218
C, SN-113	, NO,	-2.715E+00,	4.142E+00,	6.573E+00,,	-0.413
C, SB-124	, NO,	-5.155E-01,	7.978E+00,	5.494E+00,,	-0.094
C, SB-125	, NO,	5.952E+00,	8.581E+00,	1.435E+01,,	0.415
C, TE-129M	, NO,	1.905E+01,	4.132E+01,	7.004E+01,,	0.272
C, I-131	, NO,	-1.517E+00,	1.013E+01,	1.648E+01,,	-0.092
C, BA-133	, NO,	3.472E+00,	5.025E+00,	7.206E+00,,	0.482
C, CS-134	, NO,	2.831E+00,	6.984E+00,	5.256E+00,,	0.539
C, CS-136	, NO,	-1.784E+00,	5.788E+00,	9.382E+00,,	-0.190
C, CS-137	, NO,	8.393E-01,	3.053E+00,	5.060E+00,,	0.166
C, CE-139	, NO,	1.363E+00,	3.186E+00,	5.272E+00,,	0.258
C, BA-140	, NO,	3.707E+00,	2.168E+01,	3.605E+01,,	0.103
C, LA-140	, NO,	1.014E+00,	7.291E+00,	1.220E+01,,	0.083
C, CE-141	, NO,	1.734E+00,	7.890E+00,	1.110E+01,,	0.156
C, CE-144	, NO,	5.491E+00,	2.747E+01,	3.875E+01,,	0.142
C, EU-152	, NO,	-1.022E+01,	1.151E+01,	1.519E+01,,	-0.673
C, EU-154	, NO,	-2.930E+00,	6.078E+00,	9.941E+00,,	-0.295
C, AC-228	, NO,	2.270E-01,	1.200E+01,	1.905E+01,,	0.012
C, TH-228	, NO,	2.589E+00,	6.151E+00,	1.006E+01,,	0.257
C, TH-232	, NO,	2.260E-01,	1.194E+01,	1.897E+01,,	0.012
C, U-235	, NO,	1.818E+01,	2.749E+01,	3.924E+01,,	0.463
C, U-238	, NO,	5.363E+02,	3.347E+02,	6.019E+02,,	0.891
C, AM-241	, NO,	-2.845E+01,	2.834E+01,	4.080E+01,,	-0.697

Sec. Review: Analyst: LIMS: ___

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 16:51:42.84
 TBE04 P-40312B HpGe ***** Aquisition Date/Time: 9-JUN-2006 12:57:07.37

LIMS No., Customer Name, Client ID: WG L28833-19 EXELON/ZION

Sample ID : 04L28833-19 Smple Date: 26-MAY-2006 11:00:00.
 Sample Type : WG Geometry : 043L082004
 Quantity : 3.02650E+00 L BKGFILE : 04BG060306MT
 Start Channel : 90 Energy Tol : 1.00000 Real Time : 0 03:54:32.42
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:54:30.05
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	53.26	76	288	1.61	106.99	2.38E-01	5.37E-03	42.3	1.44E+00
2	1	66.01*	92	383	1.26	132.48	6.52E-01	6.53E-03	40.1	6.38E+00
3	1	139.38	212	380	2.54	279.21	2.04E+00	1.51E-02	19.7	3.04E+00
4	1	198.50*	37	301	2.00	397.42	1.86E+00	2.62E-03	98.6	2.27E+00
5	1	295.39	47	185	2.07	591.18	1.45E+00	3.31E-03	57.1	1.82E+00
6	1	584.42	96	74	1.02	1169.07	8.76E-01	6.79E-03	19.8	3.48E+01
7	1	597.14	109	89	1.16	1194.52	8.62E-01	7.73E-03	18.1	6.79E+01
8	1	609.35*	31	88	2.20	1218.93	8.48E-01	2.24E-03	75.4	8.22E-01
9	1	1461.69	77	40	2.94	2922.74	4.29E-01	5.48E-03	22.7	1.41E+00
10	1	1504.07	36	18	1.37	3007.44	4.20E-01	2.56E-03	25.8	1.97E+01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	77	10.67*	4.294E-01	1.068E+02	1.068E+02	45.33

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 04L28833-19

Acquisition date : 9-JUN-2006 12:57:07

Total number of lines in spectrum	10	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	2	20.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.068E+02	1.068E+02	0.484E+02	45.33	
Total Activity :			1.068E+02	1.068E+02			

Grand Total Activity : 1.068E+02 1.068E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 04L28833-19

Page : 3
Acquisition date : 9-JUN-2006 12:57:07

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	53.26	76	288	1.61	106.99	102	9	5.37E-03	84.6	2.38E-01	
1	66.01	92	383	1.26	132.48	130	8	6.53E-03	80.1	6.52E-01	
1	139.38	212	380	2.54	279.21	273	12	1.51E-02	39.3	2.04E+00	
1	198.50	37	301	2.00	397.42	392	10	2.62E-03	****	1.86E+00	
1	295.39	47	185	2.07	591.18	585	10	3.31E-03	****	1.45E+00	
1	584.42	96	74	1.02	1169.07	1163	12	6.79E-03	39.7	8.76E-01	
1	597.14	109	89	1.16	1194.52	1189	12	7.73E-03	36.2	8.62E-01	
1	609.35	31	88	2.20	1218.93	1212	14	2.24E-03	****	8.48E-01	
1	1504.07	36	18	1.37	3007.44	3000	12	2.56E-03	51.6	4.20E-01	T

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	10
Number of unidentified lines	8
Number of lines tentatively identified by NID	2 20.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.068E+02	1.068E+02	0.484E+02	45.33	
Total Activity :			1.068E+02	1.068E+02			

Grand Total Activity : 1.068E+02 1.068E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.068E+02	4.841E+01	4.700E+01	0.000E+00	2.272

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.160E+01		2.575E+01	4.360E+01	0.000E+00	0.266
NA-24	-9.450E+00		9.874E+00	Half-Life too short		

CR-51	-3.720E+01	3.250E+01	5.092E+01	0.000E+00	-0.731
MN-54	-3.822E+00	2.709E+00	3.926E+00	0.000E+00	-0.974
CO-57	-1.996E-01	2.482E+00	4.146E+00	0.000E+00	-0.048
CO-58	-3.183E-01	3.106E+00	5.042E+00	0.000E+00	-0.063
FE-59	-9.613E-01	6.421E+00	1.037E+01	0.000E+00	-0.093
CO-60	3.259E+00	3.444E+00	5.958E+00	0.000E+00	0.547
ZN-65	2.344E+00	6.120E+00	1.031E+01	0.000E+00	0.227
SE-75	6.755E-01	3.700E+00	6.199E+00	0.000E+00	0.109
SR-85	1.712E+01	3.759E+00	7.245E+00	0.000E+00	2.363
Y-88	1.362E+00	3.481E+00	5.935E+00	0.000E+00	0.229
NB-94	-1.142E-01	2.663E+00	4.388E+00	0.000E+00	-0.026
NB-95	1.677E+00	3.156E+00	5.363E+00	0.000E+00	0.313
ZR-95	-2.554E+00	5.355E+00	8.504E+00	0.000E+00	-0.300
MO-99	5.371E+02	7.273E+02	1.254E+03	0.000E+00	0.428
RU-103	2.155E+00	3.592E+00	6.100E+00	0.000E+00	0.353
RU-106	-4.685E+00	2.602E+01	4.110E+01	0.000E+00	-0.114
AG-110m	4.746E-01	2.852E+00	4.782E+00	0.000E+00	0.099
SN-113	2.394E+00	3.864E+00	6.469E+00	0.000E+00	0.370
SB-124	4.083E+00	6.218E+00	5.221E+00	0.000E+00	0.782
SB-125	-2.216E+00	7.559E+00	1.240E+01	0.000E+00	-0.179
TE-129M	-9.875E+00	4.168E+01	6.827E+01	0.000E+00	-0.145
I-131	-5.399E+00	9.042E+00	1.433E+01	0.000E+00	-0.377
BA-133	5.229E+00	3.995E+00	6.889E+00	0.000E+00	0.759
CS-134	5.371E+00	5.437E+00	4.846E+00	0.000E+00	1.108
CS-136	-3.768E+00	5.746E+00	8.943E+00	0.000E+00	-0.421
CS-137	-1.940E+00	3.145E+00	5.030E+00	0.000E+00	-0.386
CE-139	1.472E-01	2.730E+00	4.512E+00	0.000E+00	0.033
BA-140	6.186E+00	2.005E+01	3.348E+01	0.000E+00	0.185
LA-140	-1.485E+00	7.365E+00	1.195E+01	0.000E+00	-0.124
CE-141	1.822E+00	6.593E+00	9.479E+00	0.000E+00	0.192
CE-144	2.244E-01	2.218E+01	3.168E+01	0.000E+00	0.007
EU-152	-1.439E+01	8.897E+00	1.355E+01	0.000E+00	-1.062
EU-154	-1.645E+00	5.086E+00	8.432E+00	0.000E+00	-0.195
RA-226	-3.532E+00	6.749E+01	1.075E+02	0.000E+00	-0.033
AC-228	-6.101E+00	1.135E+01	1.786E+01	0.000E+00	-0.342
TH-228	9.238E+00	5.550E+00	9.464E+00	0.000E+00	0.976
TH-232	-6.073E+00	1.130E+01	1.778E+01	0.000E+00	-0.342
U-235	-1.272E+00	2.296E+01	3.255E+01	0.000E+00	-0.039
U-238	2.169E+02	3.261E+02	5.627E+02	0.000E+00	0.385
AM-241	-3.622E+01	3.102E+01	4.190E+01	0.000E+00	-0.864

A,04L28833-19	,06/09/2006	16:51,05/26/2006	11:00,	3.026E+00,WG	L28833-19 E
B,04L28833-19	,LIBD	,06/02/2006	09:04,	043L082004	
C,K-40	,YES,	1.068E+02,	4.841E+01,	4.700E+01,,	2.272
C,BE-7	,NO,	1.160E+01,	2.575E+01,	4.360E+01,,	0.266
C,CR-51	,NO,	-3.720E+01,	3.250E+01,	5.092E+01,,	-0.731
C,MN-54	,NO,	-3.822E+00,	2.709E+00,	3.926E+00,,	-0.974
C,CO-57	,NO,	-1.996E-01,	2.482E+00,	4.146E+00,,	-0.048
C,CO-58	,NO,	-3.183E-01,	3.106E+00,	5.042E+00,,	-0.063
C,FE-59	,NO,	-9.613E-01,	6.421E+00,	1.037E+01,,	-0.093
C,CO-60	,NO,	3.259E+00,	3.444E+00,	5.958E+00,,	0.547
C,ZN-65	,NO,	2.344E+00,	6.120E+00,	1.031E+01,,	0.227
C,SE-75	,NO,	6.755E-01,	3.700E+00,	6.199E+00,,	0.109
C,SR-85	,NO,	1.712E+01,	3.759E+00,	7.245E+00,,	2.363
C,Y-88	,NO,	1.362E+00,	3.481E+00,	5.935E+00,,	0.229
C,NB-94	,NO,	-1.142E-01,	2.663E+00,	4.388E+00,,	-0.026
C,NB-95	,NO,	1.677E+00,	3.156E+00,	5.363E+00,,	0.313
C,ZR-95	,NO,	-2.554E+00,	5.355E+00,	8.504E+00,,	-0.300
C,MO-99	,NO,	5.371E+02,	7.273E+02,	1.254E+03,,	0.428
C,RU-103	,NO,	2.155E+00,	3.592E+00,	6.100E+00,,	0.353
C,RU-106	,NO,	-4.685E+00,	2.602E+01,	4.110E+01,,	-0.114
C,AG-110m	,NO,	4.746E-01,	2.852E+00,	4.782E+00,,	0.099
C,SN-113	,NO,	2.394E+00,	3.864E+00,	6.469E+00,,	0.370
C,SB-124	,NO,	4.083E+00,	6.218E+00,	5.221E+00,,	0.782
C,SB-125	,NO,	-2.216E+00,	7.559E+00,	1.240E+01,,	-0.179
C,TE-129M	,NO,	-9.875E+00,	4.168E+01,	6.827E+01,,	-0.145
C,I-131	,NO,	-5.399E+00,	9.042E+00,	1.433E+01,,	-0.377
C,BA-133	,NO,	5.229E+00,	3.995E+00,	6.889E+00,,	0.759
C,CS-134	,NO,	5.371E+00,	5.437E+00,	4.846E+00,,	1.108
C,CS-136	,NO,	-3.768E+00,	5.746E+00,	8.943E+00,,	-0.421
C,CS-137	,NO,	-1.940E+00,	3.145E+00,	5.030E+00,,	-0.386
C,CE-139	,NO,	1.472E-01,	2.730E+00,	4.512E+00,,	0.033
C,BA-140	,NO,	6.186E+00,	2.005E+01,	3.348E+01,,	0.185
C,LA-140	,NO,	-1.485E+00,	7.365E+00,	1.195E+01,,	-0.124
C,CE-141	,NO,	1.822E+00,	6.593E+00,	9.479E+00,,	0.192
C,CE-144	,NO,	2.244E-01,	2.218E+01,	3.168E+01,,	0.007
C,EU-152	,NO,	-1.439E+01,	8.897E+00,	1.355E+01,,	-1.062
C,EU-154	,NO,	-1.645E+00,	5.086E+00,	8.432E+00,,	-0.195
C,RA-226	,NO,	-3.532E+00,	6.749E+01,	1.075E+02,,	-0.033
C,AC-228	,NO,	-6.101E+00,	1.135E+01,	1.786E+01,,	-0.342
C,TH-228	,NO,	9.238E+00,	5.550E+00,	9.464E+00,,	0.976
C,TH-232	,NO,	-6.073E+00,	1.130E+01,	1.778E+01,,	-0.342
C,U-235	,NO,	-1.272E+00,	2.296E+01,	3.255E+01,,	-0.039
C,U-238	,NO,	2.169E+02,	3.261E+02,	5.627E+02,,	0.385
C,AM-241	,NO,	-3.622E+01,	3.102E+01,	4.190E+01,,	-0.864

Sec. Review: Analyst: LIMS: _____

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 16:51:56.96
 TBE07 P-10768B HpGe ***** Aquisition Date/Time: 9-JUN-2006 12:51:13.46

LIMS No., Customer Name, Client ID: WGL28833-20 EXELON/ZION

Sample ID : 07L28833-20 Smple Date: 26-MAY-2006 16:00:00.
 Sample Type : WG Geometry : 073L082504
 Quantity : 3.00410E+00 L BKGFILE : 07BG060306MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:00:35.31
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:00:32.54
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	5	66.48*	135	341	1.28	133.53	8.12E-01	9.36E-03	26.5	1.57E+00
2	1	139.67*	125	386	1.28	280.02	2.36E+00	8.68E-03	31.4	1.96E+00
3	1	198.48*	105	356	1.57	397.73	2.24E+00	7.29E-03	38.8	4.77E-01
4	1	499.83	46	66	1.47	1000.76	1.25E+00	3.16E-03	32.8	1.79E+00
5	1	596.12	84	108	1.67	1193.40	1.10E+00	5.85E-03	27.8	8.09E-01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 07L28833-20

Acquisition date : 9-JUN-2006 12:51:13

Total number of lines in spectrum	5	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 07L28833-20

Page : 3
Acquisition date : 9-JUN-2006 12:51:13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	66.48	135	341	1.28	133.53	122	16	9.36E-03	52.9	8.12E-01	
1	139.67	125	386	1.28	280.02	276	9	8.68E-03	62.7	2.36E+00	
1	198.48	105	356	1.57	397.73	393	11	7.29E-03	77.6	2.24E+00	
1	499.83	46	66	1.47	1000.76	998	7	3.16E-03	65.5	1.25E+00	
1	596.12	84	108	1.67	1193.40	1187	13	5.85E-03	55.5	1.10E+00	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	5	
Number of unidentified lines	5	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.504E+00		2.491E+01	4.067E+01	0.000E+00	0.037
NA-24	9.916E+00		6.542E+00	Half-Life too short		
K-40	4.822E+00		3.458E+01	6.116E+01	0.000E+00	0.079
CR-51	-3.936E+01		2.845E+01	4.502E+01	0.000E+00	-0.874
MN-54	1.784E+00		2.518E+00	4.328E+00	0.000E+00	0.412
CO-57	-8.443E-01		2.393E+00	3.872E+00	0.000E+00	-0.218
CO-58	-7.301E-04		2.614E+00	4.327E+00	0.000E+00	0.000
FE-59	1.200E+00		5.533E+00	9.299E+00	0.000E+00	0.129
CO-60	-5.849E-01		2.522E+00	4.039E+00	0.000E+00	-0.145
ZN-65	-1.335E+00		5.277E+00	8.583E+00	0.000E+00	-0.156
SE-75	-3.694E+00		3.545E+00	5.580E+00	0.000E+00	-0.662
SR-85	1.910E+01		3.320E+00	6.518E+00	0.000E+00	2.930
Y-88	-1.462E+00		2.865E+00	4.512E+00	0.000E+00	-0.324
NB-94	-6.452E-01		2.488E+00	4.005E+00	0.000E+00	-0.161
NB-95	1.303E+00		2.770E+00	4.720E+00	0.000E+00	0.276
ZR-95	-4.256E+00		4.807E+00	7.368E+00	0.000E+00	-0.578
MO-99	-5.494E+02		6.306E+02	9.730E+02	0.000E+00	-0.565
RU-103	2.063E+00		3.200E+00	5.352E+00	0.000E+00	0.386
RU-106	-9.765E+00		2.394E+01	3.856E+01	0.000E+00	-0.253
AG-110m	6.319E-01		2.478E+00	4.117E+00	0.000E+00	0.153
SN-113	-6.138E-01		3.367E+00	5.503E+00	0.000E+00	-0.112
SB-124	-8.298E+00		3.905E+00	4.644E+00	0.000E+00	-1.787
SB-125	-5.714E+00		7.191E+00	1.137E+01	0.000E+00	-0.502

TE-129M	-1.506E+01	3.546E+01	5.670E+01	0.000E+00	-0.266
I-131	-3.223E+00	7.792E+00	1.267E+01	0.000E+00	-0.254
BA-133	2.105E+00	3.446E+00	5.832E+00	0.000E+00	0.361
CS-134	-1.154E+00	2.821E+00	4.569E+00	0.000E+00	-0.253
CS-136	-1.290E+00	4.701E+00	7.645E+00	0.000E+00	-0.169
CS-137	-8.162E-01	2.656E+00	4.278E+00	0.000E+00	-0.191
CE-139	5.681E-01	2.413E+00	4.052E+00	0.000E+00	0.140
BA-140	1.177E+01	1.754E+01	3.006E+01	0.000E+00	0.392
LA-140	-3.672E+00	6.173E+00	9.634E+00	0.000E+00	-0.381
CE-141	1.073E-01	6.174E+00	8.521E+00	0.000E+00	0.013
CE-144	3.818E+00	2.197E+01	3.066E+01	0.000E+00	0.125
EU-152	-1.107E+01	8.139E+00	1.285E+01	0.000E+00	-0.861
EU-154	-8.965E-01	4.879E+00	7.930E+00	0.000E+00	-0.113
RA-226	-7.153E+00	6.253E+01	1.029E+02	0.000E+00	-0.070
AC-228	1.742E+00	9.904E+00	1.604E+01	0.000E+00	0.109
TH-228	1.512E+00	4.975E+00	8.206E+00	0.000E+00	0.184
TH-232	1.734E+00	9.859E+00	1.597E+01	0.000E+00	0.109
U-235	7.527E+00	2.193E+01	3.070E+01	0.000E+00	0.245
U-238	3.803E+02	2.717E+02	4.834E+02	0.000E+00	0.787
AM-241	5.418E+00	2.542E+01	3.532E+01	0.000E+00	0.153

A,07L28833-20 ,06/09/2006 16:51,05/26/2006 16:00, 3.004E+00,WGL28833-20 EX
 B,07L28833-20 ,LIBD ,06/07/2006 09:32,073L082504
 C,BE-7 ,NO , 1.504E+00, 2.491E+01, 4.067E+01,, 0.037
 C,K-40 ,NO , 4.822E+00, 3.458E+01, 6.116E+01,, 0.079
 C,CR-51 ,NO , -3.936E+01, 2.845E+01, 4.502E+01,, -0.874
 C,MN-54 ,NO , 1.784E+00, 2.518E+00, 4.328E+00,, 0.412
 C,CO-57 ,NO , -8.443E-01, 2.393E+00, 3.872E+00,, -0.218
 C,CO-58 ,NO , -7.301E-04, 2.614E+00, 4.327E+00,, 0.000
 C,FE-59 ,NO , 1.200E+00, 5.533E+00, 9.299E+00,, 0.129
 C,CO-60 ,NO , -5.849E-01, 2.522E+00, 4.039E+00,, -0.145
 C,ZN-65 ,NO , -1.335E+00, 5.277E+00, 8.583E+00,, -0.156
 C,SE-75 ,NO , -3.694E+00, 3.545E+00, 5.580E+00,, -0.662
 C,SR-85 ,NO , 1.910E+01, 3.320E+00, 6.518E+00,, 2.930
 C,Y-88 ,NO , -1.462E+00, 2.865E+00, 4.512E+00,, -0.324
 C,NB-94 ,NO , -6.452E-01, 2.488E+00, 4.005E+00,, -0.161
 C,NB-95 ,NO , 1.303E+00, 2.770E+00, 4.720E+00,, 0.276
 C,ZR-95 ,NO , -4.256E+00, 4.807E+00, 7.368E+00,, -0.578
 C,MO-99 ,NO , -5.494E+02, 6.306E+02, 9.730E+02,, -0.565
 C,RU-103 ,NO , 2.063E+00, 3.200E+00, 5.352E+00,, 0.386
 C,RU-106 ,NO , -9.765E+00, 2.394E+01, 3.856E+01,, -0.253
 C,AG-110m ,NO , 6.319E-01, 2.478E+00, 4.117E+00,, 0.153
 C,SN-113 ,NO , -6.138E-01, 3.367E+00, 5.503E+00,, -0.112
 C,SB-124 ,NO , -8.298E+00, 3.905E+00, 4.644E+00,, -1.787
 C,SB-125 ,NO , -5.714E+00, 7.191E+00, 1.137E+01,, -0.502
 C,TE-129M ,NO , -1.506E+01, 3.546E+01, 5.670E+01,, -0.266
 C,I-131 ,NO , -3.223E+00, 7.792E+00, 1.267E+01,, -0.254
 C,BA-133 ,NO , 2.105E+00, 3.446E+00, 5.832E+00,, 0.361
 C,CS-134 ,NO , -1.154E+00, 2.821E+00, 4.569E+00,, -0.253
 C,CS-136 ,NO , -1.290E+00, 4.701E+00, 7.645E+00,, -0.169
 C,CS-137 ,NO , -8.162E-01, 2.656E+00, 4.278E+00,, -0.191
 C,CE-139 ,NO , 5.681E-01, 2.413E+00, 4.052E+00,, 0.140
 C,BA-140 ,NO , 1.177E+01, 1.754E+01, 3.006E+01,, 0.392
 C,LA-140 ,NO , -3.672E+00, 6.173E+00, 9.634E+00,, -0.381
 C,CE-141 ,NO , 1.073E-01, 6.174E+00, 8.521E+00,, 0.013
 C,CE-144 ,NO , 3.818E+00, 2.197E+01, 3.066E+01,, 0.125
 C,EU-152 ,NO , -1.107E+01, 8.139E+00, 1.285E+01,, -0.861
 C,EU-154 ,NO , -8.965E-01, 4.879E+00, 7.930E+00,, -0.113
 C,RA-226 ,NO , -7.153E+00, 6.253E+01, 1.029E+02,, -0.070
 C,AC-228 ,NO , 1.742E+00, 9.904E+00, 1.604E+01,, 0.109
 C,TH-228 ,NO , 1.512E+00, 4.975E+00, 8.206E+00,, 0.184
 C,TH-232 ,NO , 1.734E+00, 9.859E+00, 1.597E+01,, 0.109
 C,U-235 ,NO , 7.527E+00, 2.193E+01, 3.070E+01,, 0.245
 C,U-238 ,NO , 3.803E+02, 2.717E+02, 4.834E+02,, 0.787
 C,AM-241 ,NO , 5.418E+00, 2.542E+01, 3.532E+01,, 0.153

Summary of Nuclide Activity
 Sample ID : 23WG4096-3

Page : 2
 Acquisition date : 9-JUN-2006 13:33:50

Total number of lines in spectrum	11	
Number of unidentified lines	10	
Number of lines tentatively identified by NID	1	9.09%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	7.839E+01	7.839E+01	8.355E+01	106.58	
			-----	-----			
		Total Activity :	7.839E+01	7.839E+01			

Grand Total Activity : 7.839E+01 7.839E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 23WG4096-3

Page : 3
Acquisition date : 9-JUN-2006 13:33:50

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	33.81	67	10	1.24	67.94	65	22	5.45E-03	48.7	8.28E-02	
6	35.72	44	96	2.13	71.75	65	22	3.59E-03	****	1.14E-01	
6	38.36	48	174	1.93	77.03	65	22	3.94E-03	****	1.67E-01	
6	40.90	7	192	1.78	82.11	65	22	5.32E-04	****	2.29E-01	
2	63.10	79	385	1.51	126.48	121	17	6.49E-03	****	1.03E+00	
2	66.17	94	402	1.51	132.61	121	17	7.70E-03	79.8	1.15E+00	
0	92.57	32	539	1.08	185.38	181	10	2.59E-03	****	1.94E+00	
0	198.06	70	303	1.02	396.22	392	8	5.71E-03	95.4	2.11E+00	
0	595.32	43	108	1.79	1190.33	1182	14	3.52E-03	****	9.57E-01	
0	608.94	22	71	1.68	1217.55	1213	10	1.82E-03	****	9.41E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	11
Number of unidentified lines	10
Number of lines tentatively identified by NID	1
	9.09%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	7.839E+01	7.839E+01	8.355E+01	106.58	
Total Activity :			7.839E+01	7.839E+01			

Grand Total Activity : 7.839E+01 7.839E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	7.839E+01	8.355E+01	1.302E+02	0.000E+00	0.602

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.621E+00		2.970E+01	5.032E+01	0.000E+00	-0.052

NA-24	-9.422E+00	8.958E+00	Half-Life too short		
K-40	-3.420E+01	4.132E+01	8.278E+01	0.000E+00	-0.413
CR-51	2.026E+01	3.719E+01	6.467E+01	0.000E+00	0.313
MN-54	1.489E+00	2.677E+00	4.842E+00	0.000E+00	0.308
CO-57	-3.032E-01	3.231E+00	5.428E+00	0.000E+00	-0.056
CO-58	-2.066E+00	3.083E+00	5.108E+00	0.000E+00	-0.404
FE-59	9.146E-01	6.093E+00	1.092E+01	0.000E+00	0.084
CO-60	2.721E+00	2.806E+00	5.387E+00	0.000E+00	0.505
ZN-65	5.210E+00	6.495E+00	1.203E+01	0.000E+00	0.433
SE-75	-1.018E+00	4.437E+00	7.542E+00	0.000E+00	-0.135
SR-85	1.819E+01	4.069E+00	7.970E+00	0.000E+00	2.282
Y-88	-7.127E-01	2.910E+00	5.159E+00	0.000E+00	-0.138
NB-94	2.822E-01	2.787E+00	4.866E+00	0.000E+00	0.058
NB-95	5.656E-01	3.294E+00	5.772E+00	0.000E+00	0.098
ZR-95	-2.584E+00	5.852E+00	9.872E+00	0.000E+00	-0.262
MO-99	6.849E+01	7.346E+02	1.286E+03	0.000E+00	0.053
RU-103	1.902E+00	3.786E+00	6.598E+00	0.000E+00	0.288
RU-106	-6.521E+00	2.800E+01	4.809E+01	0.000E+00	-0.136
AG-110m	4.102E+00	2.843E+00	5.358E+00	0.000E+00	0.766
SN-113	-3.025E+00	4.087E+00	6.747E+00	0.000E+00	-0.448
SB-124	2.713E+00	6.847E+00	5.631E+00	0.000E+00	0.482
SB-125	1.545E+00	8.279E+00	1.426E+01	0.000E+00	0.108
TE-129M	-1.379E+01	4.527E+01	7.591E+01	0.000E+00	-0.182
I-131	-2.246E+00	1.028E+01	1.740E+01	0.000E+00	-0.129
BA-133	1.092E+00	4.222E+00	7.275E+00	0.000E+00	0.150
CS-134	4.401E+00	5.170E+00	5.815E+00	0.000E+00	0.757
CS-136	8.412E-01	5.486E+00	9.655E+00	0.000E+00	0.087
CS-137	5.283E-02	3.158E+00	5.497E+00	0.000E+00	0.010
CE-139	-1.571E-01	3.402E+00	5.687E+00	0.000E+00	-0.028
BA-140	-1.966E+00	2.281E+01	3.857E+01	0.000E+00	-0.051
LA-140	1.605E+00	6.168E+00	1.147E+01	0.000E+00	0.140
CE-141	8.202E-01	7.312E+00	1.230E+01	0.000E+00	0.067
CE-144	2.407E+00	2.534E+01	4.267E+01	0.000E+00	0.056
EU-152	-1.958E-01	1.002E+01	1.706E+01	0.000E+00	-0.011
EU-154	-2.373E+00	6.586E+00	1.099E+01	0.000E+00	-0.216
AC-228	9.368E+00	1.149E+01	1.973E+01	0.000E+00	0.475
TH-228	4.261E+00	6.372E+00	1.054E+01	0.000E+00	0.404
TH-232	9.325E+00	1.144E+01	1.964E+01	0.000E+00	0.475
U-235	-4.890E+00	2.598E+01	4.221E+01	0.000E+00	-0.116
U-238	1.114E+02	3.340E+02	5.813E+02	0.000E+00	0.192
AM-241	2.852E+01	2.072E+01	3.067E+01	0.000E+00	0.930

A,23WG4096-3	,06/09/2006	16:58,05/26/2006	11:02,	3.003E+00,WG4096-3	WG EX
B,23WG4096-3	,LIBD	,06/01/2006	10:14,	233L082404	
C,RA-226	,YES,	7.839E+01,	8.355E+01,	1.302E+02,,	0.602
C,BE-7	,NO ,	-2.621E+00,	2.970E+01,	5.032E+01,,	-0.052
C,K-40	,NO ,	-3.420E+01,	4.132E+01,	8.278E+01,,	-0.413
C,CR-51	,NO ,	2.026E+01,	3.719E+01,	6.467E+01,,	0.313
C,MN-54	,NO ,	1.489E+00,	2.677E+00,	4.842E+00,,	0.308
C,CO-57	,NO ,	-3.032E-01,	3.231E+00,	5.428E+00,,	-0.056
C,CO-58	,NO ,	-2.066E+00,	3.083E+00,	5.108E+00,,	-0.404
C,FE-59	,NO ,	9.146E-01,	6.093E+00,	1.092E+01,,	0.084
C,CO-60	,NO ,	2.721E+00,	2.806E+00,	5.387E+00,,	0.505
C,ZN-65	,NO ,	5.210E+00,	6.495E+00,	1.203E+01,,	0.433
C,SE-75	,NO ,	-1.018E+00,	4.437E+00,	7.542E+00,,	-0.135
C,SR-85	,NO ,	1.819E+01,	4.069E+00,	7.970E+00,,	2.282
C,Y-88	,NO ,	-7.127E-01,	2.910E+00,	5.159E+00,,	-0.138
C,NB-94	,NO ,	2.822E-01,	2.787E+00,	4.866E+00,,	0.058
C,NB-95	,NO ,	5.656E-01,	3.294E+00,	5.772E+00,,	0.098
C,ZR-95	,NO ,	-2.584E+00,	5.852E+00,	9.872E+00,,	-0.262
C,MO-99	,NO ,	6.849E+01,	7.346E+02,	1.286E+03,,	0.053
C,RU-103	,NO ,	1.902E+00,	3.786E+00,	6.598E+00,,	0.288
C,RU-106	,NO ,	-6.521E+00,	2.800E+01,	4.809E+01,,	-0.136
C,AG-110m	,NO ,	4.102E+00,	2.843E+00,	5.358E+00,,	0.766
C,SN-113	,NO ,	-3.025E+00,	4.087E+00,	6.747E+00,,	-0.448
C,SB-124	,NO ,	2.713E+00,	6.847E+00,	5.631E+00,,	0.482
C,SB-125	,NO ,	1.545E+00,	8.279E+00,	1.426E+01,,	0.108
C,TE-129M	,NO ,	-1.379E+01,	4.527E+01,	7.591E+01,,	-0.182
C,I-131	,NO ,	-2.246E+00,	1.028E+01,	1.740E+01,,	-0.129
C,BA-133	,NO ,	1.092E+00,	4.222E+00,	7.275E+00,,	0.150
C,CS-134	,NO ,	4.401E+00,	5.170E+00,	5.815E+00,,	0.757
C,CS-136	,NO ,	8.412E-01,	5.486E+00,	9.655E+00,,	0.087
C,CS-137	,NO ,	5.283E-02,	3.158E+00,	5.497E+00,,	0.010
C,CE-139	,NO ,	-1.571E-01,	3.402E+00,	5.687E+00,,	-0.028
C,BA-140	,NO ,	-1.966E+00,	2.281E+01,	3.857E+01,,	-0.051
C,LA-140	,NO ,	1.605E+00,	6.168E+00,	1.147E+01,,	0.140
C,CE-141	,NO ,	8.202E-01,	7.312E+00,	1.230E+01,,	0.067
C,CE-144	,NO ,	2.407E+00,	2.534E+01,	4.267E+01,,	0.056
C,EU-152	,NO ,	-1.958E-01,	1.002E+01,	1.706E+01,,	-0.011
C,EU-154	,NO ,	-2.373E+00,	6.586E+00,	1.099E+01,,	-0.216
C,AC-228	,NO ,	9.368E+00,	1.149E+01,	1.973E+01,,	0.475
C,TH-228	,NO ,	4.261E+00,	6.372E+00,	1.054E+01,,	0.404
C,TH-232	,NO ,	9.325E+00,	1.144E+01,	1.964E+01,,	0.475
C,U-235	,NO ,	-4.890E+00,	2.598E+01,	4.221E+01,,	-0.116
C,U-238	,NO ,	1.114E+02,	3.340E+02,	5.813E+02,,	0.192
C,AM-241	,NO ,	2.852E+01,	2.072E+01,	3.067E+01,,	0.930



2508 Quality Lane
Knoxville, TN 37931
865-690-6819 (Phone)

Work Order #: L29109

Exelon

July 6, 2006



Kathy Shaw
 Conestoga-Rovers & Associates
 45 Farmington Valley Road
 Plainville CT 06062

Case Narrative - L29109
EX001-3ESPZION-06

07/06/2006 15:27

Sample Receipt

The following samples were received on June 30, 2006 in good condition, unless otherwise noted.

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)
GW-062806-PG-01	L29109-1	
GW-062806-PG-02	L29109-2	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
H-3 (DIST)	TBE-2010	



**Case Narrative - L29109
EX001-3ESPZION-06**

07/06/2006 15:27

H-3

Quality Control

Quality control samples were analyzed as WG4198.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

H-3 (DIST)

Quality Control

Quality control samples were analyzed as WG4198.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

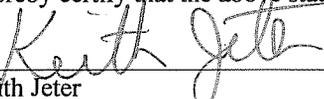
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
GW-062806-PG-01	L29109-1	WG4198-3

Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Sample Receipt Summary

Teledyne Brown Engineering
Sample Receipt Verification/Variance Report

06/30/06 11:35

SR #: SR09163

Client: Exelon

Project #: EX001-3ESPZION-06

LIMS #: L29109

Initiated By: PMARSHALL				
Init Date: 06/30/06		Receive Date: 06/30/06		
Notification of Variance				
Person Notified:		Contacted By:		
Notify Date:				
Notify Method:				
Notify Comment:				
Client Response				
Person Responding:				
Response Date:				
Response Method:				
Response Comment				
Criteria	Yes	No	NA	Comment
1 Shipping container custody seals present and intact.			NA	
2 Sample container custody seals present and intact.			NA	
3 Sample containers received in good condition	Y			
4 Chain of custody received with samples	Y			
5 All samples listed on chain of custody received	Y			
6 Sample container labels present and legible.	Y			
7 Information on container labels correspond with chain of custody	Y			
8 Sample(s) properly preserved and in appropriate container(s)			NA	
9 Other (Describe)			NA	

Internal Chain of Custody

L29109

L29109-1 WG GW-062806-PG-01

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/30/06
Aliquot	H-3 (DIST)	EJ	07/05/06
Count Room	H-3 (DIST)	KOJ	07/05/06

L29109-2 WG GW-062806-PG-02

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/30/06
Aliquot	H-3 (DIST)	EJ	07/05/06
Count Room	H-3 (DIST)	KOJ	07/05/06

Analytical Results Summary

Report of Analysis
 07/06/06 15:53

L29109

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Athy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
-3 (DIST)	2010	2.20E+02	1.23E+02	1.81E+02	pCi/L		10	ml		07/05/06	60	M	+
Sample ID: GW-062806-PG-01 Matrix: Ground Water (WG) Station: Collect Start: 06/28/2006 10:50 Volume: Description: Collect Stop: Receive Date: 06/30/2006 % Moisture: LIMS Number: L29109-1													
-3 (DIST)	2010	1.44E+02	1.22E+02	1.86E+02	pCi/L		10	ml		07/05/06	60	M	U
Sample ID: GW-062806-PG-02 Matrix: Ground Water (WG) Station: Collect Start: 06/28/2006 12:40 Volume: Description: Collect Stop: Receive Date: 06/30/2006 % Moisture: LIMS Number: L29109-2													
-3 (DIST)	2010	1.44E+02	1.22E+02	1.86E+02	pCi/L		10	ml		07/05/06	60	M	U

lag Values = Compound/Analyte not detected or less than 3 sigma
 = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 * Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 igh = Activity concentration exceeds customer reporting value
 pec = MDC exceeds customer technical specification
 = Low recovery
 = High recovery

bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

QC Results Summary

QC Summary Report

for L29109

7/6/2006 3:31:19PM



H-3

Method Blank Summary

<u>BE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
G4198-1	H-3	WO	07/05/2006 12:32	< 1.730E+00	pCi/Total	U	P

LCS Sample Summary

<u>BE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
G4198-2	H-3	WO	07/05/2006 13:36	5.05E+002	5.000E+02	pCi/Total	99.1	70-130	+	P

Spike ID: 3H-041706-1
 Spike conc: 5.05E+002
 Spike Vol: 1.00E+000

L29109 H-3

Associated Samples for WG4198

<u>SAMPLENUM</u>	<u>CLIENTID</u>
L29109-1	GW-062806-PG-01
L29109-2	GW-062806-PG-02

Positive Result
 Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 < 5 times the MDC are not evaluated
 Nuclide not detected
 Spiking level < 5 times activity
 Pass
 Fail
 Not evaluated

QC Summary Report

for L29109

7/6/2006 3:31:19PM



H-3 (DIST)

Duplicate Summary

<u>BE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range Qualifier</u>	<u>P/F</u>
/G4198-3 29109-1	H-3 (DIST)	WG	07/05/2006 17:04	2.200E+02	<1.890E+02	pCi/L		<30	* NE

Positive Result
 Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 < 5 times the MDC are not evaluated
 Nuclide not detected
 Spiking level < 5 times activity
 Pass
 Fail
 Not evaluated

Raw Data

ork Order: L29053 Customer: Environmental Monitoring and T

uclide: H-3 Project : EN003-3REG-02

Sample ID	Run Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery	Count Date/time	Counter ID	Total counts	Sample dt(min)	Bkg counts	Bkg dt(min)	Eff. Factor	Decay & Ingrowth Factor	Analyst
L29053-1	H-3		10 ml			0		02-jul-06 04:52	LS5	1598	26.66	4.07	135	.162		EJ

06050861-01A
 ctivity: 1.56E+04 * Error: 8.44E+02 MDC: 5.09E+02



2508 Quality Lane
Knoxville, TN 37931
865-690-6819 (Phone)

Work Order #: L29321 R1

Exelon

July 28, 2006

Kathy Shaw
Conestoga-Rovers & Associates
45 Farmington Valley Road
Plainville CT 06062

**Case Narrative - L29321
EX001-3ESPZION-06**

07/28/2006 14:16

Sample Receipt

The following samples were received on July 21, 2006 in good condition, unless otherwise noted.

Revision 1:

Zinc-65 was detected in sample GW-071706-JL-TW-ZN-101 (L29321-2) at slightly above the detection level. The sample was recounted and the Zn-65 did not confirm. The original results should be considered a false positive.

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)
GW-071706-JL-TW-ZN-102	L29321-1	
GW-071706-JL-TW-ZN-101	L29321-2	
GW-071706-JL-TW-ZN-103	L29321-3	
GW-071706-JLTW-ZN-100	L29321-4	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3 (DIST)	TBE-2010	
TOTAL SR	TBE-2018	EPA 905.0

**Case Narrative - L29321
EX001-3ESPZION-06**

07/28/2006 14:16

Gamma Spectroscopy

Client requested confirmation analysis.

Quality Control

Quality control samples were analyzed as WG4249.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
GW-071706-JL-TW-ZN-102	L29321-1	WG4249-1

H-3 (DIST)

Quality Control

Quality control samples were analyzed as WG4251.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
GW-071706-JL-TW-ZN-102	L29321-1	WG4251-3

Case Narrative - L29321
EX001-3ESPZION-06

07/28/2006 14:16

TOTAL SR

Quality Control

Quality control samples were analyzed as WG4253.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

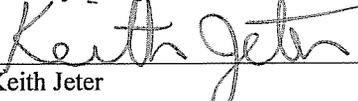
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
GW-071706-JL-TW-ZN-102	L29321-1	WG4253-3

Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Sample Receipt Summary

ACKNOWLEDGEMENT
This is not an invoice

July 24, 2006

Kathy Shaw
Conestoga-Rovers & Associates
45 Farmington Valley Road
Plainville, CT 06062

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on July 21, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by July 24, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely,
Rebecca Charles
Project Manager
(865)934-0379

Project ID: EX001-3ESPZION-06
P.O. #: 00411203
Release #:
Contract#: 00411203
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
GW-071706-JL-TW-ZN-102	L29321-1		07/17/06:0835	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
GW-071706-JL-TW-ZN-101	L29321-2		07/17/06:0935	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
GW-071706-JL-TW-ZN-103	L29321-3		07/17/06:1045	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
GW-071706-JL-TW-ZN-100	L29321-4		07/17/06:1130	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
-----------------------	---------------------------	--------------------	----------------------------	--------------------------

End of document

Internal Chain of Custody

L29321

L29321-1 WG GW-071706-JL-TW-ZN-102

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/21/06
Aliquot	GELI	DW	07/21/06
Aliquot	H-3 (DIST)	DW	07/21/06
Aliquot	SR-90 (FAST)	LCB	07/21/06
Count Room	GELI	ILL	07/21/06
Count Room	H-3 (DIST)	KOJ	07/21/06
Count Room	SR-90 (FAST)	KOJ	07/24/06

L29321-2 WG GW-071706-JL-TW-ZN-101

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/21/06
Aliquot	GELI	DW	07/21/06
Aliquot	H-3 (DIST)	DW	07/21/06
Aliquot	SR-90 (FAST)	LCB	07/21/06
Count Room	GELI	ILL	07/21/06
Count Room	H-3 (DIST)	KOJ	07/21/06
Count Room	SR-90 (FAST)	KOJ	07/24/06

L29321-2R1 WG GW-071706-JL-TW-ZN-101

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/21/06
Aliquot	GELI	DW	07/25/06
Count Room	GELI	ILL	07/27/06

L29321-3 WG GW-071706-JL-TW-ZN-103

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/21/06
Aliquot	GELI	DW	07/21/06
Aliquot	H-3 (DIST)	DW	07/21/06
Aliquot	SR-90 (FAST)	LCB	07/21/06
Count Room	GELI	ILL	07/21/06
Count Room	H-3 (DIST)	KOJ	07/22/06
Count Room	SR-90 (FAST)	KOJ	07/24/06

L29321-4 WG GW-071706-JL-TW-ZN-100

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/21/06
Aliquot	GELI	DW	07/21/06
Aliquot	H-3 (DIST)	DW	07/21/06
Aliquot	SR-90 (FAST)	LCB	07/21/06
Count Room	GELI	ILL	07/21/06
Count Room	H-3 (DIST)	KOJ	07/22/06
Count Room	SR-90 (FAST)	KOJ	07/24/06

Analytical Results Summary

Report of Analysis
07/28/06 12:31

L29321

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Sample ID: GW-071706-JL-TW-ZN-102		Collect Start: 07/17/2006 08:35		Matrix: Ground Water		(WG)							
Station:		Collect Stop:		Volume:									
Description:		Receive Date: 07/21/2006		% Moisture:									
LIMS Number: L29321-1													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	-5.53E+01	1.07E+02	1.82E+02	pCi/L		10	ml		07/21/06	60	M	U
TOTAL SR	2018	-2.87E-02	5.34E-01	1.12E+00	pCi/L		450	ml	07/17/06 08:35	07/24/06	100	M	U
MN-54	2007	2.87E+00	3.41E+00	5.92E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
CO-58	2007	-2.83E+00	3.10E+00	4.67E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
FE-59	2007	-1.01E-01	7.21E+00	1.18E+01	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
CO-60	2007	-1.83E+00	3.52E+00	5.45E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
ZN-65	2007	5.56E+00	7.71E+00	1.33E+01	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
NB-95	2007	-4.06E-01	3.51E+00	5.73E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
ZR-95	2007	-4.75E+00	5.84E+00	9.03E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
CS-134	2007	4.95E+00	4.60E+00	6.88E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
CS-137	2007	-1.63E-01	3.25E+00	5.28E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
BA-140	2007	8.53E+00	1.34E+01	2.31E+01	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U
LA-140	2007	1.63E+00	4.45E+00	7.61E+00	pCi/L		3182.86	ml	07/17/06 08:35	07/21/06	7866	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

07/28/06 12:31

L29321

Conestoga-Rovers & Associates

EX001-3ESPZION-06



Kathy Shaw

Sample ID: **GW-071706-JL-TW-ZN-101**

Station:

Description:

LIMS Number: L29321-2

Collect Start: 07/17/2006 09:35

Collect Stop:

Receive Date: 07/21/2006

Matrix: Ground Water

Volume:

% Moisture:

(WG)

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	9.15E+01	1.16E+02	1.82E+02	pCi/L		10	ml		07/21/06	60	M	U
TOTAL SR	2018	2.60E-01	5.84E-01	1.16E+00	pCi/L		450	ml	07/17/06 09:35	07/24/06	100	M	U
MN-54	2007	4.88E+00	3.26E+00	6.07E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
MN-54	2007	9.92E-01	1.19E+00	2.01E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
CO-58	2007	5.51E-01	3.15E+00	5.25E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
CO-58	2007	-6.02E-01	1.23E+00	2.01E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
FE-59	2007	5.96E+00	6.49E+00	1.17E+01	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
FE-59	2007	2.85E+00	2.57E+00	4.41E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
CO-60	2007	1.80E+00	3.66E+00	6.55E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
CO-60	2007	5.60E-01	1.20E+00	1.99E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
ZN-65	2007	1.60E+01	5.63E+00	1.04E+01	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	+
ZN-65	2007	4.48E+00	2.53E+00	4.42E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U*
NB-95	2007	-7.53E-01	3.32E+00	5.35E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
NB-95	2007	1.00E+00	1.27E+00	2.10E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
ZR-95	2007	1.77E+00	5.76E+00	9.75E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
ZR-95	2007	-2.30E+00	2.22E+00	3.49E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
CS-134	2007	2.29E+00	7.39E+00	6.09E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
CS-134	2007	5.96E+00	2.51E+00	2.17E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U*
CS-137	2007	1.80E+00	3.65E+00	6.31E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
CS-137	2007	-3.88E-01	1.29E+00	2.10E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
BA-140	2007	3.07E+00	1.45E+01	2.42E+01	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
BA-140	2007	6.17E+00	7.00E+00	1.19E+01	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U
LA-140	2007	2.62E+00	4.98E+00	8.69E+00	pCi/L		3438.68	ml	07/17/06 09:35	07/21/06	8341	Sec	U
LA-140	2007	-1.91E+00	2.34E+00	3.71E+00	pCi/L	R1	3074.94	ml	07/17/06 09:35	07/27/06	62041	Sec	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma, peak identified (gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis
 07/28/06 12:31

L29321

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Sample ID: GW-071706-JL-TW-ZN-103		Collect Start: 07/17/2006 10:45		Matrix: Ground Water		(WG)							
Station:		Collect Stop:		Volume:									
Description:		Receive Date: 07/21/2006		% Moisture:									
LIMS Number: L29321-3													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	6.61E+01	1.15E+02	1.83E+02	pCi/L		10	ml		07/22/06	60	M	U
TOTAL SR	2018	4.01E-01	5.66E-01	1.09E+00	pCi/L		450	ml	07/17/06 10:45	07/24/06	100	M	U
MN-54	2007	4.58E-01	3.42E+00	5.72E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
CO-58	2007	2.22E+00	3.53E+00	6.13E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
FE-59	2007	8.34E-01	6.62E+00	1.11E+01	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
CO-60	2007	1.09E+00	3.54E+00	5.99E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
ZN-65	2007	7.32E+00	9.36E+00	1.43E+01	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
NB-95	2007	-4.22E-01	3.55E+00	5.71E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
ZR-95	2007	1.71E+00	5.80E+00	9.67E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
CS-134	2007	5.48E+00	7.28E+00	6.40E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
CS-137	2007	3.50E-01	3.67E+00	6.04E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
BA-140	2007	-1.67E+00	1.53E+01	2.53E+01	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U
LA-140	2007	-1.12E+00	4.86E+00	7.80E+00	pCi/L		3547.51	ml	07/17/06 10:45	07/21/06	7876	Sec	U

Flag Values

U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis
07/28/06 12:31
L29321

Conestoga-Rovers & Associates
EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	8.66E+01	1.18E+02	1.85E+02	pCi/L		10	ml		07/22/06	60	M	U
TOTAL SR	2018	1.13E+00	6.58E-01	1.15E+00	pCi/L		450	ml	07/17/06 11:30	07/24/06	100	M	U
MN-54	2007	4.14E+00	3.62E+00	6.83E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
CO-58	2007	2.49E-01	3.53E+00	6.22E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
FE-59	2007	-4.75E-01	6.61E+00	1.17E+01	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
CO-60	2007	6.82E-01	3.50E+00	6.36E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
ZN-65	2007	-4.36E-01	7.28E+00	1.29E+01	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
NB-95	2007	2.80E+00	3.60E+00	6.65E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
ZR-95	2007	-4.07E+00	5.94E+00	9.89E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
CS-134	2007	3.73E+00	5.12E+00	7.74E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
CS-137	2007	1.10E+00	3.69E+00	6.64E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
BA-140	2007	-2.45E+00	1.48E+01	2.53E+01	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No
LA-140	2007	4.56E+00	5.01E+00	9.85E+00	pCi/L		3562.61	ml	07/17/06 11:30	07/21/06	7921	Sec	No

Sample ID: **GW-071706-JLTW-ZN-100**
Station: Ground Water
Description: Volume:
LJMS Number: L29321-4 % Moisture:

Collect Start: 07/17/2006 11:30
Collect Stop:
Receive Date: 07/21/2006

Flag Values
U = Compound/Analyte not detected or less than 3 sigma
+ = Activity concentration exceeds MDC and 3 sigma, peak identified (gamma only)
U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
High = Activity concentration exceeds customer reporting value
Spec = MDC exceeds customer technical specification
L = Low recovery
H = High recovery
Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum
Yes = Peak identified in gamma spectrum
**** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

QC Results Summary

QC Summary Report

for L29321

7/28/2006 1:55:18PM



H-3 (DIST)

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>
WG4251-1	H-3 (DIST)	WO	07/21/2006 19:56	< 1.870E+00	pCi/Total	U P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>
WG4251-2	H-3 (DIST)	WO	07/21/2006 21:00	5.05E+002	5.010E+02	pCi/Total	99.3	70-130	+ P

Spike ID: 3H-041706-1
Spike conc: 5.05E+002
Spike Vol: 1.00E+000

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>
WG4251-3 L29321-1	H-3 (DIST)	WG	07/21/2006 21:18	< 1.820E+02	< 1.850E+02	pCi/L		<30	** NE

+ Positive Result
U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
* < 5 times the MDC are not evaluated
** Nuclide not detected
*** Spiking level < 5 times activity
P Pass
F Fail
NE Not evaluated

QC Summary Report

for L29321

7/28/2006 1:55:18PM



TOTAL SR

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG4253-1	TOTAL SR	WO	07/24/2006 14:14	< 5.150E-01	pCi/Total	U	P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG4253-2	TOTAL SR	WO	07/24/2006 14:14	5.84E+001	4.170E+01	pCi/Total	71.4	70-130	+	P

Spike ID: 90SR-011905
 Spike conc: 2.34E+002
 Spike Vol: 2.50E-001

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG4253-3 L29321-1	TOTAL SR	WG	07/24/2006 14:14	< 1.120E+00	< 1.170E+00	pCi/L		<30	**	NE

+ Positive Result
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 * < 5 times the MDC are not evaluated
 ** Nuclide not detected
 *** Spiking level < 5 times activity
 P Pass
 F Fail
 NE Not evaluated

Raw Data

Work Order: L29321 Customer: Exelon

Nuclide: H-3 (DIST) Project: EX001-3ESPZION-06

Sample ID	Run #	Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Factor	Decay & Ingrowth Factor	Analyst
L29321-1		H-3 DIST		10 ml			0		21-jul-06 22:22	LS7	106	60	2.03	60	.212		DW
GW-071706-JL-TW-ZN-102																	
Activity: -5.53E+01 Error: 1.07E+02 MDC: 1.82E+02 *																	
L29321-2		H-3 DIST		10 ml			0		21-jul-06 23:26	LS7	148	60	2.03	60	.212		DW
GW-071706-JL-TW-ZN-101																	
Activity: 9.15E+01 Error: 1.16E+02 MDC: 1.82E+02 *																	
L29321-3		H-3 DIST		10 ml			0		22-jul-06 00:30	LS7	140	60	2.03	60	.212		DW
GW-071706-JL-TW-ZN-103																	
Activity: 6.61E+01 Error: 1.15E+02 MDC: 1.83E+02 *																	
L29321-4		H-3 DIST		10 ml			0		22-jul-06 01:33	LS7	146	60	2.03	60	.208		DW
GW-071706-JL-TW-ZN-100																	
Activity: 8.66E+01 Error: 1.18E+02 MDC: 1.85E+02 *																	

Sec. Review: Analyst: *gw* LIMS: _____

=====

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 21-JUL-2006 16:03:39.47
TBE07 P-10768B HpGe ***** Aquisition Date/Time: 21-JUL-2006 13:40:12.01

LIMS No., Customer Name, Client ID: L29321-1 WG ZION

Sample ID : 07L29321-1 Smple Date: 17-JUL-2006 08:35:00.
Sample Type : WG Geometry : 073L082504
Quantity : 3.18290E+00 L BKGFILE : 07BG070106MT
Start Channel : 40 Energy Tol : 1.50000 Real Time : 0 02:11:07.16
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:11:05.55
MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.15*	61	241	1.37	133.14	7.98E-01	7.76E-03	47.1	6.77E-01
2	1	139.64*	58	167	1.34	280.31	2.36E+00	7.37E-03	40.9	1.33E+00
3	1	352.10*	71	102	1.97	705.66	1.61E+00	9.06E-03	34.0	4.29E+00
4	1	609.10*	68	74	1.59	1220.06	1.09E+00	8.62E-03	31.3	2.17E+00
5	1	912.73*	65	30	1.13	1827.68	8.13E-01	8.23E-03	23.4	4.76E+01
6	1	1461.20*	20	3	2.99	2924.81	5.83E-01	2.53E-03	55.7	7.39E-01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	20	10.67*	5.826E-01	3.459E+01	3.459E+01	111.38

Flag: "*" = Keyline

Summary of Nuclide Activity
Sample ID : 07L29321-1

Page : 2
Acquisition date : 21-JUL-2006 13:40:12

Total number of lines in spectrum 6
Number of unidentified lines 5
Number of lines tentatively identified by NID 1 16.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.459E+01	3.459E+01	3.853E+01	111.38	
			-----	-----			
		Total Activity :	3.459E+01	3.459E+01			

Grand Total Activity : 3.459E+01 3.459E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.15	61	241	1.37	133.14	130	8	7.76E-03	94.3	7.98E-01	
1	139.64	58	167	1.34	280.31	277	7	7.37E-03	81.7	2.36E+00	
1	352.10	71	102	1.97	705.66	700	12	9.06E-03	68.0	1.61E+00	
1	609.10	68	74	1.59	1220.06	1215	13	8.62E-03	62.5	1.09E+00	
1	912.73	65	30	1.13	1827.68	1821	18	8.23E-03	46.9	8.13E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 6
 Number of unidentified lines 5
 Number of lines tentatively identified by NID 1 16.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.459E+01	3.459E+01	3.853E+01	111.38	
Total Activity :			3.459E+01	3.459E+01			

Grand Total Activity : 3.459E+01 3.459E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.459E+01	3.853E+01	6.680E+01	0.000E+00	0.518

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	3.532E+00		2.821E+01	4.628E+01	0.000E+00	0.076
NA-24	-2.351E+02		3.645E+02	5.504E+02	0.000E+00	-0.427
CR-51	-9.525E+00		2.891E+01	4.628E+01	0.000E+00	-0.206
MN-54	2.869E+00		3.407E+00	5.917E+00	0.000E+00	0.485
CO-57	-1.348E+00		2.931E+00	4.633E+00	0.000E+00	-0.291
CO-58	-2.832E+00		3.095E+00	4.672E+00	0.000E+00	-0.606

FE-59	-1.009E-01	7.211E+00	1.176E+01	0.000E+00	-0.009
CO-60	-1.831E+00	3.522E+00	5.454E+00	0.000E+00	-0.336
ZN-65	5.563E+00	7.707E+00	1.328E+01	0.000E+00	0.419
SE-75	-6.344E-01	4.154E+00	6.810E+00	0.000E+00	-0.093
SR-85	1.922E+01	3.898E+00	7.799E+00	0.000E+00	2.465
Y-88	-1.555E+00	3.864E+00	6.058E+00	0.000E+00	-0.257
NB-94	-2.822E+00	3.003E+00	4.642E+00	0.000E+00	-0.608
NB-95	-4.063E-01	3.508E+00	5.734E+00	0.000E+00	-0.071
ZR-95	-4.750E+00	5.840E+00	9.033E+00	0.000E+00	-0.526
MO-99	-2.790E+01	7.023E+01	1.127E+02	0.000E+00	-0.248
RU-103	-1.263E+00	3.464E+00	5.492E+00	0.000E+00	-0.230
RU-106	1.343E+01	3.101E+01	5.031E+01	0.000E+00	0.267
AG-110m	3.899E-01	2.931E+00	4.826E+00	0.000E+00	0.081
SN-113	-3.971E+00	3.993E+00	6.221E+00	0.000E+00	-0.638
SB-124	-3.503E+00	4.301E+00	5.490E+00	0.000E+00	-0.638
SB-125	-6.151E+00	8.935E+00	1.406E+01	0.000E+00	-0.438
TE-129M	-1.242E+01	3.800E+01	6.078E+01	0.000E+00	-0.204
I-131	2.386E+00	4.375E+00	7.479E+00	0.000E+00	0.319
BA-133	9.312E+00	5.146E+00	8.194E+00	0.000E+00	1.136
CS-134	4.945E+00	4.597E+00	6.883E+00	0.000E+00	0.718
CS-136	3.154E+00	3.495E+00	6.172E+00	0.000E+00	0.511
CS-137	-1.634E-01	3.253E+00	5.277E+00	0.000E+00	-0.031
CE-139	1.113E+00	2.947E+00	4.921E+00	0.000E+00	0.226
BA-140	8.530E+00	1.338E+01	2.308E+01	0.000E+00	0.370
LA-140	1.625E+00	4.451E+00	7.605E+00	0.000E+00	0.214
CE-141	2.256E+00	6.300E+00	9.137E+00	0.000E+00	0.247
CE-144	1.974E+00	2.602E+01	3.728E+01	0.000E+00	0.053
EU-152	5.447E+00	1.182E+01	1.677E+01	0.000E+00	0.325
EU-154	-5.263E+00	6.237E+00	9.693E+00	0.000E+00	-0.543
RA-226	-9.488E+00	7.784E+01	1.283E+02	0.000E+00	-0.074
AC-228	3.408E+00	1.464E+01	2.181E+01	0.000E+00	0.156
TH-228	4.661E+00	5.924E+00	1.046E+01	0.000E+00	0.445
TH-232	3.403E+00	1.462E+01	2.178E+01	0.000E+00	0.156
U-235	1.445E+01	2.614E+01	3.835E+01	0.000E+00	0.377
U-238	-2.740E+02	3.449E+02	5.260E+02	0.000E+00	-0.521
AM-241	-2.229E+01	2.916E+01	4.359E+01	0.000E+00	-0.511

A,07L29321-1	,07/21/2006 16:03,07/17/2006 08:35,	3.183E+00,L29321-1 WG ZI
B,07L29321-1	,LIBD	,07/21/2006 09:34,073L082504
C,K-40	,YES,	3.459E+01, 3.853E+01, 6.680E+01,, 0.518
C,BE-7	,NO ,	3.532E+00, 2.821E+01, 4.628E+01,, 0.076
C,NA-24	,NO ,	-2.351E+02, 3.645E+02, 5.504E+02,, -0.427
C,CR-51	,NO ,	-9.525E+00, 2.891E+01, 4.628E+01,, -0.206
C,MN-54	,NO ,	2.869E+00, 3.407E+00, 5.917E+00,, 0.485
C,CO-57	,NO ,	-1.348E+00, 2.931E+00, 4.633E+00,, -0.291
C,CO-58	,NO ,	-2.832E+00, 3.095E+00, 4.672E+00,, -0.606
C,FE-59	,NO ,	-1.009E-01, 7.211E+00, 1.176E+01,, -0.009
C,CO-60	,NO ,	-1.831E+00, 3.522E+00, 5.454E+00,, -0.336
C,ZN-65	,NO ,	5.563E+00, 7.707E+00, 1.328E+01,, 0.419
C,SE-75	,NO ,	-6.344E-01, 4.154E+00, 6.810E+00,, -0.093
C,SR-85	,NO ,	1.922E+01, 3.898E+00, 7.799E+00,, 2.465
C,Y-88	,NO ,	-1.555E+00, 3.864E+00, 6.058E+00,, -0.257
C,NB-94	,NO ,	-2.822E+00, 3.003E+00, 4.642E+00,, -0.608
C,NB-95	,NO ,	-4.063E-01, 3.508E+00, 5.734E+00,, -0.071
C,ZR-95	,NO ,	-4.750E+00, 5.840E+00, 9.033E+00,, -0.526
C,MO-99	,NO ,	-2.790E+01, 7.023E+01, 1.127E+02,, -0.248
C,RU-103	,NO ,	-1.263E+00, 3.464E+00, 5.492E+00,, -0.230
C,RU-106	,NO ,	1.343E+01, 3.101E+01, 5.031E+01,, 0.267
C,AG-110m	,NO ,	3.899E-01, 2.931E+00, 4.826E+00,, 0.081
C,SN-113	,NO ,	-3.971E+00, 3.993E+00, 6.221E+00,, -0.638
C,SB-124	,NO ,	-3.503E+00, 4.301E+00, 5.490E+00,, -0.638
C,SB-125	,NO ,	-6.151E+00, 8.935E+00, 1.406E+01,, -0.438
C,TE-129M	,NO ,	-1.242E+01, 3.800E+01, 6.078E+01,, -0.204
C,I-131	,NO ,	2.386E+00, 4.375E+00, 7.479E+00,, 0.319
C,BA-133	,NO ,	9.312E+00, 5.146E+00, 8.194E+00,, 1.136
C,CS-134	,NO ,	4.945E+00, 4.597E+00, 6.883E+00,, 0.718
C,CS-136	,NO ,	3.154E+00, 3.495E+00, 6.172E+00,, 0.511
C,CS-137	,NO ,	-1.634E-01, 3.253E+00, 5.277E+00,, -0.031
C,CE-139	,NO ,	1.113E+00, 2.947E+00, 4.921E+00,, 0.226
C,BA-140	,NO ,	8.530E+00, 1.338E+01, 2.308E+01,, 0.370
C,LA-140	,NO ,	1.625E+00, 4.451E+00, 7.605E+00,, 0.214
C,CE-141	,NO ,	2.256E+00, 6.300E+00, 9.137E+00,, 0.247
C,CE-144	,NO ,	1.974E+00, 2.602E+01, 3.728E+01,, 0.053
C,EU-152	,NO ,	5.447E+00, 1.182E+01, 1.677E+01,, 0.325
C,EU-154	,NO ,	-5.263E+00, 6.237E+00, 9.693E+00,, -0.543
C,RA-226	,NO ,	-9.488E+00, 7.784E+01, 1.283E+02,, -0.074
C,AC-228	,NO ,	3.408E+00, 1.464E+01, 2.181E+01,, 0.156
C,TH-228	,NO ,	4.661E+00, 5.924E+00, 1.046E+01,, 0.445
C,TH-232	,NO ,	3.403E+00, 1.462E+01, 2.178E+01,, 0.156
C,U-235	,NO ,	1.445E+01, 2.614E+01, 3.835E+01,, 0.377
C,U-238	,NO ,	-2.740E+02, 3.449E+02, 5.260E+02,, -0.521
C,AM-241	,NO ,	-2.229E+01, 2.916E+01, 4.359E+01,, -0.511

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 09:15:00.44
TBE07 P-10768B HpGe ***** Aquisition Date/Time: 27-JUL-2006 16:00:40.08

LIMS No., Customer Name, Client ID: L29321-2R1 WG ZION

Sample ID : 07L29321-2R1 Smple Date: 17-JUL-2006 09:35:00.
Sample Type : WG Geometry : 073L082504
Quantity : 3.07490E+00 L BKGFILE : 07BG070106MT
Start Channel : 40 Energy Tol : 1.50000 Real Time : 0 17:14:13.14
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 17:14:00.89
MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	5	66.31*	706	1600	1.37	133.39	8.05E-01	1.14E-02	12.0	3.01E+00
2	1	69.47	206	1244	1.34	139.72	9.31E-01	3.32E-03	27.8	1.05E+00
3	1	139.80*	575	1739	1.63	280.56	2.36E+00	9.26E-03	15.6	2.99E+00
4	1	174.88	237	1353	1.60	350.81	2.34E+00	3.82E-03	27.3	3.81E+00
5	1	198.40*	438	1237	1.05	397.90	2.25E+00	7.05E-03	17.2	1.20E+00
6	1	253.23	157	928	1.47	507.68	1.99E+00	2.53E-03	34.4	7.82E-01
7	1	499.46	126	364	1.76	1000.61	1.25E+00	2.03E-03	27.9	3.45E+00
8	1	596.15	291	562	2.09	1194.14	1.10E+00	4.70E-03	17.8	3.62E+00
9	1	609.27*	107	505	1.50	1220.39	1.09E+00	1.72E-03	56.2	6.38E-01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity

Sample ID : 07L29321-2R1

Acquisition date : 27-JUL-2006 16:00:40

Total number of lines in spectrum	9	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	66.31	706	1600	1.37	133.39	124	14	1.14E-02	23.9	8.05E-01	
1	69.47	206	1244	1.34	139.72	138	6	3.32E-03	55.6	9.31E-01	
1	139.80	575	1739	1.63	280.56	275	10	9.26E-03	31.1	2.36E+00	
1	174.88	237	1353	1.60	350.81	347	8	3.82E-03	54.5	2.34E+00	
1	198.40	438	1237	1.05	397.90	394	8	7.05E-03	34.5	2.25E+00	
1	253.23	157	928	1.47	507.68	505	8	2.53E-03	68.9	1.99E+00	
1	499.46	126	364	1.76	1000.61	997	8	2.03E-03	55.8	1.25E+00	
1	596.15	291	562	2.09	1194.14	1189	13	4.70E-03	35.7	1.10E+00	
1	609.27	107	505	1.50	1220.39	1215	12	1.72E-03	****	1.09E+00	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 9
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 0 0.00%
 **** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.327E+00		1.108E+01	1.815E+01	0.000E+00	0.073
NA-24	-1.351E-01		7.785E-02	Half-Life too short		
K-40	1.318E+01		1.934E+01	3.104E+01	0.000E+00	0.425
CR-51	-1.153E+01		1.280E+01	2.044E+01	0.000E+00	-0.564
MN-54	9.921E-01		1.187E+00	2.008E+00	0.000E+00	0.494
CO-57	-7.565E-01		1.125E+00	1.835E+00	0.000E+00	-0.412
CO-58	-6.020E-01		1.231E+00	2.012E+00	0.000E+00	-0.299
FE-59	2.845E+00		2.573E+00	4.409E+00	0.000E+00	0.645
CO-60	5.603E-01		1.196E+00	1.988E+00	0.000E+00	0.282
ZN-65	4.478E+00		2.534E+00	4.420E+00	0.000E+00	1.013
SE-75	3.000E-02		1.601E+00	2.628E+00	0.000E+00	0.011
SR-85	2.055E+01		1.575E+00	3.085E+00	0.000E+00	6.663
Y-88	-1.062E+00		1.332E+00	2.122E+00	0.000E+00	-0.500
NB-94	3.461E-01		1.185E+00	1.951E+00	0.000E+00	0.177
NB-95	1.002E+00		1.265E+00	2.101E+00	0.000E+00	0.477
ZR-95	-2.300E+00		2.216E+00	3.493E+00	0.000E+00	-0.658
MO-99	-1.987E+01		1.223E+02	1.984E+02	0.000E+00	-0.100
RU-103	1.634E+00		1.408E+00	2.352E+00	0.000E+00	0.695
RU-106	-1.122E+00		1.091E+01	1.794E+01	0.000E+00	-0.063

AG-110m	-5.479E-01	1.179E+00	1.912E+00	0.000E+00	-0.287
SN-113	1.259E+00	1.528E+00	2.566E+00	0.000E+00	0.491
SB-124	2.291E+00	2.745E+00	2.107E+00	0.000E+00	1.087
SB-125	2.061E+00	3.318E+00	5.525E+00	0.000E+00	0.373
TE-129M	1.686E+00	1.596E+01	2.618E+01	0.000E+00	0.064
I-131	-9.018E-01	2.784E+00	4.592E+00	0.000E+00	-0.196
BA-133	2.888E+00	1.633E+00	2.796E+00	0.000E+00	1.033
CS-134	5.962E+00	2.510E+00	2.172E+00	0.000E+00	2.745
CS-136	1.444E+00	1.912E+00	3.235E+00	0.000E+00	0.446
CS-137	-3.877E-01	1.287E+00	2.096E+00	0.000E+00	-0.185
CE-139	7.532E-01	1.187E+00	1.909E+00	0.000E+00	0.395
BA-140	6.169E+00	6.999E+00	1.188E+01	0.000E+00	0.519
LA-140	-1.908E+00	2.340E+00	3.712E+00	0.000E+00	-0.514
CE-141	-9.986E-01	2.963E+00	3.807E+00	0.000E+00	-0.262
CE-144	-9.689E+00	1.024E+01	1.404E+01	0.000E+00	-0.690
EU-152	-1.827E+01	3.767E+00	5.746E+00	0.000E+00	-3.180
EU-154	-8.917E-01	2.314E+00	3.787E+00	0.000E+00	-0.235
RA-226	1.697E+00	3.227E+01	4.761E+01	0.000E+00	0.036
AC-228	1.095E+00	5.789E+00	7.728E+00	0.000E+00	0.142
TH-228	3.003E+00	2.378E+00	3.813E+00	0.000E+00	0.788
TH-232	1.091E+00	5.769E+00	7.701E+00	0.000E+00	0.142
U-235	2.930E+00	1.095E+01	1.427E+01	0.000E+00	0.205
U-238	1.172E+02	1.277E+02	2.147E+02	0.000E+00	0.546
AM-241	4.402E+00	1.187E+01	1.665E+01	0.000E+00	0.264

A,07L29321-2R1	,07/28/2006	09:15,07/17/2006	09:35,	3.075E+00,L29321-2R1	WG
B,07L29321-2R1	,LIBD		,07/24/2006	09:06,073L082504	
C,BE-7	,NO	1.327E+00,	1.108E+01,	1.815E+01,,	0.073
C,K-40	,NO	1.318E+01,	1.934E+01,	3.104E+01,,	0.425
C,CR-51	,NO	-1.153E+01,	1.280E+01,	2.044E+01,,	-0.564
C,MN-54	,NO	9.921E-01,	1.187E+00,	2.008E+00,,	0.494
C,CO-57	,NO	-7.565E-01,	1.125E+00,	1.835E+00,,	-0.412
C,CO-58	,NO	-6.020E-01,	1.231E+00,	2.012E+00,,	-0.299
C,FE-59	,NO	2.845E+00,	2.573E+00,	4.409E+00,,	0.645
C,CO-60	,NO	5.603E-01,	1.196E+00,	1.988E+00,,	0.282
C,ZN-65	,NO	4.478E+00,	2.534E+00,	4.420E+00,,	1.013
C,SE-75	,NO	3.000E-02,	1.601E+00,	2.628E+00,,	0.011
C,SR-85	,NO	2.055E+01,	1.575E+00,	3.085E+00,,	6.663
C,Y-88	,NO	-1.062E+00,	1.332E+00,	2.122E+00,,	-0.500
C,NB-94	,NO	3.461E-01,	1.185E+00,	1.951E+00,,	0.177
C,NB-95	,NO	1.002E+00,	1.265E+00,	2.101E+00,,	0.477
C,ZR-95	,NO	-2.300E+00,	2.216E+00,	3.493E+00,,	-0.658
C,MO-99	,NO	-1.987E+01,	1.223E+02,	1.984E+02,,	-0.100
C,RU-103	,NO	1.634E+00,	1.408E+00,	2.352E+00,,	0.695
C,RU-106	,NO	-1.122E+00,	1.091E+01,	1.794E+01,,	-0.063
C,AG-110m	,NO	-5.479E-01,	1.179E+00,	1.912E+00,,	-0.287
C,SN-113	,NO	1.259E+00,	1.528E+00,	2.566E+00,,	0.491
C,SB-124	,NO	2.291E+00,	2.745E+00,	2.107E+00,,	1.087
C,SB-125	,NO	2.061E+00,	3.318E+00,	5.525E+00,,	0.373
C,TE-129M	,NO	1.686E+00,	1.596E+01,	2.618E+01,,	0.064
C,I-131	,NO	-9.018E-01,	2.784E+00,	4.592E+00,,	-0.196
C,BA-133	,NO	2.888E+00,	1.633E+00,	2.796E+00,,	1.033
C,CS-134	,NO	5.962E+00,	2.510E+00,	2.172E+00,,	2.745
C,CS-136	,NO	1.444E+00,	1.912E+00,	3.235E+00,,	0.446
C,CS-137	,NO	-3.877E-01,	1.287E+00,	2.096E+00,,	-0.185
C,CE-139	,NO	7.532E-01,	1.187E+00,	1.909E+00,,	0.395
C,BA-140	,NO	6.169E+00,	6.999E+00,	1.188E+01,,	0.519
C,LA-140	,NO	-1.908E+00,	2.340E+00,	3.712E+00,,	-0.514
C,CE-141	,NO	-9.986E-01,	2.963E+00,	3.807E+00,,	-0.262
C,CE-144	,NO	-9.689E+00,	1.024E+01,	1.404E+01,,	-0.690
C,EU-152	,NO	-1.827E+01,	3.767E+00,	5.746E+00,,	-3.180
C,EU-154	,NO	-8.917E-01,	2.314E+00,	3.787E+00,,	-0.235
C,RA-226	,NO	1.697E+00,	3.227E+01,	4.761E+01,,	0.036
C,AC-228	,NO	1.095E+00,	5.789E+00,	7.728E+00,,	0.142
C,TH-228	,NO	3.003E+00,	2.378E+00,	3.813E+00,,	0.788
C,TH-232	,NO	1.091E+00,	5.769E+00,	7.701E+00,,	0.142
C,U-235	,NO	2.930E+00,	1.095E+01,	1.427E+01,,	0.205
C,U-238	,NO	1.172E+02,	1.277E+02,	2.147E+02,,	0.546
C,AM-241	,NO	4.402E+00,	1.187E+01,	1.665E+01,,	0.264

Summary of Nuclide Activity

Sample ID : 13L29321-3

Acquisition date : 21-JUL-2006 13:43:20

Total number of lines in spectrum	9	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	63.73	90	472	4.22	127.68	121	16	1.15E-02	****	6.35E-01	
1	198.26	64	206	1.80	396.75	393	9	8.16E-03	86.6	1.90E+00	
1	295.24	33	90	1.32	590.76	587	8	4.23E-03	****	1.52E+00	
1	352.06	52	93	1.84	704.46	700	10	6.55E-03	84.2	1.34E+00	
1	594.98	108	67	5.25	1190.63	1187	15	1.38E-02	36.5	9.12E-01	
1	609.28	23	90	1.58	1219.26	1213	12	2.91E-03	****	8.96E-01	
1	847.96	23	22	5.00	1697.19	1692	13	2.98E-03	****	7.01E-01	
1	1120.14	18	24	1.72	2242.45	2238	8	2.24E-03	****	5.69E-01	
1	1763.69	11	23	5.43	3532.80	3525	15	1.40E-03	****	4.11E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 9
 Number of unidentified lines 9
 Number of lines tentatively identified by NID 0 0.00%
 **** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.139E+01		2.907E+01	4.508E+01	0.000E+00	-0.474
NA-24	-1.077E+02		3.679E+02	5.807E+02	0.000E+00	-0.185
K-40	-4.555E+01		5.008E+01	9.407E+01	0.000E+00	-0.484
CR-51	-2.716E+01		3.065E+01	4.717E+01	0.000E+00	-0.576
MN-54	4.584E-01		3.417E+00	5.722E+00	0.000E+00	0.080
CO-57	1.094E+00		3.181E+00	5.273E+00	0.000E+00	0.207
CO-58	2.216E+00		3.526E+00	6.130E+00	0.000E+00	0.362
FE-59	8.338E-01		6.618E+00	1.112E+01	0.000E+00	0.075
CO-60	1.087E+00		3.538E+00	5.985E+00	0.000E+00	0.182
ZN-65	7.318E+00		9.363E+00	1.434E+01	0.000E+00	0.510
SE-75	-1.784E+00		4.526E+00	7.265E+00	0.000E+00	-0.246
SR-85	1.466E+01		4.377E+00	8.167E+00	0.000E+00	1.794
Y-88	-5.502E-01		3.632E+00	5.784E+00	0.000E+00	-0.095
NB-94	-2.191E+00		3.437E+00	5.357E+00	0.000E+00	-0.409
NB-95	-4.223E-01		3.549E+00	5.711E+00	0.000E+00	-0.074
ZR-95	1.712E+00		5.798E+00	9.665E+00	0.000E+00	0.177
MO-99	5.390E+01		6.928E+01	1.199E+02	0.000E+00	0.449
RU-103	2.703E+00		3.827E+00	6.486E+00	0.000E+00	0.417
RU-106	-1.418E+01		3.244E+01	5.187E+01	0.000E+00	-0.273

AG-110m	-5.290E-01	3.228E+00	5.236E+00	0.000E+00	-0.101
SN-113	8.167E-01	4.503E+00	7.509E+00	0.000E+00	0.109
SB-124	1.061E+00	7.423E+00	5.721E+00	0.000E+00	0.185
SB-125	-2.947E+00	9.317E+00	1.500E+01	0.000E+00	-0.196
TE-129M	3.686E+01	4.326E+01	7.416E+01	0.000E+00	0.497
I-131	-2.688E+00	4.636E+00	7.445E+00	0.000E+00	-0.361
BA-133	4.521E+00	5.230E+00	7.881E+00	0.000E+00	0.574
CS-134	5.482E+00	7.282E+00	6.399E+00	0.000E+00	0.857
CS-136	-1.316E+00	4.074E+00	6.586E+00	0.000E+00	-0.200
CS-137	3.504E-01	3.668E+00	6.043E+00	0.000E+00	0.058
CE-139	1.553E+00	3.443E+00	5.646E+00	0.000E+00	0.275
BA-140	-1.674E+00	1.528E+01	2.528E+01	0.000E+00	-0.066
LA-140	-1.117E+00	4.863E+00	7.795E+00	0.000E+00	-0.143
CE-141	-7.042E-01	6.252E+00	1.011E+01	0.000E+00	-0.070
CE-144	-1.372E+01	2.546E+01	4.067E+01	0.000E+00	-0.337
EU-152	-1.069E+01	1.222E+01	1.739E+01	0.000E+00	-0.614
EU-154	-1.434E-01	6.710E+00	1.097E+01	0.000E+00	-0.013
RA-226	2.467E+01	8.582E+01	1.495E+02	0.000E+00	0.165
AC-228	-4.857E+00	1.393E+01	2.323E+01	0.000E+00	-0.209
TH-228	-5.543E-01	6.446E+00	1.093E+01	0.000E+00	-0.051
TH-232	-4.850E+00	1.391E+01	2.320E+01	0.000E+00	-0.209
U-235	-1.409E+01	2.638E+01	4.206E+01	0.000E+00	-0.335
U-238	2.697E+01	3.982E+02	6.588E+02	0.000E+00	0.041
AM-241	4.753E+01	3.126E+01	4.731E+01	0.000E+00	1.005

A,13L29321-3		,07/21/2006 15:54,07/17/2006 10:45,	3.547E+00,L29321-3 WG ZI
B,13L29321-3		,LIBD	,07/19/2006 10:01,1335L090904
C,BE-7	,NO	, -2.139E+01,	2.907E+01, 4.508E+01,, -0.474
C,NA-24	,NO	, -1.077E+02,	3.679E+02, 5.807E+02,, -0.185
C,K-40	,NO	, -4.555E+01,	5.008E+01, 9.407E+01,, -0.484
C,CR-51	,NO	, -2.716E+01,	3.065E+01, 4.717E+01,, -0.576
C,MN-54	,NO	, 4.584E-01,	3.417E+00, 5.722E+00,, 0.080
C,CO-57	,NO	, 1.094E+00,	3.181E+00, 5.273E+00,, 0.207
C,CO-58	,NO	, 2.216E+00,	3.526E+00, 6.130E+00,, 0.362
C,FE-59	,NO	, 8.338E-01,	6.618E+00, 1.112E+01,, 0.075
C,CO-60	,NO	, 1.087E+00,	3.538E+00, 5.985E+00,, 0.182
C,ZN-65	,NO	, 7.318E+00,	9.363E+00, 1.434E+01,, 0.510
C,SE-75	,NO	, -1.784E+00,	4.526E+00, 7.265E+00,, -0.246
C,SR-85	,NO	, 1.466E+01,	4.377E+00, 8.167E+00,, 1.794
C,Y-88	,NO	, -5.502E-01,	3.632E+00, 5.784E+00,, -0.095
C,NB-94	,NO	, -2.191E+00,	3.437E+00, 5.357E+00,, -0.409
C,NB-95	,NO	, -4.223E-01,	3.549E+00, 5.711E+00,, -0.074
C,ZR-95	,NO	, 1.712E+00,	5.798E+00, 9.665E+00,, 0.177
C,MO-99	,NO	, 5.390E+01,	6.928E+01, 1.199E+02,, 0.449
C,RU-103	,NO	, 2.703E+00,	3.827E+00, 6.486E+00,, 0.417
C,RU-106	,NO	, -1.418E+01,	3.244E+01, 5.187E+01,, -0.273
C,AG-110m	,NO	, -5.290E-01,	3.228E+00, 5.236E+00,, -0.101
C,SN-113	,NO	, 8.167E-01,	4.503E+00, 7.509E+00,, 0.109
C,SB-124	,NO	, 1.061E+00,	7.423E+00, 5.721E+00,, 0.185
C,SB-125	,NO	, -2.947E+00,	9.317E+00, 1.500E+01,, -0.196
C,TE-129M	,NO	, 3.686E+01,	4.326E+01, 7.416E+01,, 0.497
C,I-131	,NO	, -2.688E+00,	4.636E+00, 7.445E+00,, -0.361
C,BA-133	,NO	, 4.521E+00,	5.230E+00, 7.881E+00,, 0.574
C,CS-134	,NO	, 5.482E+00,	7.282E+00, 6.399E+00,, 0.857
C,CS-136	,NO	, -1.316E+00,	4.074E+00, 6.586E+00,, -0.200
C,CS-137	,NO	, 3.504E-01,	3.668E+00, 6.043E+00,, 0.058
C,CE-139	,NO	, 1.553E+00,	3.443E+00, 5.646E+00,, 0.275
C,BA-140	,NO	, -1.674E+00,	1.528E+01, 2.528E+01,, -0.066
C,LA-140	,NO	, -1.117E+00,	4.863E+00, 7.795E+00,, -0.143
C,CE-141	,NO	, -7.042E-01,	6.252E+00, 1.011E+01,, -0.070
C,CE-144	,NO	, -1.372E+01,	2.546E+01, 4.067E+01,, -0.337
C,EU-152	,NO	, -1.069E+01,	1.222E+01, 1.739E+01,, -0.614
C,EU-154	,NO	, -1.434E-01,	6.710E+00, 1.097E+01,, -0.013
C,RA-226	,NO	, 2.467E+01,	8.582E+01, 1.495E+02,, 0.165
C,AC-228	,NO	, -4.857E+00,	1.393E+01, 2.323E+01,, -0.209
C,TH-228	,NO	, -5.543E-01,	6.446E+00, 1.093E+01,, -0.051
C,TH-232	,NO	, -4.850E+00,	1.391E+01, 2.320E+01,, -0.209
C,U-235	,NO	, -1.409E+01,	2.638E+01, 4.206E+01,, -0.335
C,U-238	,NO	, 2.697E+01,	3.982E+02, 6.588E+02,, 0.041
C,AM-241	,NO	, 4.753E+01,	3.126E+01, 4.731E+01,, 1.005

Sec. Review: Analyst: LIMS: _____

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 21-JUL-2006 15:55:45.47
TBE23 03017322 HpGe ***** Aquisition Date/Time: 21-JUL-2006 13:43:22.18

LIMS No., Customer Name, Client ID: L29321-4 WG ZION

Sample ID : 23L29321-4 Smple Date: 17-JUL-2006 11:30:00.
Sample Type : WG Geometry : 2335L090704
Quantity : 3.56260E+00 L BKGFILE : 23BG070106MT
Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 02:12:06.53
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:12:01.06
MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	63.23*	26	215	1.38	126.67	9.39E-01	3.28E-03	98.7	0.00E+00
2	0	185.72*	19	420	1.40	371.36	1.95E+00	2.36E-03	246.9	
3	0	198.49	117	290	1.22	396.87	1.90E+00	1.47E-02	30.9	
4	0	295.18*	59	146	1.57	590.08	1.50E+00	7.39E-03	42.5	
5	0	352.39*	84	145	1.56	704.42	1.32E+00	1.06E-02	33.8	
6	0	609.09*	98	54	1.62	1217.59	8.59E-01	1.24E-02	19.5	
7	0	1460.91*	12	6	2.12	2922.10	4.59E-01	1.57E-03	92.9	
8	0	1764.21*	27	0	2.09	3529.67	4.01E-01	3.39E-03	26.1	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	12	10.67*	4.594E-01	2.425E+01	2.425E+01	185.87
RA-226	186.21	19	3.28*	1.947E+00	2.801E+01	2.801E+01	493.89

Flag: "*" = Keyline

Summary of Nuclide Activity

Sample ID : 23L29321-4

Acquisition date : 21-JUL-2006 13:43:22

Total number of lines in spectrum 8
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 2 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.425E+01	2.425E+01	4.507E+01	185.87	
RA-226	1600.00Y	1.00	2.801E+01	2.801E+01	13.83E+01	493.89	
Total Activity :			5.226E+01	5.226E+01			

Grand Total Activity : 5.226E+01 5.226E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	63.23	26	215	1.38	126.67	124	6	3.28E-03	****	9.39E-01	
0	198.49	117	290	1.22	396.87	391	12	1.47E-02	61.8	1.90E+00	
0	295.18	59	146	1.57	590.08	584	10	7.39E-03	84.9	1.50E+00	
0	352.39	84	145	1.56	704.42	696	14	1.06E-02	67.7	1.32E+00	
0	609.09	98	54	1.62	1217.59	1211	12	1.24E-02	39.0	8.59E-01	
0	1764.21	27	0	2.09	3529.67	3524	13	3.39E-03	52.2	4.01E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 8
 Number of unidentified lines 6
 Number of lines tentatively identified by NID 2 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.425E+01	2.425E+01	4.507E+01	185.87	
RA-226	1600.00Y	1.00	2.801E+01	2.801E+01	13.83E+01	493.89	
Total Activity :			5.226E+01	5.226E+01			

Grand Total Activity : 5.226E+01 5.226E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.425E+01	4.507E+01	5.692E+01	0.000E+00	0.426
RA-226	2.801E+01	1.383E+02	1.615E+02	0.000E+00	0.173

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.218E+01		2.915E+01	4.927E+01	0.000E+00	-0.247
NA-24	-5.503E+01		3.426E+02	6.116E+02	0.000E+00	-0.090
CR-51	-2.468E+01		3.367E+01	5.509E+01	0.000E+00	-0.448

MN-54	4.144E+00	3.620E+00	6.834E+00	0.000E+00	0.606
CO-57	-1.562E+00	3.900E+00	6.476E+00	0.000E+00	-0.241
CO-58	2.493E-01	3.532E+00	6.221E+00	0.000E+00	0.040
FE-59	-4.749E-01	6.608E+00	1.169E+01	0.000E+00	-0.041
CO-60	6.815E-01	3.501E+00	6.355E+00	0.000E+00	0.107
ZN-65	-4.356E-01	7.276E+00	1.285E+01	0.000E+00	-0.034
SE-75	9.380E-01	5.022E+00	8.604E+00	0.000E+00	0.109
SR-85	1.385E+01	4.039E+00	7.985E+00	0.000E+00	1.735
Y-88	-2.825E-01	3.934E+00	7.155E+00	0.000E+00	-0.039
NB-94	-1.787E-01	3.140E+00	5.510E+00	0.000E+00	-0.032
NB-95	2.795E+00	3.602E+00	6.649E+00	0.000E+00	0.420
ZR-95	-4.065E+00	5.939E+00	9.889E+00	0.000E+00	-0.411
MO-99	1.039E+01	6.683E+01	1.195E+02	0.000E+00	0.087
RU-103	1.151E+00	3.666E+00	6.456E+00	0.000E+00	0.178
RU-106	-4.765E+01	3.298E+01	5.060E+01	0.000E+00	-0.942
AG-110m	4.373E-01	3.407E+00	6.054E+00	0.000E+00	0.072
SN-113	1.185E+00	4.510E+00	7.946E+00	0.000E+00	0.149
SB-124	-2.950E+00	4.940E+00	6.716E+00	0.000E+00	-0.439
SB-125	-4.431E+00	9.686E+00	1.640E+01	0.000E+00	-0.270
TE-129M	-1.301E+01	4.312E+01	7.335E+01	0.000E+00	-0.177
I-131	2.659E+00	5.153E+00	8.940E+00	0.000E+00	0.297
BA-133	3.517E+00	6.080E+00	9.033E+00	0.000E+00	0.389
CS-134	3.731E+00	5.117E+00	7.735E+00	0.000E+00	0.482
CS-136	-1.415E+00	4.069E+00	6.941E+00	0.000E+00	-0.204
CS-137	1.096E+00	3.692E+00	6.641E+00	0.000E+00	0.165
CE-139	-1.868E+00	3.927E+00	6.436E+00	0.000E+00	-0.290
BA-140	-2.450E+00	1.477E+01	2.526E+01	0.000E+00	-0.097
LA-140	4.560E+00	5.009E+00	9.845E+00	0.000E+00	0.463
CE-141	-5.713E+00	7.276E+00	1.187E+01	0.000E+00	-0.481
CE-144	-1.658E+01	3.022E+01	4.981E+01	0.000E+00	-0.333
EU-152	-5.254E+00	1.397E+01	1.942E+01	0.000E+00	-0.271
EU-154	1.318E+00	8.072E+00	1.362E+01	0.000E+00	0.097
AC-228	-8.539E+00	1.174E+01	1.970E+01	0.000E+00	-0.434
TH-228	6.994E+00	6.973E+00	1.226E+01	0.000E+00	0.571
TH-232	-8.528E+00	1.172E+01	1.967E+01	0.000E+00	-0.434
U-235	-7.902E+00	3.084E+01	5.083E+01	0.000E+00	-0.155
U-238	-9.627E+01	3.605E+02	6.410E+02	0.000E+00	-0.150
AM-241	-7.768E+00	2.336E+01	3.248E+01	0.000E+00	-0.239

A, 23L29321-4		, 07/21/2006 15:55, 07/17/2006 11:30,		3.563E+00, L29321-4 WG ZI	
B, 23L29321-4		, LIBD		, 07/21/2006 13:20, 2335L090704	
C, K-40	, YES,	2.425E+01,	4.507E+01,	5.692E+01,,	0.426
C, RA-226	, YES,	2.801E+01,	1.383E+02,	1.615E+02,,	0.173
C, BE-7	, NO ,	-1.218E+01,	2.915E+01,	4.927E+01,,	-0.247
C, NA-24	, NO ,	-5.503E+01,	3.426E+02,	6.116E+02,,	-0.090
C, CR-51	, NO ,	-2.468E+01,	3.367E+01,	5.509E+01,,	-0.448
C, MN-54	, NO ,	4.144E+00,	3.620E+00,	6.834E+00,,	0.606
C, CO-57	, NO ,	-1.562E+00,	3.900E+00,	6.476E+00,,	-0.241
C, CO-58	, NO ,	2.493E-01,	3.532E+00,	6.221E+00,,	0.040
C, FE-59	, NO ,	-4.749E-01,	6.608E+00,	1.169E+01,,	-0.041
C, CO-60	, NO ,	6.815E-01,	3.501E+00,	6.355E+00,,	0.107
C, ZN-65	, NO ,	-4.356E-01,	7.276E+00,	1.285E+01,,	-0.034
C, SE-75	, NO ,	9.380E-01,	5.022E+00,	8.604E+00,,	0.109
C, SR-85	, NO ,	1.385E+01,	4.039E+00,	7.985E+00,,	1.735
C, Y-88	, NO ,	-2.825E-01,	3.934E+00,	7.155E+00,,	-0.039
C, NB-94	, NO ,	-1.787E-01,	3.140E+00,	5.510E+00,,	-0.032
C, NB-95	, NO ,	2.795E+00,	3.602E+00,	6.649E+00,,	0.420
C, ZR-95	, NO ,	-4.065E+00,	5.939E+00,	9.889E+00,,	-0.411
C, MO-99	, NO ,	1.039E+01,	6.683E+01,	1.195E+02,,	0.087
C, RU-103	, NO ,	1.151E+00,	3.666E+00,	6.456E+00,,	0.178
C, RU-106	, NO ,	-4.765E+01,	3.298E+01,	5.060E+01,,	-0.942
C, AG-110m	, NO ,	4.373E-01,	3.407E+00,	6.054E+00,,	0.072
C, SN-113	, NO ,	1.185E+00,	4.510E+00,	7.946E+00,,	0.149
C, SB-124	, NO ,	-2.950E+00,	4.940E+00,	6.716E+00,,	-0.439
C, SB-125	, NO ,	-4.431E+00,	9.686E+00,	1.640E+01,,	-0.270
C, TE-129M	, NO ,	-1.301E+01,	4.312E+01,	7.335E+01,,	-0.177
C, I-131	, NO ,	2.659E+00,	5.153E+00,	8.940E+00,,	0.297
C, BA-133	, NO ,	3.517E+00,	6.080E+00,	9.033E+00,,	0.389
C, CS-134	, NO ,	3.731E+00,	5.117E+00,	7.735E+00,,	0.482
C, CS-136	, NO ,	-1.415E+00,	4.069E+00,	6.941E+00,,	-0.204
C, CS-137	, NO ,	1.096E+00,	3.692E+00,	6.641E+00,,	0.165
C, CE-139	, NO ,	-1.868E+00,	3.927E+00,	6.436E+00,,	-0.290
C, BA-140	, NO ,	-2.450E+00,	1.477E+01,	2.526E+01,,	-0.097
C, LA-140	, NO ,	4.560E+00,	5.009E+00,	9.845E+00,,	0.463
C, CE-141	, NO ,	-5.713E+00,	7.276E+00,	1.187E+01,,	-0.481
C, CE-144	, NO ,	-1.658E+01,	3.022E+01,	4.981E+01,,	-0.333
C, EU-152	, NO ,	-5.254E+00,	1.397E+01,	1.942E+01,,	-0.271
C, EU-154	, NO ,	1.318E+00,	8.072E+00,	1.362E+01,,	0.097
C, AC-228	, NO ,	-8.539E+00,	1.174E+01,	1.970E+01,,	-0.434
C, TH-228	, NO ,	6.994E+00,	6.973E+00,	1.226E+01,,	0.571
C, TH-232	, NO ,	-8.528E+00,	1.172E+01,	1.967E+01,,	-0.434
C, U-235	, NO ,	-7.902E+00,	3.084E+01,	5.083E+01,,	-0.155
C, U-238	, NO ,	-9.627E+01,	3.605E+02,	6.410E+02,,	-0.150
C, AM-241	, NO ,	-7.768E+00,	2.336E+01,	3.248E+01,,	-0.239



2508 Quality Lane
Knoxville, TN 37931
865-690-6819 (Phone)

Work Order #: L29402 R1

Exelon

August 1, 2006



Kathy Shaw
Conestoga-Rovers & Associates
45 Farmington Valley Road
Plainville CT 06062

Case Narrative - L29402
EX001-3ESPZION-06

08/01/2006 16:32

Sample Receipt

The following samples were received on July 28, 2006 in good condition, unless otherwise noted.

CRA submitted a revised chain of custody on July 31, 2006 with corrected client IDs.

Revision 1:

CRA submitted a second revised chain of custody on August 1, 2006 with corrected sample IDs. Report is revised to contain corrected sample IDs.

Cross Reference Table

Client ID	Laboratory ID	Station ID(if applicable)
WG-ZN-MW-ZN-10U-072806-MS-003	L29402-1	
WG-ZN-MW-ZN-10U-072806-MS-004	L29402-2	
WG-ZN-MW-ZN-10L-072806-MS-005	L29402-3	
WG-ZN-MW-ZN-11U-072806-TL-001	L29402-4	
WG-ZN-MW-ZN-11L-072806-TL-002	L29402-5	

Analytical Method Cross Reference Table

Radiological Parameter	TBE Knoxville Method	Reference Method
Gamma Spectrometry	TBE-2007	EPA 901.1
H-3 (DIST)	TBE-2010	
TOTAL SR	TBE-2018	EPA 905.0



**TELEDYNE
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company
2508 Quality Lane
Knoxville, TN 37931-3133

**Case Narrative - L29402
EX001-3ESPZION-06**

08/01/2006 16:32

Gamma Spectroscopy

Quality Control

Quality control samples were analyzed as WG4276.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-ZION-MW-ZN-10U-072806-MS-003	L29402-1	WG4276-1

H-3 (DIST)

Quality Control

Quality control samples were analyzed as WG4273.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-ZION-MW-ZN-10U-072806-MS-003	L29402-1	WG4273-3



**Case Narrative - L29402
EX001-3ESPZION-06**

08/01/2006 16:32

TOTAL SR

Quality Control

Quality control samples were analyzed as WG4278.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

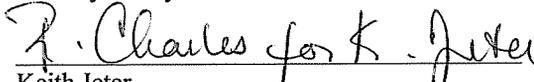
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-QC-MW-QC-1111-072706-NZ-006	L29389-6	WG4278-3

Certification

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.


Keith Jeter
Operations Manager

Sample Receipt Summary

7/31/06

TELEDYNE BROWN ENGINEERING
2508 Quality Lane
Knoxville, TN 37931-3133

ACKNOWLEDGEMENT

This is not an invoice

Kathy Shaw
Conestoga-Rovers & Associates
45 Farmington Valley Road
Plainville, CT 06062

July 31, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on July 28, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by July 31, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely,
Rebecca Charles
Project Manager
(865)934-0379

Project ID: EX001-3ESPZION-06
P.O. #: 00411203
Release #:
Contract#: 00411203
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG-ZION-MW-ZN-10U-072806-MS-	L29402-1		07/28/06:0915	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-ZION-MW-ZN-10U-072806-MS-	L29402-2		07/28/06:1000	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-ZION-MW-ZN-10L-072806-MS-	L29402-3		07/28/06:1125	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-ZION-MW-11-U-072806-TL-00	L29402-4		07/28/06:1112	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-ZION-MW-11-L-072806-TL-00	L29402-5		07/28/06:0945	

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		

End of document

Charles, Rebecca

From: Shaw, Kathy [kshaw@craworld.com]
Sent: Monday, July 31, 2006 4:15 PM
To: Charles, Rebecca
Cc: Larry.Walton@exeloncorp.com; Reid, James
Subject: RE: acknowledgements

Hi Rebecca,

I have attached a revised copy of the Zion COC with explanations on a couple of items. I made sample ID changes to samples 001 and 002, making them the same format as samples 003 - 005. Also, I added Gamma scan to the column with SR 89/90; all of these containers were preserved. Extra non-preserved containers were also collected for 2 samples as I noted on the revised COC, they are not needed. Please revise your sample acknowledgement form for these ID changes and if you can add the truncated numbers to the ends of the samples, that would help too.

I never received a sample acknowledgement form from the samples collected 7/27/06 at Braidwood, please forward.

Thanks,
Kathy

From: Charles, Rebecca [mailto:Rebecca.Charles@tbe.com]
Sent: Monday, July 31, 2006 1:00 PM
To: zigmund.karpa@exeloncorp.com; Czech, Julie; Larry.Walton@exeloncorp.com; Rick.maldonado@exeloncorp.com; Scott.sklenar@exeloncorp.com; Shaw, Kathy; wayne.stotts@exeloncorp.com
Subject: acknowledgements

Rebecca Charles
Teledyne Brown Engineering
Project Manager
(865) 934-0379
(865) 934-0396 (fax)

This email and any of its attachments may contain Teledyne Brown Engineering proprietary information, which is privileged, confidential, or subject to copyright belong to Teledyne Brown Engineering. This e-mail is intended solely for the use of the individual or entity to which it is addressed. If you are not the intended recipient of this e-mail, you are hereby notified that any dissemination, distribution, copying, or action taken in relation to the contents and attachments to this e-mail is strictly prohibited and may be unlawful. If you have received this e-mail in error, please notify the sender immediately and permanently delete the original and any copy and printout of this e-mail. Thank You

8/1/2006

CONESTOGA-ROVERS & ASSOCIATES
 8615 W. Bryn Mawr Avenue
 Chicago, Illinois 60631
 (773)380-9933 phone
 (773)380-6421 fax



SHIPPED TO
 (Laboratory Name): **Teledyne Brown**

REFERENCE NUMBER:
45156-30

PROJECT NAME:
Exelon Zion

CHAIN-OF-CUSTODY RECORD

SAMPLER'S SIGNATURE: *Marcia Sivrek* PRINTED NAME: **Marcia Sivrek**

PARAMETERS:
As, Cd, Cr, Cu, Pb, Se, Zn, Ni, Mn, Fe, Al, Si, Ti, Hg, Ag, Bi, Ba, Be, B, Br, Ca, Co, Cs, K, Li, Mg, Mo, Ni, P, Rb, S, Sb, Sn, Sr, Tl, U, V, W, Y, Zn, Zr

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS	REMARKS
1	7/15/06	7:15	WB-ZION-MW-ZN-11L-072806-MS-003	W	2	As, Cd, Cr, Cu, Pb, Se, Zn, Ni, Mn, Fe, Al, Si, Ti, Hg, Ag, Bi, Ba, Be, B, Br, Ca, Co, Cs, K, Li, Mg, Mo, Ni, P, Rb, S, Sb, Sn, Sr, Tl, U, V, W, Y, Zn, Zr	1-SE refer processed
2	7/15/06	8:00	WB-ZION-MW-ZN-11L-072806-MS-004	W	2	As, Cd, Cr, Cu, Pb, Se, Zn, Ni, Mn, Fe, Al, Si, Ti, Hg, Ag, Bi, Ba, Be, B, Br, Ca, Co, Cs, K, Li, Mg, Mo, Ni, P, Rb, S, Sb, Sn, Sr, Tl, U, V, W, Y, Zn, Zr	1-SE refer processed
3	7/15/06	11:25	WB-ZION-MW-ZN-11L-072806-MS-005	W	3	As, Cd, Cr, Cu, Pb, Se, Zn, Ni, Mn, Fe, Al, Si, Ti, Hg, Ag, Bi, Ba, Be, B, Br, Ca, Co, Cs, K, Li, Mg, Mo, Ni, P, Rb, S, Sb, Sn, Sr, Tl, U, V, W, Y, Zn, Zr	1-SE refer processed
4	7/15/06	11:12	WB-ZION-MW-ZN-11L-072806-TL-001	W	2	As, Cd, Cr, Cu, Pb, Se, Zn, Ni, Mn, Fe, Al, Si, Ti, Hg, Ag, Bi, Ba, Be, B, Br, Ca, Co, Cs, K, Li, Mg, Mo, Ni, P, Rb, S, Sb, Sn, Sr, Tl, U, V, W, Y, Zn, Zr	1-SE refer processed
5	7/15/06	9:15	WB-ZION-MW-ZN-11L-072806-TL-002	W	2	As, Cd, Cr, Cu, Pb, Se, Zn, Ni, Mn, Fe, Al, Si, Ti, Hg, Ag, Bi, Ba, Be, B, Br, Ca, Co, Cs, K, Li, Mg, Mo, Ni, P, Rb, S, Sb, Sn, Sr, Tl, U, V, W, Y, Zn, Zr	1-SE refer processed
TOTAL NUMBER OF CONTAINERS							13

RELINQUISHED BY: ① <i>Marcia Sivrek</i>	DATE: 7/15/06 TIME: 7:15	RECEIVED BY: ② <i>Marcia Sivrek</i>	DATE: 7/28/06 TIME: 12:20
RELINQUISHED BY: ②	DATE: _____ TIME: _____	RECEIVED BY: ③	DATE: _____ TIME: _____
RELINQUISHED BY: ③	DATE: _____ TIME: _____	RECEIVED BY: ④	DATE: _____ TIME: _____

METHOD OF SHIPMENT: AIR BILL No. _____

White - Fully Executed Copy
 Yellow - Receiving Laboratory Copy
 Pink - Shipper Copy
 Goldenrod - Sampler Copy

SAMPLE TEAM:
Marcia Sivrek
Tim LEO

RECEIVED FOR LABORATORY BY:
 DATE: _____ TIME: _____

12466

CONESTOGA-ROVERS & ASSOCIATES
 8615 W. Bryn Mawr Avenue
 Chicago, Illinois 60631
 (773)380-9933 phone
 (773)380-6421 fax

SHIPPED TO
 (Laboratory Name): **Teledyne Brown**
Electronics
Exelon of Zion

REFERENCE NUMBER:
45156-30

PROJECT NAME:
Exelon of Zion

CHAIN-OF-CUSTODY RECORD

SAMPLER'S SIGNATURE: *[Signature]*
 PRINTED NAME: **Marcia Sirek**

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS	REMARKS
1	7/15/06	7:15	WB-ZN-MN-ZN-10L-072806-MS-003	W	2	1 1 1	1-See below preserved 1-See below not preserved
2	7/15/06	8:00	WB-ZN-MN-ZN-10L-072806-MS-004	W	2	1 1 1	
3	7/15/06	11:25	WB-ZN-MN-ZN-10L-072806-MS-005	W	3	1 1 1	
4	7/15/06	11:13	WB-ZN-MN-ZN-11L-072806-TL-001W	W	2	1 1	
5	7/15/06	9:45	WB-ZN-MN-ZN-11L-072806-TL-002W	W	2	1 1	
			revision: 7/21/06 KMJ				
			revision II: 8/1/06 KMJ				
			Zion → ZN in Sample ID				

TOTAL NUMBER OF CONTAINERS: **13**

RELINQUISHED BY: <i>[Signature]</i>	DATE: 7/15/06	RECEIVED BY: <i>[Signature]</i>	DATE: 7/26/06
TIME: 7:15	TIME: 12:20	TIME: 12:20	TIME: 12:20
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
TIME:	TIME:	TIME:	TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
TIME:	TIME:	TIME:	TIME:

AIR BILL No. **12466**

METHOD OF SHIPMENT:
 White - Fully Executed Copy
 Yellow - Receiving Laboratory Copy
 Pink - Shipper Copy
 Goldenrod - Sampler Copy

SAMPLE TEAM:
MARCIA SIREK
TRACY LEO

RECEIVED FOR LABORATORY BY:
 DATE: TIME:

Charles, Rebecca

From: Shaw, Kathy [kshaw@croworld.com]
Sent: Tuesday, August 01, 2006 4:02 PM
To: Charles, Rebecca
Cc: Larry.Walton@exeloncorp.com; Reid, James; Cameron, Mary; Soutter, Doug; Filing
Subject: Zion COC revII

Hi Rebecca,

I have another revision of the Zion COC revised yesterday. Our database can only accept 30 characters for sample IDs; so we had to shorten the Zion IDs to accommodate their system. I changed the Zion in the IDs to ZN, please make these changes in your LIMs system.

Thank you,

Kathy Shaw - Chemist

Conestoga-Rovers & Associates
45 Farmington Valley Drive
Plainville, Connecticut 06062
PH 860 747-1800
Fax 860 747-1900
CRAWORLD.COM

Internal Chain of Custody

08/01/06

Teledyne Brown Engineering
Internal Chain of Custody
Supplemental Sheet

L29402

L29402-1 WG WG-ZN-MW-ZN-10U-072806-MS-003

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	KOJ	07/30/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

L29402-2 WG WG-ZN-MW-ZN-10U-072806-MS-004

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	KOJ	07/30/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

L29402-3 WG WG-ZN-MW-ZN-10L-072806-MS-005

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	KOJ	07/30/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

L29402-4 WG WG-ZN-MW-ZN-11U-072806-TL-001

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	KOJ	07/30/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

L29402-5 WG WG-ZN-MW-ZN-11L-072806-TL-002

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	07/28/06
Aliquot	GELI	DW	07/29/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Aliquot	H-3 (DIST)	EJ	07/31/06
Count Room	GELI	KOJ	07/30/06

08/01/06

Teledyne Brown Engineering
Internal Chain of Custody
Supplemental Sheet

L29402

L29402-5	WG	WG-ZN-MW-ZN-11L-072806-TL-002		
Count Room	H-3 (DIST)		KOJ	08/01/06
Count Room	SR-90 (FAST)		KOJ	07/31/06

Analytical Results Summary

Report of Analysis
 08/01/06 16:02

L29402

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZN-MW-ZN-10U-072806-MS-003** Matrix: Ground Water (WG)
 Station: Collect Start: 07/28/2006 09:15
 Description: Collect Stop: Volume:
 LIMS Number: L29402-1 Receive Date: 07/28/2006 % Moisture:

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	9.34E+01	1.14E+02	1.78E+02	pCi/L		10	ml		07/31/06	60	M	U
TOTAL SR	2018	2.18E-01	7.30E-01	1.50E+00	pCi/L		450	ml	07/28/06 09:15	07/31/06	80	M	U
K-40	2007	8.37E+01	4.23E+01	4.48E+01	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	+
MN-54	2007	2.45E+00	3.11E+00	5.43E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
CO-58	2007	2.37E+00	2.87E+00	5.06E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
FE-59	2007	-1.04E+00	5.88E+00	9.47E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
CO-60	2007	1.96E+00	3.67E+00	6.77E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
ZN-65	2007	3.06E+00	8.12E+00	1.19E+01	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
NB-95	2007	1.31E+00	3.31E+00	5.60E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
ZR-95	2007	7.28E-01	5.80E+00	9.63E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
CS-134	2007	4.97E-01	4.68E+00	5.51E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
CS-137	2007	2.74E+00	3.38E+00	5.96E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
BA-140	2007	1.13E+01	1.23E+01	2.14E+01	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U
LA-140	2007	-3.12E+00	4.01E+00	5.80E+00	pCi/L		3323.85	ml	07/28/06 09:15	07/30/06	9629	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

08/01/06 16:02

L29402

Conestoga-Rovers & Associates

EX001-3ESPZION-06



Kathy Shaw

Sample ID: **WG-ZN-MW-ZN-10U-072806-MS-004**

Station:

Description:

LIMS Number: L29402-2

Collect Start: 07/28/2006 10:00

Collect Stop:

Receive Date: 07/28/2006

Matrix: Ground Water

Volume:

% Moisture:

(WG)

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	8.33E+01	1.16E+02	1.83E+02	pCi/L		10	ml	07/28/06 10:00	07/31/06	60	M	U
TOTAL SR	2018	3.54E-01	6.77E-01	1.35E+00	pCi/L		450	ml	07/28/06 10:00	07/31/06	80	M	U
MN-54	2007	-6.00E-02	2.56E+00	4.20E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
CO-58	2007	-2.52E-01	2.60E+00	4.25E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
FE-59	2007	2.92E+00	4.83E+00	8.31E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
CO-60	2007	-2.97E-02	2.51E+00	4.12E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U*
ZN-65	2007	1.39E+01	6.60E+00	1.08E+01	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
NB-95	2007	3.75E-01	2.60E+00	4.31E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
ZR-95	2007	2.19E+00	5.04E+00	7.60E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
CS-134	2007	1.23E+01	6.29E+00	5.78E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U*
CS-137	2007	6.34E-01	2.77E+00	4.64E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
BA-140	2007	-1.73E+00	1.03E+01	1.66E+01	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U
LA-140	2007	4.14E-02	3.13E+00	5.10E+00	pCi/L		3385.34	ml	07/28/06 10:00	07/30/06	21600	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis
 08/01/06 16:02

L29402

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
Sample ID: WG-ZN-MW-ZN-10L-072806-MS-005 Matrix: Ground Water (WG) Station: Collect Start: 07/28/2006 11:25 Volume: Description: Receive Date: 07/28/2006 % Moisture: LIMS Number: L29402-3													
H-3 (DIST)	2010	1.93E+01	1.13E+02	1.83E+02	pCi/L		10	ml		07/31/06	60	M	U
TOTAL SR	2018	2.74E-01	7.81E-01	1.59E+00	pCi/L		450	ml	07/28/06 11:25	07/31/06	80	M	U
MN-54	2007	6.57E-01	3.25E+00	5.36E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
CO-58	2007	1.28E+00	3.17E+00	5.34E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
FE-59	2007	-1.42E+00	5.74E+00	9.22E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
CO-60	2007	2.24E-01	3.04E+00	5.03E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
ZN-65	2007	1.11E+00	7.73E+00	1.12E+01	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
NB-95	2007	2.64E+00	3.20E+00	5.59E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
ZR-95	2007	3.40E-01	5.68E+00	9.27E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
CS-134	2007	-4.36E-01	3.67E+00	5.09E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
CS-137	2007	6.32E-01	3.55E+00	5.88E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
BA-140	2007	-2.09E+00	1.25E+01	2.04E+01	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U
LA-140	2007	-2.68E+00	4.09E+00	5.91E+00	pCi/L		3372.05	ml	07/28/06 11:25	07/30/06	9600	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)
 U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
 High = Activity concentration exceeds customer reporting value
 Spec = MDC exceeds customer technical specification
 L = Low recovery
 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis
08/01/06 16:02

L29402

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
Sample ID: WG-ZN-MW-ZN-11U-072806-TL-001 Matrix: Ground Water (WG) Station: Collect Start: 07/28/2006 11:12 Volume: % Moisture: Description: Collect Stop: Receive Date: 07/28/2006 LIMS Number: L29402-4													
H-3 (DIST)	2010	-1.70E+01	1.09E+02	1.82E+02	pCi/L		10	ml		07/31/06	60	M	U
TOTAL SR	2018	-2.00E-01	5.80E-01	1.28E+00	pCi/L		450	ml	07/28/06 11:12	07/31/06	80	M	U
MIN-54	2007	-1.97E-01	2.65E+00	4.39E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
CO-58	2007	1.57E-01	2.93E+00	4.77E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
FE-59	2007	1.93E+00	5.02E+00	8.41E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
CO-60	2007	2.99E-01	2.87E+00	4.71E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U*
ZN-65	2007	1.69E+01	7.59E+00	1.20E+01	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
NB-95	2007	1.68E+00	3.33E+00	4.70E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
ZR-95	2007	-2.76E+00	5.20E+00	7.82E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
CS-134	2007	1.81E+01	7.45E+00	6.54E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U*
CS-137	2007	1.21E+00	3.01E+00	5.02E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
BA-140	2007	4.11E+00	1.14E+01	1.91E+01	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U
LA-140	2007	8.18E-02	3.47E+00	5.72E+00	pCi/L		3365.07	ml	07/28/06 11:12	07/30/06	21600	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
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 High = Activity concentration exceeds customer reporting value
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Flag Values
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Bolded text indicates reportable value.

Report of Analysis

08/01/06 16:02

L29402

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Matrix: Ground Water (WG)													
Collect Start: 07/28/2006 09:45													
Collect Stop:													
Receive Date: 07/28/2006													
% Moisture:													
LIMS Number: L29402-5													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
H-3 (DIST)	2010	.00E+00	1.09E+02	1.79E+02	pCi/L		10	ml	07/28/06 09:45	08/01/06	60	M	U
TOTAL SR	2018	-2.50E-01	5.04E-01	1.08E+00	pCi/L		450	ml	07/28/06 09:45	07/31/06	120	M	U
MN-54	2007	1.85E+00	2.83E+00	4.83E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
CO-58	2007	9.43E-01	2.79E+00	4.71E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
FE-59	2007	5.45E+00	5.51E+00	9.71E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
CO-60	2007	2.49E+00	3.06E+00	5.32E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
ZN-65	2007	1.05E+01	7.39E+00	1.16E+01	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
NB-95	2007	1.66E+00	2.93E+00	4.99E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
ZR-95	2007	-4.88E+00	5.20E+00	8.22E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
CS-134	2007	2.00E+01	5.36E+00	6.62E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U*
CS-137	2007	7.30E-01	3.13E+00	5.17E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
BA-140	2007	1.24E+01	1.20E+01	2.06E+01	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U
LA-140	2007	1.71E+00	4.10E+00	6.99E+00	pCi/L		3471.48	ml	07/28/06 09:45	07/30/06	21600	Sec	U

Flag Values
 U = Compound/Analyte not detected or less than 3 sigma
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 H = High recovery

No = Peak not identified in gamma spectrum
 Yes = Peak identified in gamma spectrum
 **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

QC Results Summary

QC Summary Report

for L29402

8/1/2006 4:05:22PM



H-3 (DIST)

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG4273-1	H-3 (DIST)	WO	07/31/2006 17:40	< 1.810E+00	pCi/Total	U	P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG4273-2	H-3 (DIST)	WO	07/31/2006 18:44	5.05E+002	4.760E+02	pCi/Total	94.3	70-130	+	P

Spike ID: 3H-041706-1
 Spike conc: 5.05E+002
 Spike Vol: 1.00E+000

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG4273-3 L29402-1	H-3 (DIST)	WG	07/31/2006 19:03	< 1.780E+02	< 1.820E+02	pCi/L		<30	**	NE

+ Positive Result
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 * < 5 times the MDC are not evaluated
 ** Nuclide not detected
 *** Spiking level < 5 times activity
 P Pass
 F Fail
 NE Not evaluated

QC Summary Report

for L29402

8/1/2006 4:05:22PM



TOTAL SR

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>
WG4278-1	TOTAL SR	WO	07/31/2006 17:05	< 8.500E-01	pCi/Total	U P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>
WG4278-2	TOTAL SR	WO	07/31/2006 17:05	5.84E+001	6.400E+01	pCi/Total	109.6	70-130	+ P

Spike ID: 90SR-011905
 Spike conc: 2.34E+002
 Spike Vol: 2.50E-001

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>
WG4278-3 L29389-6	TOTAL SR	WG	07/31/2006 17:05	< 1.890E+00	< 1.620E+00	pCi/L		<30	** NE

+ Positive Result
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
 * < 5 times the MDC are not evaluated
 ** Nuclide not detected
 *** Spiking level < 5 times activity
 P Pass
 F Fail
 NE Not evaluated

Raw Data

Page: 1

Work Order: L29402	Customer: Exelon															
Nuclide: H-3 (DIST)	Project: EX001-3ESFZION-06															
Sample ID	Run Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery Date/time	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Factor	Ingrowth Factor	Decay & Analyst
L29402-1	H-3 DIST		10 ml			0	31-jul-06 20:06	31-jul-06 20:06	LS7	149	60	2.03	60	.217		EJ
WG-ZN-MW-ZN-10U-072806-MS-003																
Activity: 9.34E+01 Error: 1.14E+02 MDC: 1.78E+02 *																
L29402-2	H-3 DIST		10 ml			0	31-jul-06 21:10	31-jul-06 21:10	LS7	145	60	2.03	60	.211		EJ
WG-ZN-MW-ZN-10U-072806-MS-004																
Activity: 8.33E+01 Error: 1.16E+02 MDC: 1.83E+02 *																
L29402-3	H-3 DIST		10 ml			0	31-jul-06 22:13	31-jul-06 22:13	LS7	127	60	2.03	60	.211		EJ
WG-ZN-MW-ZN-10L-072806-MS-005																
Activity: 1.93E+01 Error: 1.13E+02 MDC: 1.83E+02 *																
L29402-4	H-3 DIST		10 ml			0	31-jul-06 23:17	31-jul-06 23:17	LS7	117	60	2.03	60	.212		EJ
WG-ZN-MW-ZN-11U-072806-TL-001																
Activity: -1.7E+01 Error: 1.09E+02 MDC: 1.82E+02 *																
L29402-5	H-3 DIST		10 ml			0	01-aug-06 00:20	01-aug-06 00:20	LS7	122	60	2.03	60	.216		EJ
WG-ZN-MW-ZN-11L-072806-TL-002																
Activity: 0E+00 Error: 1.09E+02 MDC: 1.79E+02 *																

Work Order: L29402

Customer: Exelon

Nuclide: SR-90 (FAST)

Project: EX001-3ESPZION-06

Sample ID	Run Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Recovery	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Factor	Decay & Ingrowth Factor	Analyst	
L29402-1	TOTAL SR	28-jul-06 09:15	450 ml	31-jul-06 12:30	31-jul-06 12:30	0	86.54	31-jul-06 17:05	X3C	64	80	294	400	.345	1	LCB	
WG-ZN-MW-ZN-10U-072806-MS-003																	
L29402-2	TOTAL SR	28-jul-06 10:00	450 ml	31-jul-06 12:30	31-jul-06 12:30	0	90.93	31-jul-06 17:05	X4A	66	80	284	400	.358	1	LCB	
WG-ZN-MW-ZN-10U-072806-MS-004																	
L29402-3	TOTAL SR	28-jul-06 11:25	450 ml	31-jul-06 12:30	31-jul-06 12:30	0	80.77	31-jul-06 17:05	X4C	66	80	299	400	.35	1	LCB	
WG-ZN-MW-ZN-10L-072806-MS-005																	
L29402-4	TOTAL SR	28-jul-06 11:12	450 ml	31-jul-06 12:30	31-jul-06 12:30	0	106.32	31-jul-06 17:05	X4D	62	80	340	400	.353	1	LCB	
WG-ZN-MW-ZN-11U-072806-TL-001																	
L29402-5	TOTAL SR	28-jul-06 09:45	450 ml	31-jul-06 12:30	31-jul-06 12:30	0	100.27	31-jul-06 20:13	X1A	82	120	308	400	.346	1	LCB	
WG-ZN-MW-ZN-11L-072806-TL-002																	
L29402-6	TOTAL SR	28-jul-06 09:45	450 ml	31-jul-06 12:30	31-jul-06 12:30	0	100.27	31-jul-06 20:13	X1A	82	120	308	400	.346	1	LCB	
WG-ZN-MW-ZN-11L-072806-TL-002																	

Activity: 2.18E-01 Error: 7.3E-01 MDC: 1.5E+00 *
 Activity: 3.54E-01 Error: 6.77E-01 MDC: 1.35E+00 *
 Activity: 2.74E-01 Error: 7.81E-01 MDC: 1.59E+00 *
 Activity: -2E-01 Error: 5.8E-01 MDC: 1.28E+00 *
 Activity: -2.5E-01 Error: 5.04E-01 MDC: 1.08E+00 *

Sec. Review: Analyst: 200 LIMS:

=====

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 1-AUG-2006 09:59:57.87
 TBE04 P-40312B HpGe ***** Aquisition Date/Time: 30-JUL-2006 21:03:58.22

LIMS No., Customer Name, Client ID: WG L29402-1 EX ZION

Sample ID : 04L29402-1 Smple Date: 28-JUL-2006 09:15:00.
 Sample Type : WG Geometry : 0435L090804
 Quantity : 3.32390E+00 L BKGFILE : 04BG072806MT
 Start Channel : 90 Energy Tol : 1.50000 Real Time : 0 02:40:30.62
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:40:28.87
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.08*	72	263	1.49	133.05	6.39E-01	7.51E-03	40.1	3.27E+00
2	1	140.10*	13	279	0.99	281.18	1.82E+00	1.38E-03	249.5	4.38E+00
3	1	185.37*	37	258	2.53	371.77	1.73E+00	3.84E-03	86.1	2.14E+00
4	1	198.15*	84	199	1.59	397.35	1.68E+00	8.76E-03	33.5	4.24E-01
5	3	238.46*	5	96	1.24	478.01	1.52E+00	4.91E-04	364.8	1.47E+00
6	3	241.92	54	172	1.33	484.93	1.51E+00	5.60E-03	43.0	
7	1	295.15*	79	166	1.15	591.43	1.32E+00	8.19E-03	33.0	8.92E-01
8	1	351.87*	161	134	1.17	704.91	1.17E+00	1.68E-02	17.3	1.62E+00
9	1	595.73	50	46	1.51	1192.77	7.86E-01	5.14E-03	30.7	6.16E-01
10	1	609.15*	136	78	1.60	1219.59	7.73E-01	1.41E-02	16.4	1.62E+00
11	1	768.25	21	29	1.52	1537.83	6.46E-01	2.15E-03	55.0	1.15E+00
12	1	1120.46*	28	38	1.94	2242.12	4.81E-01	2.89E-03	52.4	1.90E+00
13	1	1460.66*	41	3	2.85	2922.16	3.92E-01	4.30E-03	25.3	7.98E-01
14	1	1763.85*	33	3	2.95	3528.06	3.43E-01	3.38E-03	24.3	2.12E-01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	41	10.67*	3.921E-01	8.366E+01	8.366E+01	50.51
RA-226	186.21	37	3.28*	1.728E+00	5.511E+01	5.511E+01	172.16
TH-228	238.63	5	44.60*	1.521E+00	5.886E-01	5.901E-01	729.66
	240.98	54	3.95	1.508E+00	7.649E+01	7.668E+01	86.08
U-235	143.76	-----	10.50*	1.822E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.796E+00	-----	Line Not Found	-----
	185.71	37	54.00	1.728E+00	3.347E+00	3.347E+00	172.16
	205.31	-----	4.70	1.652E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity
 Sample ID : 04L29402-1

Page : 2
 Acquisition date : 30-JUL-2006 21:03:58

Total number of lines in spectrum 14
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 4 28.57%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.366E+01	8.366E+01	4.225E+01	50.51	
RA-226	1600.00Y	1.00	5.511E+01	5.511E+01	9.487E+01	172.16	
TH-228	1.91Y	1.00	5.886E-01	5.901E-01	43.05E-01	729.66	
U-235	7.04E+08Y	1.00	3.347E+00	3.347E+00	5.762E+00	172.16	K
Total Activity :			1.427E+02	1.427E+02			

Grand Total Activity : 1.427E+02 1.427E+02

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
 Sample ID : 04L29402-1

Page : 3
 Acquisition date : 30-JUL-2006 21:03:58

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.08	72	263	1.49	133.05	130	7	7.51E-03	80.2	6.39E-01	
1	140.10	13	279	0.99	281.18	277	10	1.38E-03	****	1.82E+00	
1	198.15	84	199	1.59	397.35	394	10	8.76E-03	67.0	1.68E+00	
1	295.15	79	166	1.15	591.43	587	10	8.19E-03	66.1	1.32E+00	
1	351.87	161	134	1.17	704.91	700	12	1.68E-02	34.7	1.17E+00	
1	595.73	50	46	1.51	1192.77	1188	11	5.14E-03	61.3	7.86E-01	
1	609.15	136	78	1.60	1219.59	1215	12	1.41E-02	32.8	7.73E-01	
1	768.25	21	29	1.52	1537.83	1532	10	2.15E-03	****	6.46E-01	
1	1120.46	28	38	1.94	2242.12	2239	12	2.89E-03	****	4.81E-01	
1	1763.85	33	3	2.95	3528.06	3521	14	3.38E-03	48.6	3.43E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 14
 Number of unidentified lines 10
 Number of lines tentatively identified by NID 4 28.57%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.366E+01	8.366E+01	4.225E+01	50.51	
RA-226	1600.00Y	1.00	5.511E+01	5.511E+01	9.487E+01	172.16	
TH-228	1.91Y	1.00	9.101E-01	9.124E-01	42.96E-01	470.87	
Total Activity :			1.397E+02	1.397E+02			

Grand Total Activity : 1.397E+02 1.397E+02

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.366E+01	4.225E+01	4.482E+01	0.000E+00	1.866
RA-226	5.511E+01	9.487E+01	1.157E+02	0.000E+00	0.476
TH-228	9.124E-01	4.296E+00	1.003E+01	0.000E+00	0.091

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.705E+00		2.491E+01	4.055E+01	0.000E+00	-0.067
NA-24	-3.883E+01		6.565E+01	1.020E+02	0.000E+00	-0.381
CR-51	8.196E+00		2.723E+01	4.486E+01	0.000E+00	0.183
MN-54	2.454E+00		3.109E+00	5.427E+00	0.000E+00	0.452
CO-57	5.269E-02		2.884E+00	4.706E+00	0.000E+00	0.011
CO-58	2.373E+00		2.870E+00	5.062E+00	0.000E+00	0.469
FE-59	-1.040E+00		5.881E+00	9.473E+00	0.000E+00	-0.110
CO-60	1.956E+00		3.666E+00	6.769E+00	0.000E+00	0.289
ZN-65	3.056E+00		8.117E+00	1.189E+01	0.000E+00	0.257
SE-75	-5.072E-01		4.220E+00	6.874E+00	0.000E+00	-0.074
SR-85	8.153E+00		3.896E+00	7.024E+00	0.000E+00	1.161
Y-88	-2.029E-01		3.963E+00	6.514E+00	0.000E+00	-0.031
NB-94	-1.179E+00		3.047E+00	4.874E+00	0.000E+00	-0.242
NB-95	1.308E+00		3.306E+00	5.596E+00	0.000E+00	0.234
ZR-95	7.276E-01		5.804E+00	9.628E+00	0.000E+00	0.076
MO-99	3.002E+01		3.909E+01	6.888E+01	0.000E+00	0.436
RU-103	5.363E-01		3.176E+00	5.259E+00	0.000E+00	0.102
RU-106	1.762E+00		2.731E+01	4.571E+01	0.000E+00	0.039
AG-110m	-1.866E+00		2.981E+00	4.690E+00	0.000E+00	-0.398
SN-113	2.420E+00		4.000E+00	6.881E+00	0.000E+00	0.352
SB-124	3.550E+00		5.321E+00	5.067E+00	0.000E+00	0.701
SB-125	6.787E+00		8.458E+00	1.470E+01	0.000E+00	0.462
TE-129M	1.857E+01		3.352E+01	5.730E+01	0.000E+00	0.324
I-131	-3.511E+00		3.675E+00	5.785E+00	0.000E+00	-0.607
BA-133	2.150E+00		4.709E+00	7.002E+00	0.000E+00	0.307
CS-134	4.965E-01		4.679E+00	5.513E+00	0.000E+00	0.090
CS-136	-6.442E-01		3.021E+00	4.816E+00	0.000E+00	-0.134
CS-137	2.743E+00		3.384E+00	5.955E+00	0.000E+00	0.461
CE-139	-3.099E-01		2.974E+00	4.753E+00	0.000E+00	-0.065
BA-140	1.125E+01		1.230E+01	2.138E+01	0.000E+00	0.526
LA-140	-3.122E+00		4.012E+00	5.797E+00	0.000E+00	-0.539
CE-141	3.592E+00		5.993E+00	8.651E+00	0.000E+00	0.415
CE-144	3.803E+00		2.435E+01	3.749E+01	0.000E+00	0.101
EU-152	-7.308E-01		1.081E+01	1.602E+01	0.000E+00	-0.046
EU-154	-5.304E-01		6.011E+00	9.761E+00	0.000E+00	-0.054
AC-228	-1.107E+01		1.308E+01	2.082E+01	0.000E+00	-0.531
TH-232	-1.106E+01		1.307E+01	2.081E+01	0.000E+00	-0.531
U-235	5.917E+00		2.688E+01	3.798E+01	0.000E+00	0.156
U-238	-1.825E+02		3.479E+02	5.454E+02	0.000E+00	-0.335
AM-241	-5.037E-01		2.773E+01	4.534E+01	0.000E+00	-0.011

A,04L29402-1	,08/01/2006	09:59,07/28/2006	09:15,	3.324E+00,WG	L29402-1 EX
B,04L29402-1	,LIBD		,07/28/2006	09:49,0435L090804	
C,K-40	,YES,	8.366E+01,	4.225E+01,	4.482E+01,,	1.866
C,RA-226	,YES,	5.511E+01,	9.487E+01,	1.157E+02,,	0.476
C,TH-228	,YES,	9.124E-01,	4.296E+00,	1.003E+01,,	0.091
C,BE-7	,NO,	-2.705E+00,	2.491E+01,	4.055E+01,,	-0.067
C,NA-24	,NO,	-3.883E+01,	6.565E+01,	1.020E+02,,	-0.381
C,CR-51	,NO,	8.196E+00,	2.723E+01,	4.486E+01,,	0.183
C,MN-54	,NO,	2.454E+00,	3.109E+00,	5.427E+00,,	0.452
C,CO-57	,NO,	5.269E-02,	2.884E+00,	4.706E+00,,	0.011
C,CO-58	,NO,	2.373E+00,	2.870E+00,	5.062E+00,,	0.469
C,FE-59	,NO,	-1.040E+00,	5.881E+00,	9.473E+00,,	-0.110
C,CO-60	,NO,	1.956E+00,	3.666E+00,	6.769E+00,,	0.289
C,ZN-65	,NO,	3.056E+00,	8.117E+00,	1.189E+01,,	0.257
C,SE-75	,NO,	-5.072E-01,	4.220E+00,	6.874E+00,,	-0.074
C,SR-85	,NO,	8.153E+00,	3.896E+00,	7.024E+00,,	1.161
C,Y-88	,NO,	-2.029E-01,	3.963E+00,	6.514E+00,,	-0.031
C,NB-94	,NO,	-1.179E+00,	3.047E+00,	4.874E+00,,	-0.242
C,NB-95	,NO,	1.308E+00,	3.306E+00,	5.596E+00,,	0.234
C,ZR-95	,NO,	7.276E-01,	5.804E+00,	9.628E+00,,	0.076
C,MO-99	,NO,	3.002E+01,	3.909E+01,	6.888E+01,,	0.436
C,RU-103	,NO,	5.363E-01,	3.176E+00,	5.259E+00,,	0.102
C,RU-106	,NO,	1.762E+00,	2.731E+01,	4.571E+01,,	0.039
C,AG-110m	,NO,	-1.866E+00,	2.981E+00,	4.690E+00,,	-0.398
C,SN-113	,NO,	2.420E+00,	4.000E+00,	6.881E+00,,	0.352
C,SB-124	,NO,	3.550E+00,	5.321E+00,	5.067E+00,,	0.701
C,SB-125	,NO,	6.787E+00,	8.458E+00,	1.470E+01,,	0.462
C,TE-129M	,NO,	1.857E+01,	3.352E+01,	5.730E+01,,	0.324
C,I-131	,NO,	-3.511E+00,	3.675E+00,	5.785E+00,,	-0.607
C,BA-133	,NO,	2.150E+00,	4.709E+00,	7.002E+00,,	0.307
C,CS-134	,NO,	4.965E-01,	4.679E+00,	5.513E+00,,	0.090
C,CS-136	,NO,	-6.442E-01,	3.021E+00,	4.816E+00,,	-0.134
C,CS-137	,NO,	2.743E+00,	3.384E+00,	5.955E+00,,	0.461
C,CE-139	,NO,	-3.099E-01,	2.974E+00,	4.753E+00,,	-0.065
C,BA-140	,NO,	1.125E+01,	1.230E+01,	2.138E+01,,	0.526
C,LA-140	,NO,	-3.122E+00,	4.012E+00,	5.797E+00,,	-0.539
C,CE-141	,NO,	3.592E+00,	5.993E+00,	8.651E+00,,	0.415
C,CE-144	,NO,	3.803E+00,	2.435E+01,	3.749E+01,,	0.101
C,EU-152	,NO,	-7.308E-01,	1.081E+01,	1.602E+01,,	-0.046
C,EU-154	,NO,	-5.304E-01,	6.011E+00,	9.761E+00,,	-0.054
C,AC-228	,NO,	-1.107E+01,	1.308E+01,	2.082E+01,,	-0.531
C,TH-232	,NO,	-1.106E+01,	1.307E+01,	2.081E+01,,	-0.531
C,U-235	,NO,	5.917E+00,	2.688E+01,	3.798E+01,,	0.156
C,U-238	,NO,	-1.825E+02,	3.479E+02,	5.454E+02,,	-0.335
C,AM-241	,NO,	-5.037E-01,	2.773E+01,	4.534E+01,,	-0.011

Summary of Nuclide Activity
 Sample ID : 10L29402-2

Page : 2
 Acquisition date : 30-JUL-2006 21:08:39

Total number of lines in spectrum 18
 Number of unidentified lines 16
 Number of lines tentatively identified by NID 2 11.11%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.317E+01	2.317E+01	3.896E+01	168.18	
TH-228	1.91Y	1.00	7.019E+00	7.037E+00	4.814E+00	68.41	
Total Activity :			3.019E+01	3.020E+01			

Grand Total Activity : 3.019E+01 3.020E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 10L29402-2

Page : 3
Acquisition date : 30-JUL-2006 21:08:39

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.92	203	779	1.38	131.26	128	8	9.40E-03	49.4	6.22E-01	
1	77.34	135	553	1.07	154.12	152	6	6.26E-03	57.7	9.50E-01	
1	85.77	128	1209	3.60	171.00	163	14	5.92E-03	***	1.16E+00	
1	92.86	125	726	1.52	185.20	181	9	5.77E-03	84.9	1.30E+00	
1	139.59	252	894	1.76	278.75	273	11	1.17E-02	47.3	1.68E+00	
1	198.32	113	554	1.51	396.31	392	9	5.25E-03	82.8	1.55E+00	
1	242.05	136	405	1.55	483.84	471	18	6.29E-03	56.4	1.39E+00	
1	295.30	128	480	1.06	590.45	585	11	5.91E-03	70.8	1.21E+00	
1	351.82	359	350	1.33	703.60	698	13	1.66E-02	25.2	1.07E+00	
1	408.71	51	154	3.32	817.48	814	10	2.35E-03	96.0	9.49E-01	
1	595.92	66	163	1.95	1192.25	1186	13	3.05E-03	83.9	7.06E-01	
1	609.32	348	126	1.53	1219.07	1214	13	1.61E-02	18.8	6.94E-01	
1	767.42	52	94	4.08	1535.57	1528	14	2.39E-03	84.7	5.79E-01	
1	1120.29	85	78	2.01	2242.00	2235	17	3.95E-03	53.9	4.33E-01	
1	1239.31	54	80	1.03	2480.26	2470	16	2.49E-03	76.8	4.01E-01	
1	1765.28	40	33	3.15	3533.24	3525	17	1.84E-03	81.8	3.13E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	18
Number of unidentified lines	16
Number of lines tentatively identified by NID	2 11.11%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	Error	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr							
K-40	1.28E+09Y	1.00	2.317E+01	2.317E+01	3.896E+01	168.18					
TH-228	1.91Y	1.00	7.019E+00	7.037E+00	4.814E+00	68.41					
Total Activity :			3.019E+01	3.020E+01							

Grand Total Activity : 3.019E+01 3.020E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.317E+01	3.896E+01	3.825E+01	0.000E+00	0.606
TH-228	7.037E+00	4.814E+00	7.745E+00	0.000E+00	0.909

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.171E+01		2.230E+01	3.500E+01	0.000E+00	-0.620
NA-24	-1.892E+01		4.776E+01	7.607E+01	0.000E+00	-0.249
CR-51	-1.883E+01		2.340E+01	3.784E+01	0.000E+00	-0.498
MN-54	-6.004E-02		2.562E+00	4.198E+00	0.000E+00	-0.014
CO-57	5.674E-01		2.791E+00	4.623E+00	0.000E+00	0.123
CO-58	-2.524E-01		2.600E+00	4.249E+00	0.000E+00	-0.059
FE-59	2.920E+00		4.829E+00	8.306E+00	0.000E+00	0.352
CO-60	-2.967E-02		2.508E+00	4.117E+00	0.000E+00	-0.007
ZN-65	1.386E+01		6.604E+00	1.084E+01	0.000E+00	1.279
SE-75	-1.929E-01		3.489E+00	5.804E+00	0.000E+00	-0.033
SR-85	1.820E+01		3.030E+00	5.835E+00	0.000E+00	3.119
Y-88	-7.384E-01		2.741E+00	4.416E+00	0.000E+00	-0.167
NB-94	-4.360E-01		2.537E+00	4.160E+00	0.000E+00	-0.105
NB-95	3.753E-01		2.598E+00	4.309E+00	0.000E+00	0.087
ZR-95	2.194E+00		5.042E+00	7.602E+00	0.000E+00	0.289
MO-99	3.838E+01		3.693E+01	6.398E+01	0.000E+00	0.600
RU-103	-4.511E-01		2.677E+00	4.339E+00	0.000E+00	-0.104
RU-106	6.299E+00		2.307E+01	3.783E+01	0.000E+00	0.167
AG-110m	-1.590E+00		2.500E+00	4.018E+00	0.000E+00	-0.396
SN-113	6.588E-01		3.488E+00	5.778E+00	0.000E+00	0.114
SB-124	-1.899E+00		6.177E+00	4.182E+00	0.000E+00	-0.454
SB-125	2.600E+00		7.432E+00	1.235E+01	0.000E+00	0.210
TE-129M	-9.026E-01		3.041E+01	4.971E+01	0.000E+00	-0.018
I-131	-1.509E-01		3.204E+00	5.278E+00	0.000E+00	-0.029
BA-133	1.878E+01		4.590E+00	7.501E+00	0.000E+00	2.504
CS-134	1.227E+01		6.294E+00	5.775E+00	0.000E+00	2.125
CS-136	-7.841E-01		2.803E+00	4.531E+00	0.000E+00	-0.173
CS-137	6.339E-01		2.773E+00	4.643E+00	0.000E+00	0.137
CE-139	-4.299E-01		2.742E+00	4.478E+00	0.000E+00	-0.096
BA-140	-1.726E+00		1.029E+01	1.662E+01	0.000E+00	-0.104
LA-140	4.139E-02		3.129E+00	5.100E+00	0.000E+00	0.008
CE-141	9.325E-01		5.823E+00	8.158E+00	0.000E+00	0.114
CE-144	2.812E+00		2.483E+01	3.482E+01	0.000E+00	0.081
EU-152	-2.385E+00		1.009E+01	1.396E+01	0.000E+00	-0.171
EU-154	3.107E+00		5.807E+00	9.677E+00	0.000E+00	0.321
RA-226	-1.887E+00		7.015E+01	1.133E+02	0.000E+00	-0.017
AC-228	-1.226E+00		1.035E+01	1.690E+01	0.000E+00	-0.073
TH-232	-1.225E+00		1.034E+01	1.689E+01	0.000E+00	-0.073
U-235	3.166E+01		2.576E+01	3.719E+01	0.000E+00	0.851
U-238	1.024E+00		2.834E+02	4.613E+02	0.000E+00	0.002
AM-241	2.039E+01		2.819E+01	3.956E+01	0.000E+00	0.515

A,10L29402-2		,07/31/2006 03:08,07/28/2006 10:00,		3.385E+00,WG L29402-2 FX	
B,10L29402-2		,LIBD		,07/28/2006 09:50,1035L091004	
C,K-40	,YES,	2.317E+01,	3.896E+01,	3.825E+01,,	0.606
C,TH-228	,YES,	7.037E+00,	4.814E+00,	7.745E+00,,	0.909
C,BE-7	,NO,	-2.171E+01,	2.230E+01,	3.500E+01,,	-0.620
C,NA-24	,NO,	-1.892E+01,	4.776E+01,	7.607E+01,,	-0.249
C,CR-51	,NO,	-1.883E+01,	2.340E+01,	3.784E+01,,	-0.498
C,MN-54	,NO,	-6.004E-02,	2.562E+00,	4.198E+00,,	-0.014
C,CO-57	,NO,	5.674E-01,	2.791E+00,	4.623E+00,,	0.123
C,CO-58	,NO,	-2.524E-01,	2.600E+00,	4.249E+00,,	-0.059
C,FE-59	,NO,	2.920E+00,	4.829E+00,	8.306E+00,,	0.352
C,CO-60	,NO,	-2.967E-02,	2.508E+00,	4.117E+00,,	-0.007
C,ZN-65	,NO,	1.386E+01,	6.604E+00,	1.084E+01,,	1.279
C,SE-75	,NO,	-1.929E-01,	3.489E+00,	5.804E+00,,	-0.033
C,SR-85	,NO,	1.820E+01,	3.030E+00,	5.835E+00,,	3.119
C,Y-88	,NO,	-7.384E-01,	2.741E+00,	4.416E+00,,	-0.167
C,NB-94	,NO,	-4.360E-01,	2.537E+00,	4.160E+00,,	-0.105
C,NB-95	,NO,	3.753E-01,	2.598E+00,	4.309E+00,,	0.087
C,ZR-95	,NO,	2.194E+00,	5.042E+00,	7.602E+00,,	0.289
C,MO-99	,NO,	3.838E+01,	3.693E+01,	6.398E+01,,	0.600
C,RU-103	,NO,	-4.511E-01,	2.677E+00,	4.339E+00,,	-0.104
C,RU-106	,NO,	6.299E+00,	2.307E+01,	3.783E+01,,	0.167
C,AG-110m	,NO,	-1.590E+00,	2.500E+00,	4.018E+00,,	-0.396
C,SN-113	,NO,	6.588E-01,	3.488E+00,	5.778E+00,,	0.114
C,SB-124	,NO,	-1.899E+00,	6.177E+00,	4.182E+00,,	-0.454
C,SB-125	,NO,	2.600E+00,	7.432E+00,	1.235E+01,,	0.210
C,TE-129M	,NO,	-9.026E-01,	3.041E+01,	4.971E+01,,	-0.018
C,I-131	,NO,	-1.509E-01,	3.204E+00,	5.278E+00,,	-0.029
C,BA-133	,NO,	1.878E+01,	4.590E+00,	7.501E+00,,	2.504
C,CS-134	,NO,	1.227E+01,	6.294E+00,	5.775E+00,,	2.125
C,CS-136	,NO,	-7.841E-01,	2.803E+00,	4.531E+00,,	-0.173
C,CS-137	,NO,	6.339E-01,	2.773E+00,	4.643E+00,,	0.137
C,CE-139	,NO,	-4.299E-01,	2.742E+00,	4.478E+00,,	-0.096
C,BA-140	,NO,	-1.726E+00,	1.029E+01,	1.662E+01,,	-0.104
C,LA-140	,NO,	4.139E-02,	3.129E+00,	5.100E+00,,	0.008
C,CE-141	,NO,	9.325E-01,	5.823E+00,	8.158E+00,,	0.114
C,CE-144	,NO,	2.812E+00,	2.483E+01,	3.482E+01,,	0.081
C,EU-152	,NO,	-2.385E+00,	1.009E+01,	1.396E+01,,	-0.171
C,EU-154	,NO,	3.107E+00,	5.807E+00,	9.677E+00,,	0.321
C,RA-226	,NO,	-1.887E+00,	7.015E+01,	1.133E+02,,	-0.017
C,AC-228	,NO,	-1.226E+00,	1.035E+01,	1.690E+01,,	-0.073
C,TH-232	,NO,	-1.225E+00,	1.034E+01,	1.689E+01,,	-0.073
C,U-235	,NO,	3.166E+01,	2.576E+01,	3.719E+01,,	0.851
C,U-238	,NO,	1.024E+00,	2.834E+02,	4.613E+02,,	0.002
C,AM-241	,NO,	2.039E+01,	2.819E+01,	3.956E+01,,	0.515

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 30-JUL-2006 23:48:57.03
 TBE11 P-20610B HpGe ***** Aquisition Date/Time: 30-JUL-2006 21:08:42.83

LIMS No., Customer Name, Client ID: WG L29402-3 EX ZION

Sample ID : 11L29402-3 Smple Date: 28-JUL-2006 11:25:00.
 Sample Type : WG Geometry : 1135L090204
 Quantity : 3.37210E+00 L BKGFILE : 11BG072806MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 02:40:03.78
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:40:00.00
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	139.80*	69	256	1.20	279.38	1.69E+00	7.22E-03	41.0	
2	0	198.20*	46	238	1.00	396.53	1.57E+00	4.81E-03	65.2	
3	6	238.60*	13	144	1.07	477.56	1.42E+00	1.39E-03	156.1	1.16E+00
4	6	241.89	85	263	2.33	484.16	1.41E+00	8.84E-03	40.9	
5	0	295.02*	97	211	1.35	590.69	1.23E+00	1.01E-02	32.2	
6	0	351.85*	181	133	1.59	704.62	1.08E+00	1.89E-02	15.7	
7	0	582.76*	20	24	1.76	1167.28	7.27E-01	2.06E-03	58.3	
8	0	595.98	43	46	1.35	1193.75	7.14E-01	4.53E-03	32.7	
9	0	609.21*	172	78	1.63	1220.26	7.02E-01	1.79E-02	13.6	
10	0	913.73	100	14	9.07	1829.71	5.12E-01	1.04E-02	14.6	
11	0	1119.93*	37	23	1.99	2241.99	4.37E-01	3.88E-03	32.9	
12	0	1460.57*	14	18	1.84	2922.35	3.54E-01	1.45E-03	89.0	
13	0	1762.75*	40	11	2.86	3525.17	3.04E-01	4.13E-03	26.0	
14	0	1845.57	12	11	0.84	3690.25	2.93E-01	1.25E-03	60.8	
15	0	1938.34	12	1	1.28	3875.11	2.82E-01	1.21E-03	33.7	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	14	10.67*	3.540E-01	3.080E+01	3.080E+01	177.98
TH-228	238.63	13	44.60*	1.421E+00	1.756E+00	1.760E+00	312.10
	240.98	85	3.95	1.409E+00	1.273E+02	1.276E+02	81.83

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 11L29402-3

Acquisition date : 30-JUL-2006 21:08:42

Total number of lines in spectrum	15	
Number of unidentified lines	11	
Number of lines tentatively identified by NID	4	26.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.080E+01	3.080E+01	5.482E+01	177.98	
TH-228	1.91Y	1.00	1.756E+00	1.760E+00	5.494E+00	312.10	
			-----	-----			
		Total Activity :	3.256E+01	3.256E+01			

Grand Total Activity :	3.256E+01	3.256E+01
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Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 11L29402-3

Page : 3
Acquisition date : 30-JUL-2006 21:08:42

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	139.80	69	256	1.20	279.38	276	7	7.22E-03	81.9	1.69E+00	
0	198.20	46	238	1.00	396.53	393	10	4.81E-03	****	1.57E+00	
0	295.02	97	211	1.35	590.69	587	12	1.01E-02	64.5	1.23E+00	
0	351.85	181	133	1.59	704.62	698	13	1.89E-02	31.3	1.08E+00	
0	582.76	20	24	1.76	1167.28	1163	8	2.06E-03	****	7.27E-01	T
0	595.98	43	46	1.35	1193.75	1189	10	4.53E-03	65.3	7.14E-01	
0	609.21	172	78	1.63	1220.26	1216	13	1.79E-02	27.2	7.02E-01	
0	913.73	100	14	9.07	1829.71	1817	28	1.04E-02	29.1	5.12E-01	
0	1119.93	37	23	1.99	2241.99	2235	13	3.88E-03	65.8	4.37E-01	
0	1762.75	40	11	2.86	3525.17	3518	14	4.13E-03	52.0	3.04E-01	
0	1845.57	12	11	0.84	3690.25	3682	11	1.25E-03	****	2.93E-01	
0	1938.34	12	1	1.28	3875.11	3872	6	1.21E-03	67.5	2.82E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 15
Number of unidentified lines 11
Number of lines tentatively identified by NID 4 26.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.080E+01	3.080E+01	5.482E+01	177.98	
TH-228	1.91Y	1.00	2.103E+00	2.108E+00	5.486E+00	260.30	
Total Activity :			3.290E+01	3.291E+01			

Grand Total Activity : 3.290E+01 3.291E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	3.080E+01	5.482E+01	4.437E+01	0.000E+00	0.694
TH-228	2.108E+00	5.486E+00	9.066E+00	0.000E+00	0.232

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.094E+01		2.638E+01	4.496E+01	0.000E+00	0.243
NA-24	1.673E+01		4.654E+01	8.015E+01	0.000E+00	0.209
CR-51	6.869E-01		2.880E+01	4.630E+01	0.000E+00	0.015
MN-54	6.568E-01		3.252E+00	5.357E+00	0.000E+00	0.123
CO-57	-2.455E-01		3.145E+00	5.183E+00	0.000E+00	-0.047
CO-58	1.276E+00		3.174E+00	5.341E+00	0.000E+00	0.239
FE-59	-1.423E+00		5.741E+00	9.224E+00	0.000E+00	-0.154
CO-60	2.243E-01		3.039E+00	5.033E+00	0.000E+00	0.045
ZN-65	1.106E+00		7.728E+00	1.118E+01	0.000E+00	0.099
SE-75	-2.405E+00		4.252E+00	6.660E+00	0.000E+00	-0.361
SR-85	-3.607E+00		4.217E+00	6.657E+00	0.000E+00	-0.542
Y-88	-2.875E-01		4.379E+00	6.316E+00	0.000E+00	-0.046
NB-94	2.813E+00		3.371E+00	5.852E+00	0.000E+00	0.481
NB-95	2.638E+00		3.202E+00	5.590E+00	0.000E+00	0.472
ZR-95	3.399E-01		5.680E+00	9.269E+00	0.000E+00	0.037
MO-99	-4.157E+01		4.611E+01	6.846E+01	0.000E+00	-0.607
RU-103	1.929E+00		3.364E+00	5.778E+00	0.000E+00	0.334
RU-106	3.872E+00		2.913E+01	4.825E+01	0.000E+00	0.080
AG-110m	1.032E+00		3.043E+00	5.121E+00	0.000E+00	0.202
SN-113	-4.121E-01		3.933E+00	6.519E+00	0.000E+00	-0.063
SB-124	-2.624E+00		4.767E+00	5.018E+00	0.000E+00	-0.523
SB-125	1.025E+01		9.507E+00	1.683E+01	0.000E+00	0.609
TE-129M	-2.196E+01		3.731E+01	5.937E+01	0.000E+00	-0.370
I-131	-1.854E+00		3.823E+00	6.209E+00	0.000E+00	-0.299
BA-133	-1.103E+00		5.016E+00	7.111E+00	0.000E+00	-0.155
CS-134	-4.362E-01		3.670E+00	5.090E+00	0.000E+00	-0.086
CS-136	-1.339E+00		3.644E+00	5.669E+00	0.000E+00	-0.236
CS-137	6.320E-01		3.547E+00	5.880E+00	0.000E+00	0.107
CE-139	-1.272E+00		3.263E+00	5.268E+00	0.000E+00	-0.241
BA-140	-2.088E+00		1.252E+01	2.035E+01	0.000E+00	-0.103
LA-140	-2.677E+00		4.089E+00	5.911E+00	0.000E+00	-0.453
CE-141	-9.295E-01		5.999E+00	9.243E+00	0.000E+00	-0.101
CE-144	-9.258E+00		2.605E+01	3.988E+01	0.000E+00	-0.232
EU-152	-6.886E+00		1.028E+01	1.464E+01	0.000E+00	-0.470
EU-154	-3.983E+00		6.607E+00	1.067E+01	0.000E+00	-0.373
RA-226	3.140E+01		8.010E+01	1.343E+02	0.000E+00	0.234
AC-228	1.787E+00		1.222E+01	2.207E+01	0.000E+00	0.081
TH-232	1.785E+00		1.221E+01	2.205E+01	0.000E+00	0.081
U-235	4.340E+00		2.828E+01	4.067E+01	0.000E+00	0.107
U-238	-2.114E+02		3.325E+02	5.133E+02	0.000E+00	-0.412
AM-241	8.569E-03		3.704E+01	6.213E+01	0.000E+00	0.000

A, 11L29402-3	,07/30/2006	23:48,07/28/2006	11:25,	3.372E+00,WG	L29402-3 EX
B, 11L29402-3	,LIBD		,07/28/2006	09:50,1135L090204	
C, K-40	,YES,	3.080E+01,	5.482E+01,	4.437E+01,,	0.694
C, TH-228	,YES,	2.108E+00,	5.486E+00,	9.066E+00,,	0.232
C, BE-7	,NO ,	1.094E+01,	2.638E+01,	4.496E+01,,	0.243
C, NA-24	,NO ,	1.673E+01,	4.654E+01,	8.015E+01,,	0.209
C, CR-51	,NO ,	6.869E-01,	2.880E+01,	4.630E+01,,	0.015
C, MN-54	,NO ,	6.568E-01,	3.252E+00,	5.357E+00,,	0.123
C, CO-57	,NO ,	-2.455E-01,	3.145E+00,	5.183E+00,,	-0.047
C, CO-58	,NO ,	1.276E+00,	3.174E+00,	5.341E+00,,	0.239
C, FE-59	,NO ,	-1.423E+00,	5.741E+00,	9.224E+00,,	-0.154
C, CO-60	,NO ,	2.243E-01,	3.039E+00,	5.033E+00,,	0.045
C, ZN-65	,NO ,	1.106E+00,	7.728E+00,	1.118E+01,,	0.099
C, SE-75	,NO ,	-2.405E+00,	4.252E+00,	6.660E+00,,	-0.361
C, SR-85	,NO ,	-3.607E+00,	4.217E+00,	6.657E+00,,	-0.542
C, Y-88	,NO ,	-2.875E-01,	4.379E+00,	6.316E+00,,	-0.046
C, NB-94	,NO ,	2.813E+00,	3.371E+00,	5.852E+00,,	0.481
C, NB-95	,NO ,	2.638E+00,	3.202E+00,	5.590E+00,,	0.472
C, ZR-95	,NO ,	3.399E-01,	5.680E+00,	9.269E+00,,	0.037
C, MO-99	,NO ,	-4.157E+01,	4.611E+01,	6.846E+01,,	-0.607
C, RU-103	,NO ,	1.929E+00,	3.364E+00,	5.778E+00,,	0.334
C, RU-106	,NO ,	3.872E+00,	2.913E+01,	4.825E+01,,	0.080
C, AG-110m	,NO ,	1.032E+00,	3.043E+00,	5.121E+00,,	0.202
C, SN-113	,NO ,	-4.121E-01,	3.933E+00,	6.519E+00,,	-0.063
C, SB-124	,NO ,	-2.624E+00,	4.767E+00,	5.018E+00,,	-0.523
C, SB-125	,NO ,	1.025E+01,	9.507E+00,	1.683E+01,,	0.609
C, TE-129M	,NO ,	-2.196E+01,	3.731E+01,	5.937E+01,,	-0.370
C, I-131	,NO ,	-1.854E+00,	3.823E+00,	6.209E+00,,	-0.299
C, BA-133	,NO ,	-1.103E+00,	5.016E+00,	7.111E+00,,	-0.155
C, CS-134	,NO ,	-4.362E-01,	3.670E+00,	5.090E+00,,	-0.086
C, CS-136	,NO ,	-1.339E+00,	3.644E+00,	5.669E+00,,	-0.236
C, CS-137	,NO ,	6.320E-01,	3.547E+00,	5.880E+00,,	0.107
C, CE-139	,NO ,	-1.272E+00,	3.263E+00,	5.268E+00,,	-0.241
C, BA-140	,NO ,	-2.088E+00,	1.252E+01,	2.035E+01,,	-0.103
C, LA-140	,NO ,	-2.677E+00,	4.089E+00,	5.911E+00,,	-0.453
C, CE-141	,NO ,	-9.295E-01,	5.999E+00,	9.243E+00,,	-0.101
C, CE-144	,NO ,	-9.258E+00,	2.605E+01,	3.988E+01,,	-0.232
C, EU-152	,NO ,	-6.886E+00,	1.028E+01,	1.464E+01,,	-0.470
C, EU-154	,NO ,	-3.983E+00,	6.607E+00,	1.067E+01,,	-0.373
C, RA-226	,NO ,	3.140E+01,	8.010E+01,	1.343E+02,,	0.234
C, AC-228	,NO ,	1.787E+00,	1.222E+01,	2.207E+01,,	0.081
C, TH-232	,NO ,	1.785E+00,	1.221E+01,	2.205E+01,,	0.081
C, U-235	,NO ,	4.340E+00,	2.828E+01,	4.067E+01,,	0.107
C, U-238	,NO ,	-2.114E+02,	3.325E+02,	5.133E+02,,	-0.412
C, AM-241	,NO ,	8.569E-03,	3.704E+01,	6.213E+01,,	0.000

Sec. Review: 109 Analyst: W LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:09:03.44
 TBE14 P-10933A HpGe ***** Aquisition Date/Time: 30-JUL-2006 21:08:47.79

LIMS No., Customer Name, Client ID: WG L29402-4 EX ZION

Sample ID : 14L29402-4 Smple Date: 28-JUL-2006 11:12:00.
 Sample Type : WG Geometry : 1435L091304
 Quantity : 3.36510E+00 L BKGFILE : 14BG072806MT
 Start Channel : 90 Energy Tol : 1.00000 Real Time : 0 06:00:03.85
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 06:00:00.00
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	65.77*	320	1315	2.82	132.85	4.37E-01	1.48E-02	24.9	2.04E+00
2	1	74.89*	111	990	2.02	151.18	6.93E-01	5.14E-03	60.9	4.90E+00
3	1	140.21*	265	772	1.95	282.39	1.67E+00	1.23E-02	20.9	3.77E+00
4	1	185.54*	43	785	1.57	373.43	1.64E+00	2.00E-03	132.5	8.01E-01
5	1	198.71*	114	595	1.24	399.86	1.60E+00	5.30E-03	41.3	1.57E+00
6	1	238.96*	76	606	1.30	480.66	1.47E+00	3.53E-03	64.7	8.19E-01
7	1	295.81*	163	643	1.86	594.73	1.29E+00	7.54E-03	35.1	5.21E+00
8	1	352.20*	445	475	1.57	707.83	1.14E+00	2.06E-02	12.4	1.24E+00
9	1	583.75*	28	178	2.85	1171.74	7.91E-01	1.28E-03	113.2	2.44E+00
10	1	596.05	68	238	1.12	1196.35	7.79E-01	3.17E-03	51.0	1.51E+00
11	1	609.40*	404	209	1.62	1223.07	7.66E-01	1.87E-02	9.7	1.29E+00
12	1	768.23	89	127	5.35	1540.76	6.43E-01	4.12E-03	29.1	2.96E+00
13	1	1120.11*	101	65	1.87	2243.20	4.81E-01	4.67E-03	19.5	1.21E+00
14	1	1238.52*	47	100	3.69	2479.16	4.45E-01	2.19E-03	57.4	1.66E+00
15	1	1461.16*	18	52	2.18	2922.26	3.93E-01	8.52E-04	129.7	2.05E+00
16	1	1766.01*	74	58	2.39	3527.78	3.43E-01	3.44E-03	30.2	7.64E-01

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Nuclide Type: natural

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
K-40	1460.81	18	10.67*	3.927E-01	1.633E+01	1.633E+01	259.40
RA-226	186.21	43	3.28*	1.641E+00	2.979E+01	2.979E+01	265.07
TH-228	238.63	76	44.60*	1.467E+00	4.327E+00	4.338E+00	129.49
	240.98	-----	3.95	1.461E+00	-----	Line Not Found	-----
U-235	143.76	-----	10.50*	1.680E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.685E+00	-----	Line Not Found	-----
	185.71	43	54.00	1.641E+00	1.810E+00	1.810E+00	265.07
	205.31	-----	4.70	1.582E+00	-----	Line Not Found	-----

Flag: "*" = Keyline

Summary of Nuclide Activity
 Sample ID : 14L29402-4

Page : 2
 Acquisition date : 30-JUL-2006 21:08:47

Total number of lines in spectrum 16
 Number of unidentified lines 12
 Number of lines tentatively identified by NID 4 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.633E+01	1.633E+01	4.237E+01	259.40	
RA-226	1600.00Y	1.00	2.979E+01	2.979E+01	7.897E+01	265.07	
TH-228	1.91Y	1.00	4.327E+00	4.338E+00	5.618E+00	129.49	
U-235	7.04E+08Y	1.00	1.810E+00	1.810E+00	4.797E+00	265.07	K
Total Activity :			5.226E+01	5.227E+01			

Grand Total Activity : 5.226E+01 5.227E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines
 Sample ID : 14L29402-4

Page : 3
 Acquisition date : 30-JUL-2006 21:08:47

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.77	320	1315	2.82	132.85	126	14	1.48E-02	49.9	4.37E-01	
1	74.89	111	990	2.02	151.18	145	12	5.14E-03	****	6.93E-01	
1	140.21	265	772	1.95	282.39	277	10	1.23E-02	41.8	1.67E+00	
1	198.71	114	595	1.24	399.86	396	9	5.30E-03	82.6	1.60E+00	
1	295.81	163	643	1.86	594.73	587	14	7.54E-03	70.2	1.29E+00	
1	352.20	445	475	1.57	707.83	700	16	2.06E-02	24.8	1.14E+00	
1	583.75	28	178	2.85	1171.74	1166	13	1.28E-03	****	7.91E-01	T
1	596.05	68	238	1.12	1196.35	1190	15	3.17E-03	****	7.79E-01	
1	609.40	404	209	1.62	1223.07	1216	14	1.87E-02	19.3	7.66E-01	
1	768.23	89	127	5.35	1540.76	1537	15	4.12E-03	58.2	6.43E-01	
1	1120.11	101	65	1.87	2243.20	2238	10	4.67E-03	39.1	4.81E-01	
1	1238.52	47	100	3.69	2479.16	2466	21	2.19E-03	****	4.45E-01	
1	1766.01	74	58	2.39	3527.78	3518	21	3.44E-03	60.3	3.43E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 16
 Number of unidentified lines 12
 Number of lines tentatively identified by NID 4 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.633E+01	1.633E+01	4.237E+01	259.40	
RA-226	1600.00Y	1.00	2.979E+01	2.979E+01	7.897E+01	265.07	
TH-228	1.91Y	1.00	4.327E+00	4.338E+00	5.618E+00	129.49	
Total Activity :			5.045E+01	5.046E+01			

Grand Total Activity : 5.045E+01 5.046E+01

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.633E+01	4.237E+01	4.628E+01	0.000E+00	0.353
RA-226	2.979E+01	7.897E+01	1.219E+02	0.000E+00	0.244
TH-228	4.338E+00	5.618E+00	8.736E+00	0.000E+00	0.497

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.182E+01		2.448E+01	4.118E+01	0.000E+00	0.287
NA-24	-3.631E+01		4.876E+01	7.725E+01	0.000E+00	-0.470
CR-51	-1.784E+01		2.614E+01	4.203E+01	0.000E+00	-0.424
MN-54	-1.966E-01		2.652E+00	4.389E+00	0.000E+00	-0.045
CO-57	-1.163E+00		3.167E+00	5.125E+00	0.000E+00	-0.227
CO-58	1.565E-01		2.925E+00	4.770E+00	0.000E+00	0.033
FE-59	1.928E+00		5.015E+00	8.412E+00	0.000E+00	0.229
CO-60	2.989E-01		2.873E+00	4.709E+00	0.000E+00	0.063
ZN-65	1.686E+01		7.585E+00	1.204E+01	0.000E+00	1.400
SE-75	-4.149E+00		3.942E+00	6.327E+00	0.000E+00	-0.656
SR-85	1.844E+01		3.126E+00	5.952E+00	0.000E+00	3.098
Y-88	-5.495E-02		2.855E+00	4.664E+00	0.000E+00	-0.012
NB-94	1.085E+00		2.688E+00	4.467E+00	0.000E+00	0.243
NB-95	1.684E+00		3.330E+00	4.703E+00	0.000E+00	0.358
ZR-95	-2.760E+00		5.199E+00	7.815E+00	0.000E+00	-0.353
MO-99	-4.288E+00		3.835E+01	6.228E+01	0.000E+00	-0.069
RU-103	3.386E+00		2.949E+00	5.059E+00	0.000E+00	0.669
RU-106	6.634E+00		2.774E+01	4.369E+01	0.000E+00	0.152
AG-110m	-1.143E+00		2.703E+00	4.354E+00	0.000E+00	-0.262
SN-113	-3.376E+00		3.788E+00	5.997E+00	0.000E+00	-0.563
SB-124	-8.563E-01		7.346E+00	4.844E+00	0.000E+00	-0.177
SB-125	3.577E+00		8.167E+00	1.375E+01	0.000E+00	0.260
TE-129M	4.646E+00		3.352E+01	5.585E+01	0.000E+00	0.083
I-131	-1.059E+00		3.841E+00	5.846E+00	0.000E+00	-0.181
BA-133	2.728E+01		5.231E+00	8.517E+00	0.000E+00	3.202
CS-134	1.810E+01		7.448E+00	6.541E+00	0.000E+00	2.767
CS-136	6.349E-01		3.171E+00	5.203E+00	0.000E+00	0.122
CS-137	1.205E+00		3.014E+00	5.019E+00	0.000E+00	0.240
CE-139	-2.056E+00		3.013E+00	4.949E+00	0.000E+00	-0.415
BA-140	4.109E+00		1.142E+01	1.909E+01	0.000E+00	0.215
LA-140	8.175E-02		3.468E+00	5.722E+00	0.000E+00	0.014
CE-141	2.308E+00		6.567E+00	9.068E+00	0.000E+00	0.254
CE-144	-7.254E+00		2.831E+01	3.852E+01	0.000E+00	-0.188
EU-152	-7.372E+00		1.113E+01	1.487E+01	0.000E+00	-0.496
EU-154	1.938E+00		6.615E+00	1.083E+01	0.000E+00	0.179
AC-228	6.229E+00		1.076E+01	1.763E+01	0.000E+00	0.353
TH-232	6.223E+00		1.075E+01	1.762E+01	0.000E+00	0.353
U-235	5.032E+01		2.923E+01	4.148E+01	0.000E+00	1.213
U-238	-2.279E+01		2.996E+02	4.920E+02	0.000E+00	-0.046
AM-241	3.956E+00		5.091E+01	7.109E+01	0.000E+00	0.056

A,14L29402-4	,07/31/2006	03:09,07/28/2006	11:12,	3.365E+00,WG	L29402-4 EX
B,14L29402-4	,LIBD		,07/27/2006	14:28,1435L091304	
C,K-40	,YES,	1.633E+01,	4.237E+01,	4.628E+01,,	0.353
C,RA-226	,YES,	2.979E+01,	7.897E+01,	1.219E+02,,	-0.244
C,TH-228	,YES,	4.338E+00,	5.618E+00,	8.736E+00,,	0.497
C,BE-7	,NO ,	1.182E+01,	2.448E+01,	4.118E+01,,	0.287
C,NA-24	,NO ,	-3.631E+01,	4.876E+01,	7.725E+01,,	-0.470
C,CR-51	,NO ,	-1.784E+01,	2.614E+01,	4.203E+01,,	-0.424
C,MN-54	,NO ,	-1.966E-01,	2.652E+00,	4.389E+00,,	-0.045
C,CO-57	,NO ,	-1.163E+00,	3.167E+00,	5.125E+00,,	-0.227
C,CO-58	,NO ,	1.565E-01,	2.925E+00,	4.770E+00,,	0.033
C,FE-59	,NO ,	1.928E+00,	5.015E+00,	8.412E+00,,	0.229
C,CO-60	,NO ,	2.989E-01,	2.873E+00,	4.709E+00,,	0.063
C,ZN-65	,NO ,	1.686E+01,	7.585E+00,	1.204E+01,,	1.400
C,SE-75	,NO ,	-4.149E+00,	3.942E+00,	6.327E+00,,	-0.656
C,SR-85	,NO ,	1.844E+01,	3.126E+00,	5.952E+00,,	3.098
C,Y-88	,NO ,	-5.495E-02,	2.855E+00,	4.664E+00,,	-0.012
C,NB-94	,NO ,	1.085E+00,	2.688E+00,	4.467E+00,,	0.243
C,NB-95	,NO ,	1.684E+00,	3.330E+00,	4.703E+00,,	0.358
C,ZR-95	,NO ,	-2.760E+00,	5.199E+00,	7.815E+00,,	-0.353
C,MO-99	,NO ,	-4.288E+00,	3.835E+01,	6.228E+01,,	-0.069
C,RU-103	,NO ,	3.386E+00,	2.949E+00,	5.059E+00,,	0.669
C,RU-106	,NO ,	6.634E+00,	2.774E+01,	4.369E+01,,	0.152
C,AG-110m	,NO ,	-1.143E+00,	2.703E+00,	4.354E+00,,	-0.262
C,SN-113	,NO ,	-3.376E+00,	3.788E+00,	5.997E+00,,	-0.563
C,SB-124	,NO ,	-8.563E-01,	7.346E+00,	4.844E+00,,	-0.177
C,SB-125	,NO ,	3.577E+00,	8.167E+00,	1.375E+01,,	0.260
C,TE-129M	,NO ,	4.646E+00,	3.352E+01,	5.585E+01,,	0.083
C,I-131	,NO ,	-1.059E+00,	3.841E+00,	5.846E+00,,	-0.181
C,BA-133	,NO ,	2.728E+01,	5.231E+00,	8.517E+00,,	3.202
C,CS-134	,NO ,	1.810E+01,	7.448E+00,	6.541E+00,,	2.767
C,CS-136	,NO ,	6.349E-01,	3.171E+00,	5.203E+00,,	0.122
C,CS-137	,NO ,	1.205E+00,	3.014E+00,	5.019E+00,,	0.240
C,CE-139	,NO ,	-2.056E+00,	3.013E+00,	4.949E+00,,	-0.415
C,BA-140	,NO ,	4.109E+00,	1.142E+01,	1.909E+01,,	0.215
C,LA-140	,NO ,	8.175E-02,	3.468E+00,	5.722E+00,,	0.014
C,CE-141	,NO ,	2.308E+00,	6.567E+00,	9.068E+00,,	0.254
C,CE-144	,NO ,	-7.254E+00,	2.831E+01,	3.852E+01,,	-0.188
C,EU-152	,NO ,	-7.372E+00,	1.113E+01,	1.487E+01,,	-0.496
C,EU-154	,NO ,	1.938E+00,	6.615E+00,	1.083E+01,,	0.179
C,AC-228	,NO ,	6.229E+00,	1.076E+01,	1.763E+01,,	0.353
C,TH-232	,NO ,	6.223E+00,	1.075E+01,	1.762E+01,,	0.353
C,U-235	,NO ,	5.032E+01,	2.923E+01,	4.148E+01,,	1.213
C,U-238	,NO ,	-2.279E+01,	2.996E+02,	4.920E+02,,	-0.046
C,AM-241	,NO ,	3.956E+00,	5.091E+01,	7.109E+01,,	0.056

Summary of Nuclide Activity

Page : 2

Sample ID : 15L29402-5

Acquisition date : 30-JUL-2006 21:08:51

Total number of lines in spectrum	7	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 15L29402-5

Page : 3
Acquisition date : 30-JUL-2006 21:08:51

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.15	152	616	1.79	119.63	116	8	7.06E-03	61.4	4.31E-01	
1	139.58	81	400	1.17	267.42	265	6	3.76E-03	85.9	1.48E+00	
1	295.19	68	326	1.37	580.55	576	9	3.14E-03	****	1.05E+00	
1	351.71	224	305	1.53	694.27	687	14	1.04E-02	38.2	9.16E-01	
1	595.70	87	129	1.47	1185.02	1179	12	4.04E-03	56.4	5.97E-01	
1	608.82	190	197	1.60	1211.39	1205	15	8.81E-03	37.6	5.87E-01	
1	1120.26	59	49	3.14	2239.34	2231	15	2.72E-03	63.7	3.58E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 7
 Number of unidentified lines 7
 Number of lines tentatively identified by NID 0 0.00%
 **** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	7.008E+00		2.558E+01	4.289E+01	0.000E+00	0.163
NA-24	-7.559E+00		5.890E+01	9.560E+01	0.000E+00	-0.079
K-40	2.767E+01		4.217E+01	7.972E+01	0.000E+00	0.347
CR-51	-1.011E+01		2.623E+01	4.265E+01	0.000E+00	-0.237
MN-54	1.845E+00		2.827E+00	4.834E+00	0.000E+00	0.382
CO-57	1.513E+00		2.885E+00	4.819E+00	0.000E+00	0.314
CO-58	9.429E-01		2.794E+00	4.707E+00	0.000E+00	0.200
FE-59	5.450E+00		5.510E+00	9.710E+00	0.000E+00	0.561
CO-60	2.493E+00		3.060E+00	5.324E+00	0.000E+00	0.468
ZN-65	1.049E+01		7.390E+00	1.162E+01	0.000E+00	0.902
SE-75	-2.292E+00		3.958E+00	6.462E+00	0.000E+00	-0.355
SR-85	1.472E+01		3.300E+00	6.204E+00	0.000E+00	2.372
Y-88	-3.134E+00		3.177E+00	4.696E+00	0.000E+00	-0.667
NB-94	-1.164E+00		2.937E+00	4.686E+00	0.000E+00	-0.248
NB-95	1.664E+00		2.927E+00	4.993E+00	0.000E+00	0.333
ZR-95	-4.879E+00		5.202E+00	8.217E+00	0.000E+00	-0.594
MO-99	-3.835E+01		4.104E+01	6.491E+01	0.000E+00	-0.591
RU-103	1.428E+00		3.066E+00	5.169E+00	0.000E+00	0.276
RU-106	-1.762E+01		2.923E+01	4.441E+01	0.000E+00	-0.397
AG-110m	-1.090E+00		2.766E+00	4.424E+00	0.000E+00	-0.246
SN-113	-4.726E-01		3.989E+00	6.480E+00	0.000E+00	-0.073

SB-124	2.914E+00	6.275E+00	4.784E+00	0.000E+00	0.609
SB-125	8.578E-01	8.703E+00	1.419E+01	0.000E+00	0.060
TE-129M	-3.758E+01	3.461E+01	5.517E+01	0.000E+00	-0.681
I-131	2.085E-01	3.722E+00	6.102E+00	0.000E+00	0.034
BA-133	1.794E+01	4.978E+00	8.000E+00	0.000E+00	2.242
CS-134	2.004E+01	5.364E+00	6.618E+00	0.000E+00	3.028
CS-136	-3.914E-01	3.069E+00	5.036E+00	0.000E+00	-0.078
CS-137	7.304E-01	3.126E+00	5.165E+00	0.000E+00	0.141
CE-139	-9.157E-01	2.816E+00	4.578E+00	0.000E+00	-0.200
BA-140	1.241E+01	1.198E+01	2.062E+01	0.000E+00	0.602
LA-140	1.708E+00	4.096E+00	6.989E+00	0.000E+00	0.244
CE-141	-5.783E-02	6.001E+00	8.371E+00	0.000E+00	-0.007
CE-144	6.682E+00	2.591E+01	3.656E+01	0.000E+00	0.183
EU-152	-1.194E+01	1.103E+01	1.446E+01	0.000E+00	-0.826
EU-154	1.268E+00	6.215E+00	1.014E+01	0.000E+00	0.125
RA-226	-2.661E+01	7.474E+01	1.191E+02	0.000E+00	-0.223
AC-228	1.371E+00	1.156E+01	1.900E+01	0.000E+00	0.072
TH-228	8.326E+00	5.718E+00	9.715E+00	0.000E+00	0.857
TH-232	1.370E+00	1.155E+01	1.898E+01	0.000E+00	0.072
U-235	2.971E+00	2.704E+01	3.759E+01	0.000E+00	0.079
U-238	2.418E+01	3.398E+02	5.558E+02	0.000E+00	0.044
AM-241	-4.193E+01	4.422E+01	5.947E+01	0.000E+00	-0.705

A,15L29402-5	,07/31/2006	03:09,07/28/2006	09:45,	3.471E+00,WG	L29402-5 EX
B,15L29402-5	,LIBD		,07/28/2006	10:09,1535L090104	
C,BE-7	,NO ,	7.008E+00,	2.558E+01,	4.289E+01,,	0.163
C,NA-24	,NO ,	-7.559E+00,	5.890E+01,	9.560E+01,,	-0.079
C,K-40	,NO ,	2.767E+01,	4.217E+01,	7.972E+01,,	0.347
C,CR-51	,NO ,	-1.011E+01,	2.623E+01,	4.265E+01,,	-0.237
C,MN-54	,NO ,	1.845E+00,	2.827E+00,	4.834E+00,,	0.382
C,CO-57	,NO ,	1.513E+00,	2.885E+00,	4.819E+00,,	0.314
C,CO-58	,NO ,	9.429E-01,	2.794E+00,	4.707E+00,,	0.200
C,FE-59	,NO ,	5.450E+00,	5.510E+00,	9.710E+00,,	0.561
C,CO-60	,NO ,	2.493E+00,	3.060E+00,	5.324E+00,,	0.468
C,ZN-65	,NO ,	1.049E+01,	7.390E+00,	1.162E+01,,	0.902
C,SE-75	,NO ,	-2.292E+00,	3.958E+00,	6.462E+00,,	-0.355
C,SR-85	,NO ,	1.472E+01,	3.300E+00,	6.204E+00,,	2.372
C,Y-88	,NO ,	-3.134E+00,	3.177E+00,	4.696E+00,,	-0.667
C,NB-94	,NO ,	-1.164E+00,	2.937E+00,	4.686E+00,,	-0.248
C,NB-95	,NO ,	1.664E+00,	2.927E+00,	4.993E+00,,	0.333
C,ZR-95	,NO ,	-4.879E+00,	5.202E+00,	8.217E+00,,	-0.594
C,MO-99	,NO ,	-3.835E+01,	4.104E+01,	6.491E+01,,	-0.591
C,RU-103	,NO ,	1.428E+00,	3.066E+00,	5.169E+00,,	0.276
C,RU-106	,NO ,	-1.762E+01,	2.923E+01,	4.441E+01,,	-0.397
C,AG-110m	,NO ,	-1.090E+00,	2.766E+00,	4.424E+00,,	-0.246
C,SN-113	,NO ,	-4.726E-01,	3.989E+00,	6.480E+00,,	-0.073
C,SB-124	,NO ,	2.914E+00,	6.275E+00,	4.784E+00,,	0.609
C,SB-125	,NO ,	8.578E-01,	8.703E+00,	1.419E+01,,	0.060
C,TE-129M	,NO ,	-3.758E+01,	3.461E+01,	5.517E+01,,	-0.681
C,I-131	,NO ,	2.085E-01,	3.722E+00,	6.102E+00,,	0.034
C,BA-133	,NO ,	1.794E+01,	4.978E+00,	8.000E+00,,	2.242
C,CS-134	,NO ,	2.004E+01,	5.364E+00,	6.618E+00,,	3.028
C,CS-136	,NO ,	-3.914E-01,	3.069E+00,	5.036E+00,,	-0.078
C,CS-137	,NO ,	7.304E-01,	3.126E+00,	5.165E+00,,	0.141
C,CE-139	,NO ,	-9.157E-01,	2.816E+00,	4.578E+00,,	-0.200
C,BA-140	,NO ,	1.241E+01,	1.198E+01,	2.062E+01,,	0.602
C,LA-140	,NO ,	1.708E+00,	4.096E+00,	6.989E+00,,	0.244
C,CE-141	,NO ,	-5.783E-02,	6.001E+00,	8.371E+00,,	-0.007
C,CE-144	,NO ,	6.682E+00,	2.591E+01,	3.656E+01,,	0.183
C,EU-152	,NO ,	-1.194E+01,	1.103E+01,	1.446E+01,,	-0.826
C,EU-154	,NO ,	1.268E+00,	6.215E+00,	1.014E+01,,	0.125
C,RA-226	,NO ,	-2.661E+01,	7.474E+01,	1.191E+02,,	-0.223
C,AC-228	,NO ,	1.371E+00,	1.156E+01,	1.900E+01,,	0.072
C,TH-228	,NO ,	8.326E+00,	5.718E+00,	9.715E+00,,	0.857
C,TH-232	,NO ,	1.370E+00,	1.155E+01,	1.898E+01,,	0.072
C,U-235	,NO ,	2.971E+00,	2.704E+01,	3.759E+01,,	0.079
C,U-238	,NO ,	2.418E+01,	3.398E+02,	5.558E+02,,	0.044
C,AM-241	,NO ,	-4.193E+01,	4.422E+01,	5.947E+01,,	-0.705

Sec. Review: Analyst: LIMS:

=====

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:53:31.86
 TBE07 P-10768B HpGe ***** Aquisition Date/Time: 30-JUL-2006 23:53:22.27

LIMS No., Customer Name, Client ID: WG WG4276-1 EX ZION

Sample ID : 07WG4276-1 Smple Date: 28-JUL-2006 07:15:00.
 Sample Type : WG Geometry : 0735L090904
 Quantity : 3.32390E+00 L BKGFILE : 07BG072806MT
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:00:03.04
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:00:00.00
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	53.03	94	306	1.36	106.89	2.85E-01	6.53E-03	33.7	6.49E-01
2	1	66.34*	108	346	1.03	133.54	7.25E-01	7.50E-03	30.2	2.31E+00
3	1	139.87*	101	407	1.34	280.80	2.09E+00	6.99E-03	39.3	2.49E+00
4	1	198.43*	126	299	1.22	398.07	1.98E+00	8.72E-03	26.6	5.86E-01
5	1	295.23*	107	288	1.13	591.88	1.61E+00	7.42E-03	33.1	2.16E+00
6	1	351.83*	305	221	1.09	705.20	1.43E+00	2.12E-02	11.8	1.98E+00
7	1	595.68	67	128	2.05	1193.35	9.97E-01	4.65E-03	36.3	1.66E+00
8	1	609.45*	239	161	1.68	1220.92	9.80E-01	1.66E-02	14.2	2.03E+00
9	1	831.67	28	55	2.07	1665.62	7.82E-01	1.96E-03	52.3	2.16E+00
10	1	907.79	36	20	1.95	1817.94	7.32E-01	2.51E-03	22.6	1.99E+00
11	1	1120.33*	85	42	2.59	2243.17	6.26E-01	5.88E-03	19.6	1.97E+00
12	1	1730.79	15	24	1.60	3463.93	4.60E-01	1.06E-03	78.1	7.62E-01
13	1	1764.99*	56	19	2.74	3532.30	4.54E-01	3.87E-03	25.2	2.47E+00

Flag: "*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "*" = Keyline

Summary of Nuclide Activity

Page : 2

Sample ID : 07WG4276-1

Acquisition date : 30-JUL-2006 23:53:22

Total number of lines in spectrum	13	
Number of unidentified lines	13	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

Unidentified Energy Lines
Sample ID : 07WG4276-1

Page : 3
Acquisition date : 30-JUL-2006 23:53:23

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	53.03	94	306	1.36	106.89	104	8	6.53E-03	67.3	2.85E-01	
1	66.34	108	346	1.03	133.54	131	6	7.50E-03	60.4	7.25E-01	
1	139.87	101	407	1.34	280.80	276	9	6.99E-03	78.6	2.09E+00	
1	198.43	126	299	1.22	398.07	394	8	8.72E-03	53.1	1.98E+00	
1	295.23	107	288	1.13	591.88	587	10	7.42E-03	66.1	1.61E+00	
1	351.83	305	221	1.09	705.20	700	12	2.12E-02	23.7	1.43E+00	
1	595.68	67	128	2.05	1193.35	1189	12	4.65E-03	72.6	9.97E-01	
1	609.45	239	161	1.68	1220.92	1215	15	1.66E-02	28.3	9.80E-01	
1	831.67	28	55	2.07	1665.62	1660	10	1.96E-03	****	7.82E-01	
1	907.79	36	20	1.95	1817.94	1815	17	2.51E-03	45.3	7.32E-01	
1	1120.33	85	42	2.59	2243.17	2236	14	5.88E-03	39.2	6.26E-01	
1	1730.79	15	24	1.60	3463.93	3456	15	1.06E-03	****	4.60E-01	
1	1764.99	56	19	2.74	3532.30	3526	16	3.87E-03	50.5	4.54E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 13
 Number of unidentified lines 13
 Number of lines tentatively identified by NID 0 0.00%
 **** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-3.899E+00		2.057E+01	3.370E+01	0.000E+00	-0.116
NA-24	-3.487E+01		6.251E+01	9.807E+01	0.000E+00	-0.356
K-40	-1.114E+01		3.314E+01	6.189E+01	0.000E+00	-0.180
CR-51	-3.733E+00		2.299E+01	3.767E+01	0.000E+00	-0.099
MN-54	1.404E+00		3.072E+00	4.373E+00	0.000E+00	0.321
CO-57	9.824E-01		2.527E+00	4.131E+00	0.000E+00	0.238
CO-58	-2.661E-01		2.551E+00	4.139E+00	0.000E+00	-0.064
FE-59	5.041E+00		4.840E+00	8.454E+00	0.000E+00	0.596
CO-60	3.885E-01		2.525E+00	4.197E+00	0.000E+00	0.093
ZN-65	1.738E+01		6.579E+00	1.117E+01	0.000E+00	1.556
SE-75	-2.283E-01		3.377E+00	5.617E+00	0.000E+00	-0.041
SR-85	2.095E+01		3.136E+00	6.212E+00	0.000E+00	3.372
Y-88	1.854E-02		2.765E+00	4.506E+00	0.000E+00	0.004
NB-94	-1.187E+00		2.520E+00	4.060E+00	0.000E+00	-0.292
NB-95	1.924E+00		2.620E+00	4.463E+00	0.000E+00	0.431

ZR-95	-1.311E+00	4.512E+00	7.284E+00	0.000E+00	-0.180
MO-99	2.569E+00	3.706E+01	6.117E+01	0.000E+00	0.042
RU-103	2.070E+00	2.562E+00	4.375E+00	0.000E+00	0.473
RU-106	-3.049E+00	2.505E+01	3.840E+01	0.000E+00	-0.079
AG-110m	-1.970E+00	2.454E+00	3.900E+00	0.000E+00	-0.505
SN-113	-2.577E-01	3.286E+00	5.326E+00	0.000E+00	-0.048
SB-124	-5.865E-01	5.953E+00	4.209E+00	0.000E+00	-0.139
SB-125	-4.500E+00	6.762E+00	1.093E+01	0.000E+00	-0.412
TE-129M	5.870E-01	2.975E+01	4.934E+01	0.000E+00	0.012
I-131	6.465E-01	3.113E+00	5.130E+00	0.000E+00	0.126
BA-133	1.252E+01	4.221E+00	6.769E+00	0.000E+00	1.850
CS-134	9.149E+00	6.009E+00	5.409E+00	0.000E+00	1.691
CS-136	-1.774E-01	2.721E+00	4.362E+00	0.000E+00	-0.041
CS-137	2.659E+00	2.711E+00	4.715E+00	0.000E+00	0.564
CE-139	-3.043E+00	2.504E+00	4.009E+00	0.000E+00	-0.759
BA-140	5.517E+00	1.007E+01	1.696E+01	0.000E+00	0.325
LA-140	1.694E+00	3.446E+00	5.905E+00	0.000E+00	0.287
CE-141	2.837E+00	5.063E+00	7.378E+00	0.000E+00	0.385
CE-144	-2.502E+01	2.176E+01	2.981E+01	0.000E+00	-0.839
EU-152	-1.035E+01	9.480E+00	1.236E+01	0.000E+00	-0.837
EU-154	-1.956E+00	5.331E+00	8.531E+00	0.000E+00	-0.229
RA-226	-1.044E+02	6.480E+01	1.036E+02	0.000E+00	-1.008
AC-228	-1.274E+00	9.790E+00	1.667E+01	0.000E+00	-0.076
TH-228	5.975E+00	5.038E+00	8.617E+00	0.000E+00	0.693
TH-232	-1.273E+00	9.781E+00	1.665E+01	0.000E+00	-0.076
U-235	4.517E-01	2.251E+01	3.210E+01	0.000E+00	0.014
U-238	5.207E+01	2.943E+02	4.796E+02	0.000E+00	0.109
AM-241	-5.565E+01	2.897E+01	3.631E+01	0.000E+00	-1.532

A,07WG4276-1	,07/31/2006	03:53,07/28/2006	07:15,	3.324E+00,WG	WG4276-1 EX
B,07WG4276-1	,LIBD		,07/28/2006	09:50,0735L090904	
C,BE-7	,NO	, -3.899E+00,	2.057E+01,	3.370E+01,,	-0.116
C,NA-24	,NO	, -3.487E+01,	6.251E+01,	9.807E+01,,	-0.356
C,K-40	,NO	, -1.114E+01,	3.314E+01,	6.189E+01,,	-0.180
C,CR-51	,NO	, -3.733E+00,	2.299E+01,	3.767E+01,,	-0.099
C,MN-54	,NO	, 1.404E+00,	3.072E+00,	4.373E+00,,	0.321
C,CO-57	,NO	, 9.824E-01,	2.527E+00,	4.131E+00,,	0.238
C,CO-58	,NO	, -2.661E-01,	2.551E+00,	4.139E+00,,	-0.064
C,FE-59	,NO	, 5.041E+00,	4.840E+00,	8.454E+00,,	0.596
C,CO-60	,NO	, 3.885E-01,	2.525E+00,	4.197E+00,,	0.093
C,ZN-65	,NO	, 1.738E+01,	6.579E+00,	1.117E+01,,	1.556
C,SE-75	,NO	, -2.283E-01,	3.377E+00,	5.617E+00,,	-0.041
C,SR-85	,NO	, 2.095E+01,	3.136E+00,	6.212E+00,,	3.372
C,Y-88	,NO	, 1.854E-02,	2.765E+00,	4.506E+00,,	0.004
C,NB-94	,NO	, -1.187E+00,	2.520E+00,	4.060E+00,,	-0.292
C,NB-95	,NO	, 1.924E+00,	2.620E+00,	4.463E+00,,	0.431
C,ZR-95	,NO	, -1.311E+00,	4.512E+00,	7.284E+00,,	-0.180
C,MO-99	,NO	, 2.569E+00,	3.706E+01,	6.117E+01,,	0.042
C,RU-103	,NO	, 2.070E+00,	2.562E+00,	4.375E+00,,	0.473
C,RU-106	,NO	, -3.049E+00,	2.505E+01,	3.840E+01,,	-0.079
C,AG-110m	,NO	, -1.970E+00,	2.454E+00,	3.900E+00,,	-0.505
C,SN-113	,NO	, -2.577E-01,	3.286E+00,	5.326E+00,,	-0.048
C,SB-124	,NO	, -5.865E-01,	5.953E+00,	4.209E+00,,	-0.139
C,SB-125	,NO	, -4.500E+00,	6.762E+00,	1.093E+01,,	-0.412
C,TE-129M	,NO	, 5.870E-01,	2.975E+01,	4.934E+01,,	0.012
C,I-131	,NO	, 6.465E-01,	3.113E+00,	5.130E+00,,	0.126
C,BA-133	,NO	, 1.252E+01,	4.221E+00,	6.769E+00,,	1.850
C,CS-134	,NO	, 9.149E+00,	6.009E+00,	5.409E+00,,	1.691
C,CS-136	,NO	, -1.774E-01,	2.721E+00,	4.362E+00,,	-0.041
C,CS-137	,NO	, 2.659E+00,	2.711E+00,	4.715E+00,,	0.564
C,CE-139	,NO	, -3.043E+00,	2.504E+00,	4.009E+00,,	-0.759
C,BA-140	,NO	, 5.517E+00,	1.007E+01,	1.696E+01,,	0.325
C,LA-140	,NO	, 1.694E+00,	3.446E+00,	5.905E+00,,	0.287
C,CE-141	,NO	, 2.837E+00,	5.063E+00,	7.378E+00,,	0.385
C,CE-144	,NO	, -2.502E+01,	2.176E+01,	2.981E+01,,	-0.839
C,EU-152	,NO	, -1.035E+01,	9.480E+00,	1.236E+01,,	-0.837
C,EU-154	,NO	, -1.956E+00,	5.331E+00,	8.531E+00,,	-0.229
C,RA-226	,NO	, -1.044E+02,	6.480E+01,	1.036E+02,,	-1.008
C,AC-228	,NO	, -1.274E+00,	9.790E+00,	1.667E+01,,	-0.076
C,TH-228	,NO	, 5.975E+00,	5.038E+00,	8.617E+00,,	0.693
C,TH-232	,NO	, -1.273E+00,	9.781E+00,	1.665E+01,,	-0.076
C,U-235	,NO	, 4.517E-01,	2.251E+01,	3.210E+01,,	0.014
C,U-238	,NO	, 5.207E+01,	2.943E+02,	4.796E+02,,	0.109
C,AM-241	,NO	, -5.565E+01,	2.897E+01,	3.631E+01,,	-1.532

APPENDIX E

DATA VALIDATION MEMORANDUM



MEMORANDUM

TO: Steve Quigley
FROM: Kathy Shaw/ks/11/CT 
REF. NO.: 45136-30
DATE: July 6, 2006
Revision Date: August 23, 2006
RE: Data Quality Assessment and Verification
Fleetwide Assessment - Hydrogeologic Investigation
Zion Station - Zion, Illinois

This memorandum details a data verification of the radiochemical data resulting from the collection of 25 groundwater, one (1) surface water and three (3) quality control samples from the Zion Station in Zion, Illinois. The sample summary detailing sample identification, sample location, quality control samples, and analytical parameters is presented in Table 1. Sample analysis was completed at Teledyne Brown Engineering in Knoxville, Tennessee (TBE) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods.¹

Sample Quantitation

The laboratory reported several radionuclides with activity concentrations above the minimum detectable concentration (MDC) and greater than the three (3) sigma critical level (99% confidence interval), but qualified them as not detected due to the presence of interference preventing identification of the major peaks, with a U* flag. Based on the laboratory qualification definition these concentrations should be qualified as not-detected (U*) above the laboratory reported MDC.

Sample Preservation

Samples collected for gamma scan and total strontium analyses are to be preserved to a pH of less than or equal to two (2) during shipment and laboratory storage with nitric acid at the time of collection. The samples were shipped and maintained in accordance with the sample preservation requirements.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free of radioactive material contamination produced by the laboratory conditions or procedures.

¹PRESCRIBED PROCEDURE FOR MEASUREMENT OF RADIOACTIVITY IN DRINKING WATER EPA-600/4-80-032

Laboratory Control Sample Analysis

The laboratory control sample (LCS) is a sample containing a known amount of a radionuclide that is equivalent to internal or external control samples prepared by the analytical laboratory or a Federal/State agency. The LCS percent recoveries were within the laboratory or agency control limits, indicating that an acceptable level of overall performance was achieved.

Duplicate Sample Analyses

The laboratory precision of matrix-specific measurement system was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria. No targeted analytes were reported as detected in the laboratory duplicate sample sets.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of three (3) field duplicate sample sets. No targeted radionuclides were reported as detected in the field duplicate sample sets.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

TABLE 1
SAMPLE KEY
FLEETWIDE ASSESSMENT
ZION STATION
ZION , ILLINOIS

<i>Sample Location</i>	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Date</i>	<i>Sample Matix</i>	<i>Analysis</i>
MW-ZN-08S(L)	WG-Zion-MW-8L-052406-MS-001		5/24/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-04S(U)	WG-Zion-MW-4U-052406-MB-002		5/24/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-08S(U)	WG-Zion-MW-8U-052406-MS-003		5/24/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-04S(L)	WG-Zion-MW-4L-052406-MB-004		5/24/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-07S(U)	WG-Zion-MW-7U-052406-MS-005		5/24/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-07S(L)	WG-Zion-MW-7L-052506-MS-007		5/25/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-06S(L)	WG-Zion-MW-6L-052506-MS-009		5/25/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-03S(U)	WG-ZN-MW-ZN-03U-052506-DS-01		5/25/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-03S(U)	WG-ZN-MW-ZN-03U-052506-DS-02	Duplicate (01)	5/25/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-03S(L)	WG-ZN-MW-ZN-03L-052506-DS-03		5/25/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-02S(U)	WG-ZN-MW-ZN-02U-052606-DS-04		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-01S(U)	WG-ZN-MW-ZN-01U-052606-DS-05		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-02S(L)	WG-ZN-MW-ZN-02L-052606-DS-06		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-01S(L)	WG-ZN-MW-ZN-01L-052606-DS-07		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-09S	WG-ZN-MW-ZN-09-052606-DS-08		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-09S	WG-ZN-MW-ZN-09-052606-DS-09	Duplicate (08)	5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-06S(U)	WG-Zion-MW-6U-052606-MS-011		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-05S(L)	WG-Zion-MW-5L-052606-MS-013		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
SW-ZN-1	WS-Zion-Lake-052606-MS-015		5/26/06	Surface Water	Tritium/Strontium/Gamma Spectrum
MW-ZN-05S(U)	WG-Zion-MW-5U-052606-MS-017		5/26/06	Groundwater	Tritium/Strontium/Gamma Spectrum
TW-ZN-100	GW-071706-JL-TW-ZN-100		7/17/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
TW-ZN-101	GW-071706-JL-TW-ZN-101		7/17/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
TW-ZN-102	GW-071706-JL-TW-ZN-102		7/17/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
TW-ZN-103	GW-071706-JL-TW-ZN-103		7/17/2006	Groundwater	Tritium/Strontium/Gamma Spectrum

TABLE 1
SAMPLE KEY
FLEETWIDE ASSESSMENT
ZION STATION
ZION , ILLINOIS

<i>Sample Location</i>	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Date</i>	<i>Sample Matix</i>	<i>Analysis</i>
MW-ZN-10S(U)	WG-ZN-MW-ZN-10U-072806-MS-003		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-10S(U)	WG-ZN-MW-ZN-10U-072806-MS-004	Duplicate (003)	7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-10S(L)	WG-ZN-MW-ZN-10L-072806-MS-005		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-11S(U)	WG-ZN-MW-ZN-11U-072806-TL-001		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-ZN-11S(L)	WG-ZN-MW-ZN-11L-072806-TL-002		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum

QC - Quality Control

Gamma Spectrum - Barium-140, Cesium-134, Cesium-137, Cobalt-58, Cobalt-60, Iron-59, Lanthanum-140,
Manganese-54, Niobium-95, Zinc-65, Zirconium-95

Isotopes not listed in Table 1, but typically detected in environmental samples
(i.e. Ac-228, K-40, Be-7, Ra-226, Th-228, Th-232, etc.) were reported if detected.

TABLE 2

SUMMARY OF ANALYTICAL METHODS, HOLDING TIME PERIODS, AND PRESERVATIVES
FLEETWIDE ASSESSMENT
ZION STATION
ZION, ILLINOIS

<i>Parameter</i>	<i>Method</i> ¹	<i>Matrix</i>	<i>Holding Time</i>	<i>Preservation</i>
Tritium	EPA 906.0	Water	- 6 months	None
Strontium - 89/90 (Total)	EPA 905.0	Water	- 6 months	HNO3 to pH<2
Gamma Spectrum	EPA 901.1	Water	- 6 months	HNO3 to pH<2

¹ EPA-60/40-80-032 August 1980 "Prescribed Procedures For Measurement of Radioactivity In Drinking Water"