Uracan
North Shore Property
Double S Zone
Technical Report,
Quebec, Canada

Report Prepared for

Uracan Resources Ltd.

Report Prepared by

srk consulting

SRK Consulting (Canada) Inc.
2CU004.000
August 15th, 2011

Uracan North Shore Property Double S Zone Technical Report, Quebec, Canada

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Cover Photo: Uracan Project Site, North Shore Property, Quebec.

Executive Summary

Uracan Resources Ltd. ("Uracan") is a mineral exploration company focused on exploring and developing bulk tonnage, near-surface uranium deposits, with its 100%-owned Canadian projects.

On May 10, 2010, Uracan disclosed a mineral resource statement of the North Shore Property as documented in an SRK technical report, dated June 24, 2010. In the report, all mineral resources were classified into an Inferred category, although SRK stated that the confidence in the geological and grade continuity was sufficient to support an Indicated classification for small portions of the Double S Deposit. Lack of any metallurgical testing supporting potential for future recoveries was cited as the reason behind the resource classification.

On March 2, 2011 Uracan received results for metallurgical testing work completed by SGS Canada Inc. ("SGS") on samples from the North Shore Property. The SGS report provides the necessary support that uranium can potentially be economically recovered from the deposit. The SGS report triggered a re-evaluation of the classification criteria, considered by SRK, to derive the mineral resource statement. This technical report documents an updated mineral resource statement, prepared by SRK, to take into account the results of the metallurgical testing work. Apart from the metallurgical test work, no additional exploration was completed on the property. The mineral resource statement reported herein represents the third mineral resource evaluation prepared for the Double S uranium zone.

The purpose of this technical report is to provide a summary of technical information relating to the mineral resource at Uracan"s Double S zone. This technical report has been prepared in accordance with Canadian Securities Administrators" National Instrument 43-101 and Form 43-101F1.

The North Shore Property consists of 16 claim blocks covering 100,229.68 hectares or 1,002.3 km^2 located in the Havre St. Pierre, Aguanish and Natashquan corridor along the North Shore of the Gulf of St. Lawrence (NTS 12K/11 and 12; 12/L06, 07, 08, and 09).

Relief is quite variable on the North Shore Property and is characteristic of the Middle North Shore area with low relief and extended swamps. Elevations range from 10 to 110 m above sea level on the Turgeon Lake claims. The claim blocks can be easily accessed via Provincial Highway #138.

The discovery of uraninite and pitchblende in pegmatite of the Turgeon Lake Intrusive Complex in 1967 precipitated a major staking rush by a large number of junior companies. This event was followed in 1975 by a second staking rush, this time dominated by major companies such as Denison Mines Ltd., Imperial Oil Ltd. and Uranerz.

Attention returned to some of the major pegmatite bodies in the mid-1980s, and the last significant look at exploration possibilities in the region was a brief and inconclusive study of the entire Wakeham stratigraphy by Cogema Inc. in 2000.

Four of the six priority areas identified by Cogema for uranium mineralization are covered by the North Shore Property. These include the Caron Lake Deformation Zone and the Costebelle Lake occurrences from the Highway and Pontbriand "A", "B" and "C" claim blocks; occurrences of Turgeon Lake Intrusive Complex from the WeeGee "A" and "B" claim blocks, and the Turgeon "A", "B" and "C" claim blocks.

Rocks of the North Shore Property are dominantly migmatite, gneiss and gneissic textured S-type granite. Rafts of strongly metamorphosed sandstone, arkose (now quartzite and quartzofeldspathic gneiss) and mafic volcanic rock (now amphibolites) are found within the granitic gneiss. Aplitic to coarse grained granite and granitic gneiss with pegmatitic dyke cross-cut the sequence.

Regional structures trend north to northwest, and display large-scale curvilinear folding. The core areas of such folds expose granite. The gneisses are variously draped around the cores or have been partially consumed by the granite pluton. Locally, the granitic gneisses are very weakly or only moderately strongly foliated and the distinction between metamorphic and plutonic phases is made with difficulty.

Uranium mineralization is genetically related and is akin to two possible deposit models, not necessarily exclusive of each other: Model 1 - Vein and Disseminated Intragranite Uranium Deposits, and Model 2 - Iron Oxide Breccias Uranium (-Copper-Gold) Deposits. The main focus to date by Uracan has been on the Rössing style mineralization (Model 1).

The uranium mineralization noted to date on the North Shore property is hosted by felsic intrusive bodies, dominantly granite and pegmatite, as well as lesser tonalite, syenite and monzonite, generally described in the field as granites.

Diamond drilling was carried out on the North Shore Property between 2007 and 2009 in three areas within Turgeon A claim group. The work was completed by Forage Nordic and Forages Performax Inc., both of Val-d"Or, Quebec, under contract to Uracan. In total, 213 core holes were drilled. The Double S zone was drilled in 2007 (61 holes) and 2009 (31 holes).

Uracan has a number of internal data checks and verification protocols to ensure the accuracy of the information generated from the field work programs. Internal database verification was carried out to ensure the accuracy of the database. Lab data, drill log data, down hole survey data and drill collar data were compiled in a Microsoft Access database which was used to flag any errors for follow up by Uracan and/or its field contractors. Any errors noted were corrected on a case by case basis.

Uracan carried out checks on drill hole collar locations by field checks using handheld GPS units after each drill hole was completed. In addition, all drill holes completed up to April 2009 were surveyed by a professional surveyor. Drill holes completed subsequent to that date have been surveyed using hand held GPS units. This information was checked against the original planned drill hole location to ensure the information on drill hole numbering was correct. No errors in drill hole locations have been noted.

SRK conducted routine verifications to ascertain the reliability of the electronic borehole database provided by Uracan. All assays in the current database were verified against the independently sourced sample certificates from ALS Chemex. The U_3O_8 values in the assay table were found to match the laboratory certificates.

SRK completed an audit of the Uracan analytical quality control data acquired with the sampling of the Double S Deposit. This involved analysis of the drillhole and assay database, review of the certificate data received directly from ALS Chemex and review of assay results for blank, standard and duplicate samples. The audit concluded that uranium grades can be reasonably reproduced, suggesting that the assays results reported by ALS Chemex are generally reliable for the purpose of resource estimation.

In March 2011, SGS completed preliminary metallurgical test work on samples from the North Shore Property. Results indicate that uranium can be effectively leached from pulverized samples in gentle agitated bottles with uranium extraction greater than 85%. Acid requirements were moderate and the leach residue can be neutralized leaving a clean effluent.

It was commented by SGS in their report that the low grade nature of the samples tested would suggest heap leaching is the expected processing method. Consequently, additional testwork was recommended by SGS on coarse crushed mineralized samples as well as column testing. While no evaluation of different processing methods has been made at this stage, it would be reasonable to expect lower uranium recoveries than that reported by SGS. Until further testwork has been completed to define extraction rates under different processing conditions, the expected metallurgical recovery will remain at 90%.

The database used to estimate resources in the Double S zone was compiled by Uracan. It comprises descriptive and assay information from exploration drilling conducted by Uracan in 2007 and 2009. Geological modelling was completed by SRK using Datamine Studio 2. SRK constructed solid wireframes representing the mineralized envelope and barren xenoliths using the drilling data and sectional interpretations provided by Uracan. The provided interpretations included GEMS wireframes of barren gneiss.

Mineral Resources were estimated in conformity with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserve Best Practices" Guidelines. The confidence in the geological and grade continuity is sufficient to support an Indicated classification for small portions of the Double S Deposit.

In order to determine the quantities of material offering reasonable prospects for economic extraction from an open pit, SRK used a Whittle pit optimizer to evaluate the profitability of each resource block based on certain optimization parameters selected from comparable projects. The optimization parameters include: mining and processing costs of CN$14.50 per processed tonne, overall pit slope angles of 45 degrees, metallurgical recovery of 90%, and appropriate dilution and offsite costs and royalties. A uranium price of US$75 per pound of uranium oxide was considered. The reader is cautioned that the results from the conceptual pit optimization work are used solely for the purpose of reporting Mineral Resources that have "reasonable prospects" for economic extraction by an open pit and do not represent an attempt to estimate mineral reserves.

SRK compared the mineralogy and geology of the Double S Deposit with several similar deposits. Considering the nature of the uranium mineralization and the results of the conceptual pit optimizations work, SRK considers that it is appropriate to report the Mineral Resources at a cut-off grade of 0.01% U_3O_8. This cut-off is in line with 0.009% U_3O_8 cut-off used to report the mineral resources for the Middle and TJ zones of the North Shore property. Similar cut-off grades are also used at the Rössing Mine (0.008% U_3O_8) and at Valencia deposit (0.007% U_3O_8), both in Namibia. The Mineral Resource Statement for the Double S uranium deposit is presented in Table i below.

A number of factors may affect the quality and quantity of the current estimates, and thereby highlight opportunities for improvement:

- There is some uncertainty on the geometry of the modelled barren xenoliths. Additional drill hole information would definitely assist in better definition of the barren zones.
- Thorough QA/QC procedures with higher number of blanks and standards inserted into the sample stream would ensure greater confidence in the assay data.

Table i: Mineral Resource Statement*, Double S Zone, North Shore Property, Quebec, SRK Consulting (Canada) Inc, July 4, 2011

Classification	Tonnage (tonnes)	Grade U3O8 (%)	Contained metal U_3O_8 (lb)
Indicated	21,504,000	0.014	6,858,000
Inferred	59,960,000	0.012	16,328,000

* Reported at a cut-off grade of 0.01 percent within a Whittle pit shell optimized using a U_3O_8 price of US$75 per pound of U_3O_8, metallurgical recovery of ninety percent, and overall mining and processing costs of CN$14.50. All numbers are rounded to reflect relative accuracy of the estimates.

The following recommendations provide a framework for future drilling and improved geology and resource models:

- The lateral and down dip extensions of uranium zones in both Area 1 and Area 2 are not well established. More drilling is required to define the full extent of the uranium mineralization. In particular, the area between Area 1 and Area 2 and in the northeast extension of Area 1 should be investigated by drilling;
- Infill drilling in Area 2 is required to improve the confidence in the geological interpretation and to define the shape of that uranium mineralization domain. This additional drilling would also help in demonstrating grade continuity with variography to support resource estimation;
- Out of 197 sample batches, 161 have no standards within the batch. This means the number of standards utilized by Uracan is well below what is recommended by industry best practises. Future drilling and assaying should include one standard and one blank for every 20 samples;
- SRK recommends using control samples at two grade thresholds, one near the average grade of the deposit (0.007%) and one at a grade of around 0.013%;
- Specific gravity measurements should be routinely measured on core samples from all rock types to augment the existing data and confirm variability of specific gravity between barren and uranium-bearing rocks;
- The topographic surface used to constrain the resource model was created from borehole collar data. This is not suitable to map the local variation of topography around the deposits and for supporting meaningful engineering studies. SRK recommends that a more accurate digital terrain model is obtained for Double S project area and the surrounding areas where potential mine infrastructure could be located; and
- SRK suggest additional metallurgical testwork be conducted on a range of North Shore samples to define the impact of crush size and leaching conditions on uranium extraction levels. Testwork should include mineralogical and liberation analysis, leach kinetic studies on different crushed feed sizes as well as possible agglomeration requirements.

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Important Notice

This report was prepared as a National Instrument 43-101 Technical Report for Uracan Resources Ltd (“Uracan”) by SRK Consulting (Canada) Inc. (“SRK”). The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in SRK"s services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Uracan subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits Uracan to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to National Instrument 43-101, Standards of Disclosure for Mineral Projects. Except for the purposes legislated under provincial securities law, any other uses of this report by any third party is at that party"s sole risk. The responsibility for this disclosure remains with Uracan. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

1 Introduction

The North Shore Project is an early stage uranium exploration project, located in Canada. It is located in the Havre St. Pierre along the North Shore of the Gulf of St. Lawrence, in the province of Quebec. Uracan Resources Ltd. (“Uracan”) is a mineral exploration company focused on exploring and developing bulk tonnage, near-surface uranium. Uracan has purchased a 100% interest in the Lac Turgeon, Wee Gee, Pontbriand and Costebelle properties (the “North Shore Properties”).

SRK Consulting (Canada) Inc. (“SRK”) was initially engaged by Uracan to prepare a revised mineral resource statement for the Double S uranium zone of the North Shore Property, Quebec, to take into account a second stage of drilling on the project. The revised resource statement was summarized in a technical report dated June 24, 2010. In the report, all mineral resources were classified into an Inferred category, although SRK stated that the confidence in the geological and grade continuity was sufficient to support an Indicated classification for small portions of the Double S Deposit. Lack of any metallurgical testing supporting potential for future recoveries was cited as the reason behind the resource classification.

On March 2, 2011 Uracan received results for metallurgical testing work completed by SGS Canada Inc (“SGS”) on samples from the North Shore Property. The SGS report triggered a re-evaluation of the classification criteria considered by SRK to derive the mineral resource statement. This technical report documents an updated mineral resource statement prepared by SRK to take into account the results of the metallurgical testing work. Apart from the metallurgical test work, no additional exploration was completed on the property. The mineral resource statement reported herein represents the third mineral resource evaluation prepared for the Double S uranium zone.

This technical report documents a mineral resource statement for the North Shore Project prepared by SRK. It was prepared following the guidelines of the Canadian Securities Administrators‟ National Instrument 43-101 and Form 43-101F1. The mineral resource statement reported herein was prepared in conformity with generally accepted CIM “Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines.”

This technical report summarizes the technical information available on the Double S Uranium deposit of the North Shore Project. In the opinion of SRK, this exploration property has merit warranting additional exploration expenditures. An exploration work program is recommended comprising core drilling, geological and mineral resource modelling. The purpose of the recommended work program is to increase the size of the resource and improve the confidence in the estimation.

1.1 Scope of Work

The scope of work, as defined in a letter of engagement executed on March 14, 2011 between Uracan and SRK includes the re-evaluation of the classification of an existing mineral resource model for the uranium mineralization delineated by drilling on the North Shore Project and the preparation of an independent technical report in compliance with National Instrument 43-101 and Form 43-101F1 guidelines. This work typically involves the assessment of the following aspects of this project:

- Topography, landscape, access;
- Regional and local geology;

- Exploration history;
- Audit of exploration work carried out on the project;
- Geological modelling;
- Mineral resource estimation and validation;
- Preparation of a mineral resource statement; and
- Recommendations for additional work.

1.2 Qualifications of SRK

The SRK Group comprises over 1,000 professionals, offering expertise in a wide range of resource engineering disciplines. The SRK Group"s independence is ensured by the fact that it holds no equity in any project and that its ownership rests solely with its staff. This permits SRK to provide its clients with conflict-free and objective recommendations on crucial judgment issues. SRK has a demonstrated track record in undertaking independent assessments of Mineral Resources and Mineral Reserves, project evaluations and audits, technical reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with a large number of major international mining companies and their projects, providing mining industry consultancy service inputs.

The original Mineral Resource evaluation was prepared, as described in the June 24, 2010 report, by Abolfazl Ghayemghamian, P.Geo., with the assistance of Marek Nowak, P.Eng. (APEGBC#119958). Mr Ghayemghamian has left SRK and is not responsible for any aspect of this disclosure. The compilation of this technical report, updating the classification and verification of the estimation was completed by Mr. Marek Nowak, who is an independent Qualified Persons, as this term is defined by National Instrument 43-101. Additional contributions to the report were provided by SRK employees Mike Johnson, P.Geo., Dr. Wayne Barnett, Pr.Sci.Nat., and Dr. Adrian Dance who reviewed a metallurgical report by SGS. Contributions were also included from Marc Simpson, P.Geo., and Gordon Chapman, P.Geo., both of Uracan.

Dr. Jean-Francois Couture, P.Geo. (OGQ#1106 and APGO#0197) of SRK undertook a site visit on February 25, 2010. Dr. Couture is a member of the Ordre des Géologues du Quebec. He has also reviewed the content of this technical report. By virtue of his education and relevant work experience, and membership to recognized professional associations, Dr. Couture is an “Independent Qualified Person” as this term is defined by the National Instrument 43-101.

Dr. Couture is a Principal Geologist with SRK based out of the Toronto, Canada office and has been employed by SRK since 2001. He has been engaged in mineral exploration and mineral deposit studies since 1982. Since joining SRK, Dr. Couture has authored and co-authored independent technical reports on several exploration and mining projects in Canada, United States, China, Kazakhstan, Northern Europe, South America, West Africa and South Africa.

Dr. Gilles Arseneau, P.Geo. (APEGBC#125480) of SRK, and Dr. Couture reviewed drafts of this technical report prior to its delivery to Uracan as per SRK internal quality management procedures. Dr. Arseneau did not visit the project.

1.3 Basis of the Technical Report

This technical report relies on information and data provided to SRK by Uracan, including an exploration database with detailed assay and geology data. SRK reviewed and performed reasonable independent checks and validations on a portion of the Double S zone exploration database. SRK has no reason to doubt the reliability of the information provided by Uracan.

The authors relied on information from the following:

1. A technical report prepared by Jean Lafleur and filed on June 30, 2006
2. A technical report prepared by Ron Parent, P. Geo. and filed on August 25, 2008
3. A technical report prepared by Mark Jutras, P. Geo. and filed on June 11, 2009
4. A metallurgical report prepared by James Brown, P. Eng. and Ian Todd of SGS and dated March 2, 2011

In addition, several internal company reports prepared by Uracan were used, detailing drilling results of the Double S zone, as well as other reports on the subject property. While exercising all reasonable diligence in attempting to check and confirm such information, the authors have determined that it generally appears to be of reasonably good quality and it was accepted as useful information for establishing a database of background information for this study.

2 Reliance on other Experts and Declaration

SRK‟s opinion contained herein and effective July 4, 2011 is based on information provided to SRK by Uracan throughout the course of SRK‟s investigations, which in turn reflect various technical and economic conditions at the time of writing. Given the nature of the mining business, these conditions can change significantly over relatively short periods of time. Consequently, actual results may be significantly more or less favourable.

SRK is not an insider, associate or an affiliate of Uracan, and neither SRK nor any affiliate has acted as advisor to Uracan or its affiliates in connection with this project. The results of the technical review by SRK are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

SRK has performed an independent verification of land title and tenure as summarized in Section 3 of this report. SRK did not verify the legality of any underlying agreement(s) that may exist concerning the licenses or other agreement(s) between third parties relating to the North Shore property.

SRK was informed by Uracan that there are no known litigations potentially affecting the North Shore project.

3 Property Description and Location

The North Shore Property consists of 16 claim blocks covering 100,229.68 hectares or 1,002.3 km^2 located in the Havre St. Pierre, Aguanish and Natashquan corridor along the North Shore of the Gulf of St. Lawrence (NTS 12K/11 and 12; 12/L06, 07, 08, and 09) (Figure 3.1). Table 3.1 lists the claims comprising the North Shore Property and their locations are outlined in Figure 3.2 and Appendix B.

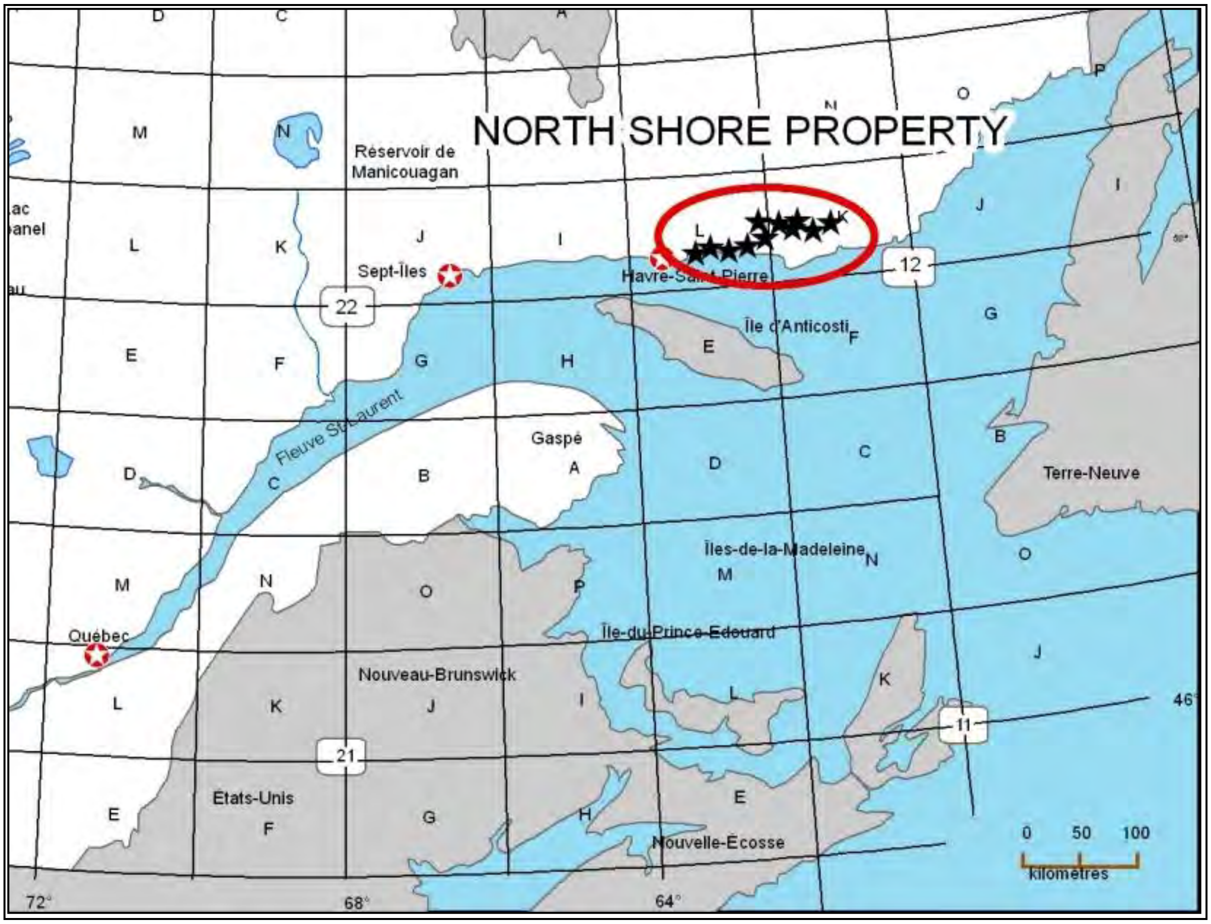


Figure 3.1: Regional Map showing the location of Uracan Resources Ltd. Claims (black stars) on the North Shore of the Gulf of St. Lawrence in Quebec

Table 3.1: List of Claims, North Shore Property

	Claim N°	Area (ha)	Area (km²)	Work Credits	Work Necessary for Renewal	Required Fees for Renewal
Costebelle A	345	18,896.29	188.96	$65,697.37	$414,000.00	$17,940.00
Costebelle B	90	4,914.40	49.14	$16,632.74	$108,000.00	$4,680.00
Costebelle C	394	21,009.18	210.09	$77,634.31	$465,800.00	$20,228.00
Costebelle D	40	2,188.65	21.89	$7,125.68	$48,000.00	$2,080.00
Costebelle E	74	4,047.03	40.47	$13,798.28	$88,800.00	$3,848.00
Costebelle F	58	3,171.95	31.72	$6,598.98	$69,600.00	$3,016.00
Costebelle G	97	5,305.79	53.06	$9,711.70	$116,400.00	$5,044.00
Highway	15	604.73	6.05	$6,370.86	$15,900.00	$702.00
Pontbriand A	89	4,453.79	44.54	$18,384.61	$102,600.00	$4,472.00
Pontbriand B	53	2,911.10	29.11	$99,781.50	$63,600.00	$2,756.00
Pontbriand C	27	1,480.88	14.81	$3,907.17	$32,400.00	$1,404.00
Pontbriand D	130	7,137.97	71.38	$126,848.68	$156,000.00	$6,760.00
Turgeon A	416	22,225.56	222.26	$9,475,414.88	$496,900.00	$21,346.00
Turgeon B	12	422.52	4.22	$9,834.40	$12,300.00	$546.00
Weegee	89	1,459.84	14.60	$379,578.65	$59,500.00	$2,314.00
	1929 claims	**100,229.68**	**1002.30**	**$10,317,319.81**	**$2,249,800.00**	**$97,136.00**

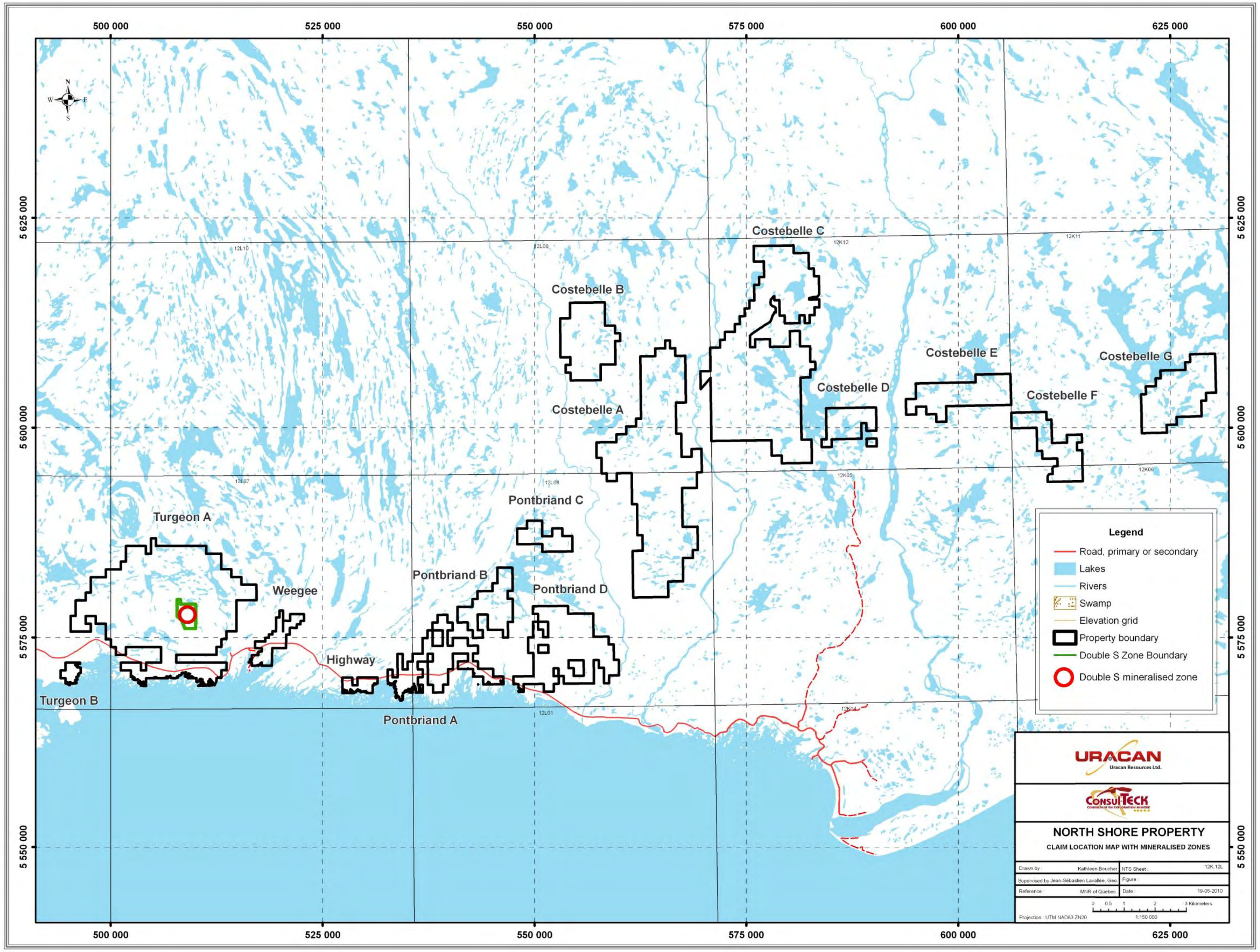


Figure 3.2: Claim Location Summary Map

3.1 Land Tenure and Underlying Agreements

On July 27, 2006, the Company (Uracan) signed an option agreement with Sheridan Platinum Group Limited (“Sheridan”) whereby the Company has purchased a 100% interest in the Lac Turgeon, Wee Gee, Pontbriand and Costebelle properties (the “North Shore Properties”; Figure 3.2) located in Quebec (the “North Shore Acquisition”).

The Company has paid Sheridan $2,000,000 and has issued it 350,000 common shares of the Company. The Company granted Sheridan a Net Smelter Royalty (“NSR”) of 3% in the first 2 years after commencement of commercial production, increasing to 5% thereafter. By making a payment of $3,000,000 within the first 30 days after commencement of commercial production, the Company has the right to reduce the NSR to 1.5% for the entire term.

Effective January 1, 2008, the Company began making advance royalty payments of $25,000 per quarter. As at January 31, 2010, the Company has paid Sheridan a total of $250,000 in advance royalty payments.

In addition, Uracan and its contractors (Jean Sebastien Lavallee and Consulteck) have staked additional claims in the areas surrounding the Sheridan claims as part of the property package. Uracan owns 100% of these claims.

The property has not been legally surveyed. The boundary of each claim block is defined precisely by map cells by the GESTIM claim management system of the Ministère des Ressources Naturelles et de la Faune du Québec (“MRNQ”) www.mrnfp.gouv.qc.ca/mines/index.jsp).

Should any future application be made for a mining lease(s) on this property, it would be possible to obtain all necessary surface rights and permits from the MNRQ. There are no known environmental or land claim issues pending on the North Shore Property.

4 Accessibility, Climate, Infrastructure and Topography

The Turgeon Lake, WeeGee, Highway and Pontbriand claim blocks (Figure 3.2) on the North Shore Property can be easily accessed via Provincial Highway #138 joining Montreal to Natashquan, via Sept-Iles, Havre St-Pierre, Aguanish and Natashquan. In general, access to these claim blocks is excellent between June and October, and the main outcrops can directly be reached using all-terrain vehicles (4x4 ATV‟s, multi-wheeled ARGO‟S) suitable for swamps and marshes.

Sept-Iles is located 285 km to the west is the main administrative center, where heavy machinery, fuel, and other equipment can be easily assembled. The regional hydro-electric grid runs east-west across the claim blocks.

Specialized mining equipment would most probably be obtained from Montreal or Val d'Or. Mining expertise exists in the Sept-Iles and Havre St. Pierre areas, mostly from large open pit mining for iron and titanium.

The north-east Costebelle claim blocks are less accessible due to their location further north. However, this area can be accessed via helicopter and/or float plane. Heli Excel Inc. has a base at the Sept-Iles airport; whereas float plane service is available in Havre St-Pierre, Aguanish and Natashquan.

Relief is quite variable on the North Shore Property and is characteristic of the Middle North Shore area with low relief and extended swamps (Figure 4.1). Elevations range from 10 to 110 m above sea level on the Turgeon Lake claims.

The central part of the region shows low relief with south-southwest-trending elongated topography, due to the presence of a regional tight anticlinorium geological structure. Numerous south-southwest trending rivers are marked by a dense forest cover. The watershed is oriented toward the south, and the area drains directly into the Gulf of St-Lawrence.

Figure 4.1: Turgeon Lake Claim Block on the North Shore Property

Relief is greater in the north-east Costebelle sector with the presence of prominent 150 to 170 m north-northeast trending granitic, pegmatitic and quartzitic hills devoid of vegetation. Nevertheless the intervening valleys contain a thick cover of spruce trees (Figure 4.2). Several sectors show severe tree blow downs, likely due to high wind conditions.

Figure 4.2: Costebelle Claim Block on the North Shore Property

The immediate vicinity of the North Shore Property is not populated. The population is concentrated in fishing villages along the Gulf of St-Lawrence, now linked by Highway #138. Most of the people are employed in the tourism, forest and fishing industries. The climate experienced along the north shore of the Gulf of St. Lawrence, is one of contrasts; the short summer is warm and humid, with frequent rain showers, the winters are long and severe with snowy and windy conditions and temperatures to -25°C. Annual precipitation at Natashquan, 26 km east of Aguanish, is 113 cm, mean July temperature is 14.5°C, January, -15.5C° (Climate Canada website). Mineral exploration work utilizing heavy equipment, in particular drilling, can be conducted on a year-round basis, but is best accomplished in late winter, when bogs and lakes are deeply frozen and equipment can be moved without severe damage to the terrain.

The vegetation is also characteristic of the Middle North Shore region, with scattered forest and extended swamps to the south and denser forest to the north, showing spruce, larch, and deciduous birch and poplars. Fauna comprises moose, caribou, wolf, fox and bear, as well as birds and fishes, characteristic of north-eastern Canadian fauna.

5 History

The following sections, starting from Section 5 and ending with Section 10, are to a large extent excerpts from previous reports.

5.1 General History

The following text is taken from Lafleur (2006) which used Ostensoe (2006) and Ciesielski (2005) as source material.

The area east of Havre-St.-Pierre and North Shore of the Gulf of St.-Lawrence was identified in 1947 as having radioactive materials that is higher than crustal averages. Prospecting with the aid of early Geiger counters ensued and many areas of interest were identified and, in some cases, explored by means of detailed surveys and a few diamond drillholes.

Early searchers were both dismayed and discouraged by revelations of the presence not only of uranium but also of high proportions of thorium. The latter, often coupled with high content of decay products of potassium, created radiation patterns similar to those generated by uranium minerals and could result in grossly misleading impressions of the uranium content of the underlying rocks. Geiger counters were supplanted in the 1960"s by scintillometers that also measured the abundance of gamma rays but which yielded more precise information concerning the total strength of the gamma radiation field and, with some instruments, separate read-outs for uranium, thorium and potassium.

Portable spectrometers came into use in the 1970"s and are popular today due to their accuracy, reliability and their ability to discriminate between the various sources of gamma radiation. Instrument counts in the field (cps or counts per second) are seldom sufficiently reliable and discriminating to allow definition of uranium contents in the underlying rock formations and, although they are an excellent prospecting tool, their indications of elevated uranium contents must be confirmed by chemical analyses. Additionally, gamma radiation is severely dampened by surficial materials such as water, snow, soils, and rocks. Uranium and the products of its weathering are highly soluble and mobile under normal near-surface conditions and consequently the primary uranium minerals may be depleted from outcrops.

The Geological Survey of Canada in 1947 conducted an airborne radioactivity survey in the North Shore. Flight lines were oriented east-west, with 5 km spacing and results were published in Open File Map 271. It is apparent that the survey attracted prospecting attention to the area. The Quebec Department of Mines (now called MRNQ) in the mid-1950s conducted geological mapping work in the North Shore area that was published in 1956 and 1957.

The discovery of uraninite and pitchblende in pegmatite of the Turgeon Lake Intrusive Complex in 1967 precipitated a major staking rush by a large number of junior companies (Smith, 2005). This event was followed in 1975 by a second staking rush, this time dominated by major companies such as Denison Mines Ltd., Imperial Oil Ltd. and Uranerz.

Attention returned to some of the major pegmatite bodies in the mid-1980"s, and the last significant look at exploration possibilities in the region was a brief and inconclusive study of the entire Wakeham stratigraphy by Cogema Inc. in 2000 (Genest, 2000), in an attempt to find Olympic-Dam look-alikes. The Sheridan Platinum Group and associates recognized the large untested uranium potential of the Complex and environs, and began to acquire a land position in 2004. This land package formed the central portion of the current Turgeon “A” claim block.

The geochemical and structural characteristics of the Turgeon Lake Intrusive Complex make it amenable to large scale, but albeit low grade uranium mineralization. The uranium mineralization generally occurs as fine disseminations and splashes along fractures of uraninite and pitchblende, both in pegmatites and granites. The uranium is generally accompanied by intense fracturing, brick red hematized feldspars, greenish smoky quartz, biotite and magnetite. Smith (2005) described the very patchy nature of the uranium mineralization, which tend to be lens-like and lie in conformity with foliation. The scale of these lenses ranges from a few meters to at least 350 m by 80 m. Large numbers of showings were identified in the course of the first staking rush in 1967, for example, at least 26 in the Tanguay Lake – Petit Lake corridor (Lac Tanguay, Double S and Lac Petit Occurences) of the Turgeon “A” claim block.

These showings were subsequently reworked by Denison in 1975 (Smith, 2005), and included other older discoveries such as the Grandroy-Uranium Occurrence. In 1975, Denison drilled 1,370 m in 30 m vertical holes on a 60 m grid over the Lac Petit and Double S Occurrences on the Turgeon “A” claim block, as well as trenching 5 km to the southwest along within the corridor (Chan Zone, located due east of the Corneille River, halfway between Turgeon and Tanguay Lakes).

Drill results from the detailed grid drilling indicated that the uranium mineralization was not uniform over the 3 m assayed intervals, but rather restricted to point sources and narrow bands. The best uranium zone extended in a 50° direction, measuring 400 m in length by 60 m in width. Typical assay intervals from the grid drilling were 0.015% U_3O_8 over 28 m, 0.023% U_3O_8 over 29.5 m, 0.017% U_3O_8 – too low for Denison"s arbitrary cut-off of 0.025% U_3O_8 for open pit purposes, but of sufficient interest for Denison to acknowledge that the Lac Petit Occurrence area contained substantial near surface tonnage averaging over 0.015% U_3O_8 (GM 31871).

The Chan Zone area was found to be highly radioactive with total cps readings of 4 to 8 times background. Threshold counts were taken from one trench and 13 pits. The trench read from 0.026% U_3O_8 to 0.113% U_3O_8. All pits in the area, except for two, returned higher than 0.03% U_3O_8 according to the report on the Chan zone (Smith, 2005).

The Double S Occurrence (located south of Petit Lake) returned radiometric reading averaging background, with many local pod-like anomalies greater than 0.030% U_3O_8. One trench returned 0.053% U_3O_8 over 5 m, and a second trench 6 m returned greater than 0.023% U_3O_8. Core assay results suggested tabular lenses dipping to the north at 50°.

The 1976 field program focused on the Chan Zone, but also included a number of 1 m drillholes – 77 on the Chan Zone, 40 at the Lac Petit Occurrence, 49 on the Double S Occurrence, 115 on the Lac Tanguay Occurrence (South Zone) and 96 on the Middle Zone, just east of the Chan Zone.
(GM 32615 as reported in Smith, 2005).

A detailed scintillometer survey was carried out over the Chan Zone in 1976. The cps readings when converted to percent U_3O_8 were found to be exceptionally good compared to all other sectors surveyed in a similar manner in 1975. The western portion of the Chan Zone, measuring 450 m by 150 m, and trending 140°, contained numerous reading over 0.025% E U_3O_8. Maximum readings of 0.20%, 0.22% and 0.23% E U_3O_8 were recorded. Many anomalous zones were directly bounded by overburden, hence anomalies may very continue further than previously reported. Individual anomalies were shaped as irregular pods measuring several meters to several tens of meters in length (GM 32615).

The Grandroy-Uranium Occurrence, discovered in 1967, is also of interest due to its relatively higher uranium grade. Three trenches approximately 25 m apart straddle a pegmatite-granite contact, and returned values of 0.24% U_3O_8 over 13.7 m, 0.217% U_3O_8 over 47.9 m and 0.238% U_3O_8 over 24.4 m. Three vertical drillholes were completed in the general vicinity of the trenches, but returned trace uranium. The suggestion was made that the trenches were parallel to vertical shears, hence nothing in the vertical drillholes, and there was no follow up work. Denison subsequently reported very high cps in the old trenches (GM 22972, GM 31871).

Cogema under took a major re-evaluation in the late 1990‟s of the uranium potential of a 20,000 km^2 segment of Quebec‟s North Shore covering much of the Wakeham Basin (Genest, 2000), and the North Shore Property in NTS 12K and 12L. Cogema had previously worked the district in 1978 (post-Denison era), and has focused its attention on uraniferous pegmatites and granites from the Turgeon Lake Intrusive Complex and other intrusives in the sector.

The period 1978 to 1998 saw much regional work done in the Wakeham Basin – 100% of all airborne and ground geophysics done in the Basin, 96% of all geochemical surveys, 64% of all MRNQ‟s field work, 87% of all prospecting work realized since the early 1900‟s were completed on NTS map sheets 12L/06, 07, 08, 09, 10 and 11, exactly where the North Shore Property‟s Turgeon, WeeGee, Pontbriand and Highway claim blocks are located. Cogema had concluded early in their study that the Wakeham Basin area had been abandoned since the discovery of the very high grade uranium deposits of the Athabasca Basin in Saskatchewan (e.g. Cigar Lake) in the mid-1970‟s.

Four of the six priority areas identified by Cogema for uranium mineralization are covered by the North Shore Property. These include the Caron Lake Deformation Zone and the Costebelle Lake occurrences from the Highway and Pontbriand “A”, “B” and “C” claim blocks; occurrences of Turgeon Lake Intrusive Complex from the WeeGee “A” and “B” claim blocks, and the Turgeon “A”, “B” and “C” claim blocks. Cogema sampled nine outcrops from the North Shore Property, seven of which are located on the Turgeon “A” claim block and one on the north east Costebelle “B” claim block.

5.2 Historic Mining

No recorded hard rock mining has occurred on any of the company‟s claims.

6 Geological Setting

The following text is taken mostly from Lafleur (2006) as source material.

The North Shore Property is located in the Grenville Province of the Canadian Shield. The Grenville experienced the last Precambrian episode of orogenic mountain building accompanied by folding. Although the rocks had, for the most part, been involved in the earlier Kenoran, Hudsonian and Elsonian orogenies, the extensive reworking that occurred in Grenville time imposed high grade regional metamorphic effects that erased much of the evidence of the earlier poly-metamorphism. The Grenville Province extends for more than 2,000 km along the north shore of the St.-Lawrence River and ranges from 300 to 600 km wide. It forms the south-eastern part of the Canadian Shield, from Labrador (northeast) to the Great Lakes (southwest).

Archean rocks of the Superior Province and Paleoproterozoic rocks of the Otish Basin and New Quebec Orogen are separated from the parautochthonous belt by the Grenville Front, a major and complex structure oriented northeast-southwest. The Front is characterized by a northwest verging thrust movement, and by late strike-slip movements with a sharp well delineated metamorphic boundary with the Superior Province. The Grenville features complex, irregular folded structures, numerous gneiss domes and basins, and variable intrusive rocks ranging from gabbro to alkali-rich rock. The Allochthonous Monocyclic Belt comprises allochthonous terrains that underwent a single orogenic cycle. In the immediate vicinity of Sept-Iles, Grenvillian rocks are intruded by the Eocambrian (565 Ma) Sept-Iles Layered Igneous Complex. Farther east, in the Baie des Moutons area, an Eocambrian syenite complex intrudes Grenvillian bedrock. Parts of the Grenville Province have attracted the attention of companies engaged in uranium exploration.

These areas include the Wakeham Sedimentary Basin and the granitic Turgeon Lake Intrusive Complex in the Middle North Shore region. In addition, the Caron Lake area (NTS 12 L/07, L/08 and L/09), constitutes a prospective area to reinvestigate, with Mesoproterozoic rocks of the Wakeham Basin. Several copper-gold-sliver (BJB, Lac Véronique) and nickel-copper (Nord de la Crête White) showings and occurrences are known and documented from previous prospecting campaigns, field studies and geological mapping. The Lac Caron area contains the kilometre-wide Lac Caron shear zone, which extends for about 75 km along strike. It is a brittle-ductile deformation zone characterized by the emplacement of a series of pegmatite sills and quartz veins.

6.1 Regional Geology

Rocks of the North Shore Property (Figure 6.1) are dominantly migmatite and gneiss, gneissic textured S-type granite; areas of strongly metamorphosed sandstone, arkose (now quartzite and quartzofeldspathic gneiss); mafic volcanic rock (now amphibolites); aplitic to coarse grained granite and granitic gneiss with pegmatitic dyke. The quartzite and quartzofeldspathic gneiss belong to the Wakeham Basin.

Regional structures trend north to northwest, and display large-scale curvilinear folding. The core areas of such folds expose granite. The gneisses are variously draped around the cores or have been partially consumed by the granite pluton. Locally, the granitic gneisses are very weakly or only moderately strongly foliated and the distinction between metamorphic and plutonic phases is made with difficulty. Granitic rocks in the region are true granite, varying in colour from white to pink and granularity varying from very fine to medium-grained more uniform granite to extremely coarse-grained, very heterogeneous pegmatitic granite and pegmatite. The granitic rocks exhibit interior quartz veins, centimetre to almost meter sized individual feldspar crystals, large bronze to black coloured biotite euhedra, magnetite and/or ilmenite grains.

The pegmatitic granite and true pegmatite tend to show higher and more uniform radio-activity. The migmatites were likely formed by re-crystallization of, and introduction of, pegmatitic and granitic solutions into pre-existing sedimentary rock and, to a lesser extent, amphibolite. There is evidence of at least two ages of pegmatite development – one, an older group, probably related to the gneissic granite, generally forms narrow sills and dykes that cut the meta-sedimentary rocks and migmatite, and feather out along the prevailing foliation and schistosity of those metasedimentary rock. The second, younger group of pegmatite cuts indiscriminately across the older pegmatite and has well-defined sharp contacts with the enclosing rocks.

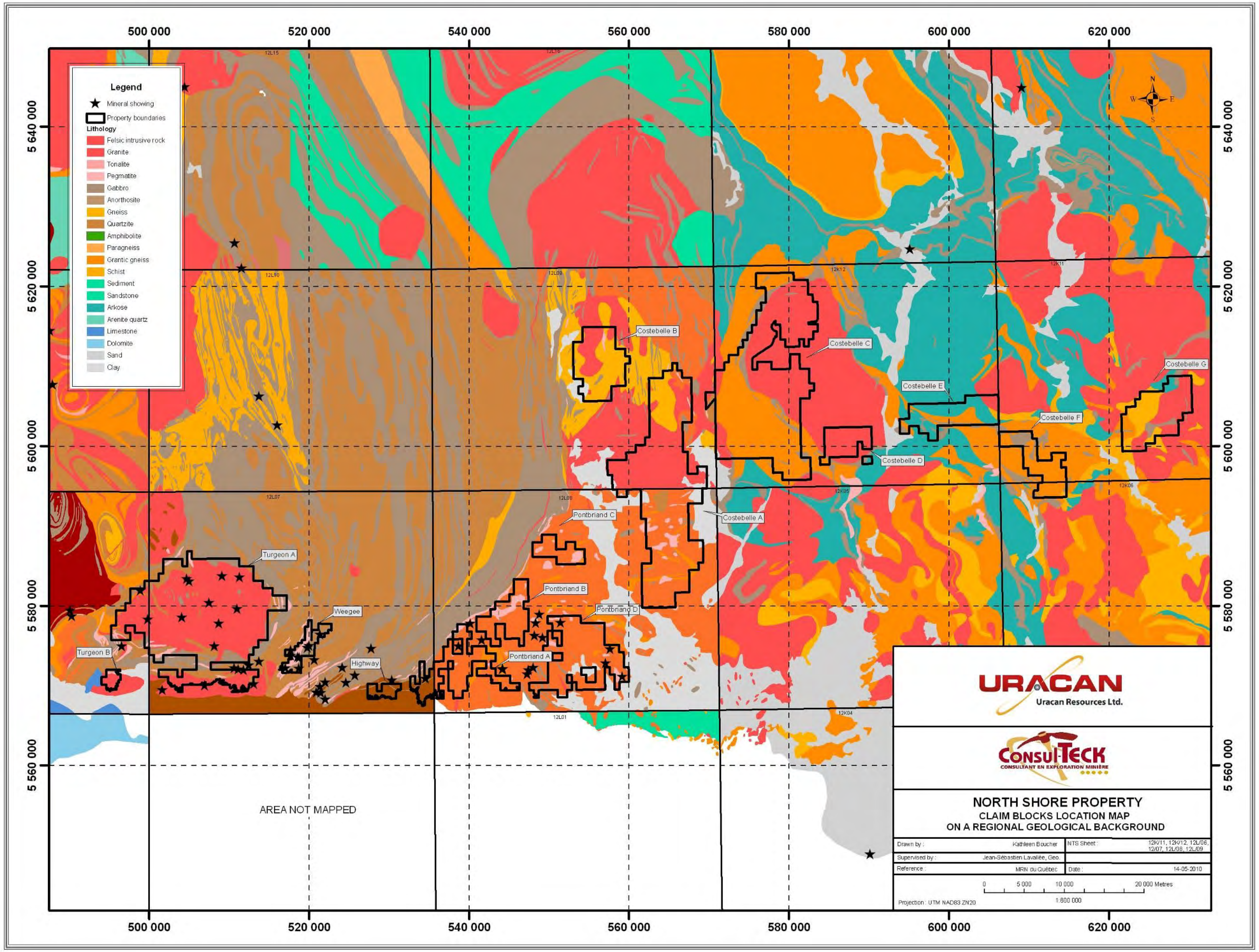


Figure 6.1: North Shore Claims Regional Geology

6.2 Property Geology

6.2.1 Lithology

The geology of the area has been previously studied by many companies. The reader is referred to Lafleur (2006) for further information. The key areas focused upon in this report are dominated by intrusive granitic rocks (granitic pegmatite, Potassic feldspar and Plagioclase granite, granitic gneiss, augen granite, and metagabbro) that penetrate an older sequence of siliciclastic supracrustal rock mainly comprised of the paragneiss and quartzite sequence known as the Wakeham Group (Figure 6.2).

Bedrock exposures of the study area form part of the Turgeon Lake intrusion, a late to post-Grenvillian granitoid intrusive complex. The age of the Turgeon intrusions of the „Suite felsique de la Galissonniere‟ of the Natashquan domain have been determined to be between ca. 990 and 950 Ma. (Wodicka et al., 2002, Contribution no 2002113 à la Commission géologique du Canada, quoted by C. Bohm (2007)). Work undertaken as part of an undergraduate thesis on the Double S zone by Brodie (2008) has U-Th-Pb monazite age determinations of 961+/-7 Ma and 962+/-9 Ma, for the granite and pegmatite, respectively.

6.2.2 Structure

Faulting and fracture systems and/or shear zones trending north-northwest and east-northeast are apparent in outcrop and defined by topographic lows (often coincident with small lakes and drainages) on the Turgeon claim group. The complex structures in the area are primarily brittle, with some local ductile deformation exhibited as foliation and gneissosity, within the granitic gneiss rock unit in core. The emplacement of the Turgeon Lake intrusive complex is the last evident geological episode. Fold-like structures such as the Double S trend should be attributed to intrusive rather than torsional structural influences. Xenoliths of paragneiss (likely part of the ~1.50 Ga Wakeham metasedimentary group) are located along the periphery of the intrusive bodies, and occasionally within them. The xenoliths are generally paragneiss, very fine-grained quartzite and lesser quartz arenite with a minor pelitic component that are deformed (foliated and internally folded) with variable evidence of metamorphism.

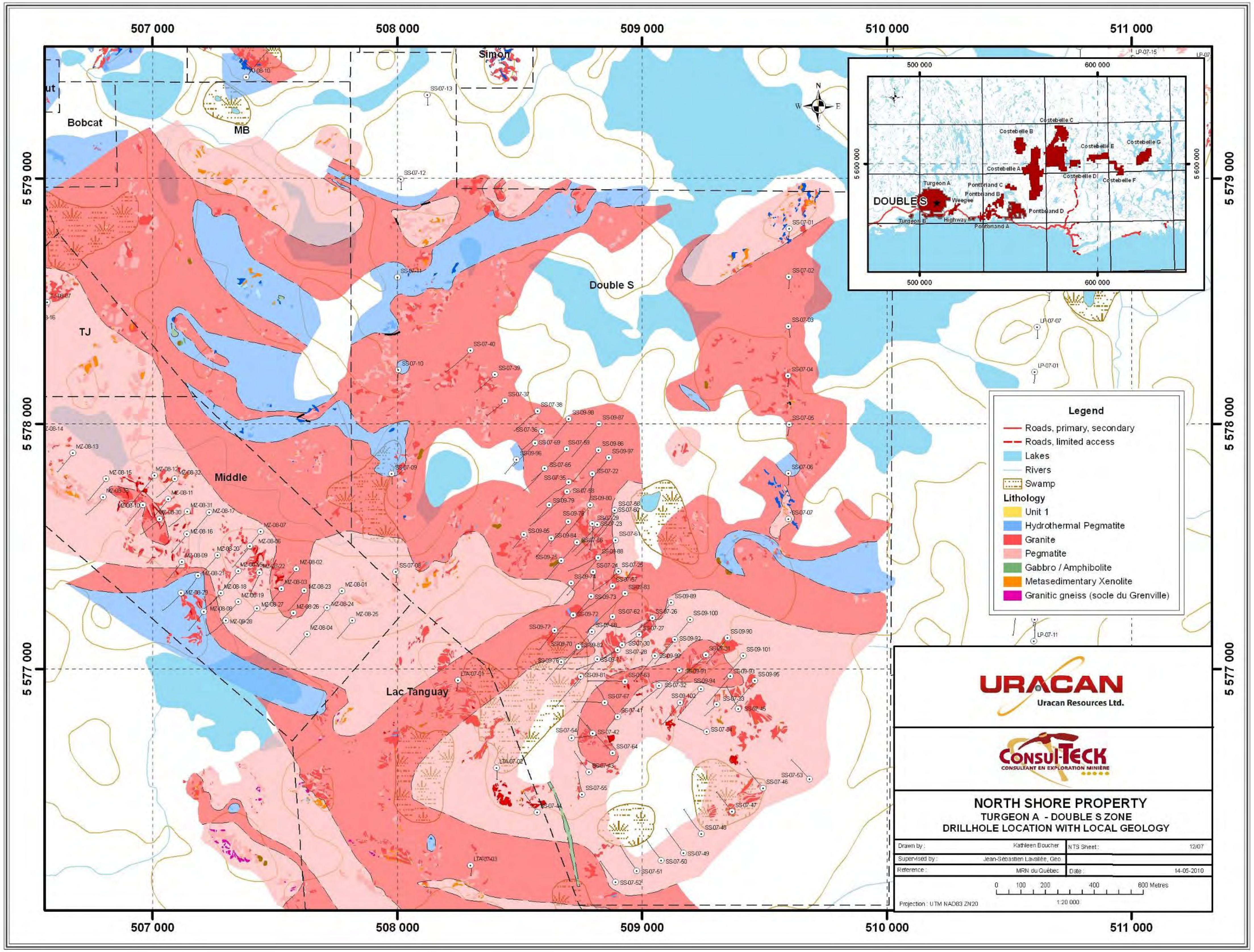


Figure 6.2: Double S Zone Local Geology Map with Drillhole Locations

7 Deposit Types

The following text is taken mostly from Lafleur (2006) as source material.

The main exploration target for the North Shore Property is uranium. Previous work in the area has focussed on identifying significant uranium mineralization. A number of small and discrete uranium showings were identified in the 1950‟s and 1960‟s, but without describing a satisfactory genetic model to the occurrences.

Based on work to date by Uracan and its consultants, the company is of the opinion that the uranium mineralization is genetically related and is akin to two possible deposit models, not necessarily exclusive of each other: Model 1 - Vein and Disseminated Intragranite Uranium Deposits, and Model 2 - Iron Oxide Breccias Uranium (-Copper-Gold) Deposits. The main focus to date by Uracan has been on the Rössing style mineralization (Model 1), described below.

7.1 Model 1 - Vein and Disseminated Intragranite Uranium Deposits (McMillan, 1996; Birkett and Simandl, 1999)

The classic uranium vein deposits consist mainly of pitchblende with only minor amounts of associated metallic minerals in a carbonate (calcite and dolomite), quartz, hematite, potassic feldspar, albite, muscovite, fluorite and barite in veins. These deposits show affinities with, and can grade into, multi-element veins which have significant pyrite, silver, cobalt-nickel arsenides, chalcopyrite, galena, sphalerite, native gold, platinum group elements and bismuth.

They generally occur in post-orogenic continental environments, commonly associated with calc-alkaline felsic plutonic and volcanic rock. The economic deposits appear confined to areas underlain by Proterozoic basement rock. Mineralization is deposited in open spaces within fractures, breccias and stockwork, commonly associated with major or subsidiary, steeply dipping fault systems. Many deposits are associated with continental unconformities and have affinities with unconformity-associated uranium deposits. Chlorite, hematite and feldspar are the main alteration minerals in the host rocks. A few of the intrusive-hosted deposits are surrounded by silica-depleted, porous feldspar-mica rock called episyenites or sponge-rocks, the later typical of the Gunnar Deposit in Saskatchewan. In most cases, the hematite alteration is due to oxidation of ferrous iron bearing minerals in the wall rocks during mineralization.

None of the deposits are older than 2.2 Ga years. Specific host rocks include per-aluminous two-mica granite and syenite, felsic volcanic rock, and older sedimentary and metamorphic rock. The stratabound, disseminated and pegmatitic occurrences of uranium are commonly found in the later setting. The uranium-rich veins tend to have affinities to felsic igneous rocks. Mineralization may be tabular or prismatic in shape generally ranging from centimetres up to a few metres thick, and rarely up to about 15 m. Mineralization tends to have depth potential to a few hundred metres, however some deposits extend from 700 to 2,000 m down dip. Disseminated mineralization is present within the alteration envelopes.

Examples of the older environment deposits include the Ace Fay, Verna and Gunnar of the Beaverlodge area, Saskatchewan, and the Christopher Island, Kazan and Angikuni district, Baker Lake area, Nunavut. Individual deposits can be small (under 100,000 tonnes) with grades of 0.15% to 0.25% U_3O_8; however, districts containing several deposits can aggregate considerable tonnages. The large Ace Fay-Verna system produced 9 million tonnes grading 0.21% U_3O_8 from numerous orebodies over a length of 4.5 km and to a depth of 1,500 m. The Gunnar deposit produced 5 million tonnes grading 0.15% U_3O_8 from a single orebody.

Uranium, and sometimes any, or all, of nickel, cobalt, copper, molybdenite, bismuth, arsenic and silver are good pathfinder elements which can be utilized in standard stream silt, lake bottom sediment and soil geochemical surveys. Even stream and lake bottom water samples can be analyzed for uranium and radon. In addition, the inert gases helium and radon can often be detected above uranium-rich sources in soils, as well as groundwater and springs. Standard prospecting techniques using sensitive gamma-ray scintillometers and spectrometers detect uranium mineralization in float trains in glacial tills, talus or other debris remains the most effective prospecting methods. Because most mineralization and deposits do not contain more than a few percent metallic minerals, electromagnetic and induced polarization surveys are not likely to provide direct guides to mineralization. VLF-EM surveys are useful to map fault zones which are host the veins. Magnetic surveys may be useful to detect magnetite destruction in hematite altered wall rocks, as well as mapping out fault structures. Secondary uranium minerals are typically yellow and are useful surface indicators.

Uranium can also be associated with “nephelinitic and ultramafic carbonatite-hosted” deposits. These deposits contain economic amounts of niobium, tantalum, rare earths, phosphates, copper, titanium, strontium, fluorite, thorium, magnetite and uranium. Uranium is a by-product element. Carbonatites are the main source of the products. Grades and tonnages vary from 300 million tonnes at 3% Nb_2O_5; 60 million tonnes at 20% P_2O_5; and 19 million tonnes grading 0.66% Nb_2O_5.

Carbonatites generally occur in a continental environment and are related to large scale fractures, grabens or rifts. Intrusions are early Precambrian to Recent in age. Host rocks are varied, including calcite, dolomite or ankerite rich carbonatites, magnetite-olivine-apatite-phlogopite rocks, nephelinites, syenites, pyroxenites and peridotites. Country rocks are of various types and metamorphic grades. Carbonatites are commonly found over broad geological provinces, but individual intrusions may be isolated. Annular topographic features can coincide with carbonatites.

Only intrusive carbonatites are associated with mineralization in economic concentrations which occur as primary igneous minerals and replacement deposits (intra- and extra-intrusive veins or zones of small veins). Carbonatites form small, pipe-like bodies, dykes, sills, small plugs or irregular masses. The typical pipe-like bodies have sub-circular or elliptical cross-sections and may be up to 5 km in diameter. Magmatic mineralization within pipe-like carbonatites is commonly found in crescent-shaped and steeply dipping zones.

A fenitization halo or akali metasomatized country rocks commonly surrounds carbonatite intrusions. Alteration mineralogy depends largely on the composition of the surrounding rocks. Typical minerals include sodic amphibole, wollastonite, nepheline, aegerine augite, pale brown biotite, phlogopite and albite – typically in zones of de-silicification with the addition of iron, sodium and potassium. Fenitization increases the size of target in regional exploration for carbonatite-hosted deposits. Uranium and Thorium associated with barite and fluorite are considered indirect rare earths indicators. Magnetic and radiometric expressions and sometimes anomalous radon gas concentrations furnish primary targets. Geochemical signatures include resistant niobium and phosphate minerals in soils and stream sediments; and fluorine, thorium and uranium in waters.

The Unconformity-Related Uranium Deposits tend to be related to shelf facies meta-sedimentary rocks (of amphibolite or granulite metamorphic facies) of Early Proterozoic age (graphitic or sulphide-rich meta-pelites, calc-silicate rocks and meta-psammites), regolith and overlying sandstones of

Middle Proterozoic age, having a strong association with regional faults. The early Proterozoic host rocks can be retro-graded amphibolite facies metamorphic rocks on the flanks of Archean gneiss domes. Dykes and sills, commonly diabase and lamprophyre occur in some districts.

Ore bodies may be tabular, pencil-shaped or irregular in shape extending up to a few kilometres in length. Most deposits have a limited depth potential below the unconformity of less than a 100 m. Most deposits fill pore space or voids in breccias and vein stockwork. Some may be exceptionally rich in uranium with areas of massive pitchblende (i.e. in Saskatchewan‟s Athabasca Basin). Individual deposits are generally small, but can be exceedingly high grade, up to several percent U_3O_8. The median size of 36 Saskatchewan and Australian deposits is 260,000 tonnes grading 0.42% U_3O_8. Some deposits are exceptionally high grade such as the Key Lake Gaertnr-Deilmann deposits (2.5 million tonnes grading 2.3% U_3O_8), Cigar Lake deposits (900,000 tonnes grading 12.2% U_3O_8) and McArthur River (1.4 million tonnes grading 12.7% U_3O_8; McMillan, 1998).

Exploration guidelines for these deposits are not dissimilar to the vein-type uranium deposits, since both can occur in the same area. Standard techniques using sensitive gamma ray scintillometers to detect mineralization directly in bedrock or in float trains in glacial till, frost boils, talus or other debris derived from uranium mineralization remain the most effective prospecting methods. Airborne and ground radiometric surveys detected near surface uranium deposits and their glacial dispersions during the early phases of exploration of the Athabasca Basin, Currently, deeply penetrating ground and airborne electromagnetic surveys are used to map the graphitic argillite associated with most deposits. The complete spectrum of modern geophysical techniques (i.e., gravity, magnetic, magneto-telluric, electromagnetic, induced polarization, resistivity) can be utilized to map various aspects of structure as well as host rock and alteration mineral assemblages (i.e., chlorite, hematite, kaolinite and silica) in the search for deeper uranium targets.

Uranium, nickel, cobalt, arsenic, lead and copper are good pathfinder elements which can be utilized in standard stream silt, lake bottom sediment and soil surveys. Stream and lake bottom water samples can be analyzed for uranium and radon. In addition, the inert gases helium and radon can often be detected above a uranium-rich source in soil gas surveys, as well as groundwater. In Saskatchewan, lithogeochemical signatures have been documented in Athabasca Group quartz arenite for several hundred metres directly above the deposits and in glacially dispersed boulders located down ice. The signature includes Boron (in dravite) and low, but anomalous uranium as well as Potassium and/or Magnesium clay mineral alteration (such as illite and chlorite).

At the other end of the spectrum, in terms of very low grade uranium deposits, is the disseminated Rössing-type uranium mineralization, based the Rössing Deposit (approximately 300 million tonnes grading 0.03% U_3O_8 – Kinneard and Freemantle 2009) in Namibia (Figure 7.1 and Figure 7.2). Rössing is one of the largest open pit uranium mines in the world operated by Rio Tinto. The deposit is the fifth largest producer of uranium and accounts for 7.7% of the current total world uranium production.

The Rössing deposits contain uranium mineralization within crustally derived sheeted leucogranite dykes (migmatitic syenite and alaskite) emplaced under upper amphibolite facies metamorphism (Figure 7.2). The dykes vary from fine grained to pegmatitic, with the latter being the most common. Dykes range from narrow concordant (most common) to discordant bodies, often very large irregular bodies that transgress the foliation or are part of the tectonic fabric (banding) within the country rocks. Country rocks are generally well deformed, metamorphosed and migmatized, consisting originally of sedimentary succession and minor meta-volcanic rock.

Contact metamorphism is seen between dykes and host rock. The bulk of the economic mineralization at Rössing is contained in alaskite dykes that are preferentially emplaced into pyroxene-garnet gneiss and amphibolite comprising the northern zone, and into amphibole-biotite schist, marble and cordierite-biotite gneiss, that comprises the central mineralization zone located on the northern limb of the mine synclinorium. The alaskite, although chemically uniform, are widely spread beyond the limits of the mine sequence but are not uniformly uraniferous. Most are barren, some only leanly, and still less is sufficiently rich to support mining.

Adjacent to the mine occurs the " SH " area, a small 1 km long granite consisting of coalesced dykes and are characterized by elevated (but sub-economic) uranium. In the Rössing open pit, (the "SJ" area), uranium is hosted by uraninite with secondary uranium minerals, including beta-uranophane. Conversely, in the "SH" area, uranium is hosted mainly by the pyrochlore-group mineral, betafite. The leuco-granites from the "SH" area exhibit lower absolute H_2O, lower H_2O/CO_2 and lower total fluids compared to those from the "SJ" area. Fluid geochemistry and large ion lithophile (LIL) element data suggest that the economic "SJ" uranium is linked to high H_2O and total fluid contents.

Exploration for Rössing-type mineralization should include both airborne and ground radiometric surveys. Particular attention to detection of radiation in peat and organic rich soils must be taken.

Concentration of uranium trapped in organic matters is frequent and can lead to investigate false uranium anomalies in uranium-poor rock, the contrary is also true. A focus should be made on upper amphibolite to granulite metamorphic rocks, in paragneiss dominated successions, principally those which have undergoing a high degree of partial fusion (migmatites), near evolved (potassium and sodium-rich) intrusions. Attention must also be paid to metamorphic terrigeneous products with graphitic-biotitic-pyritic schist which can be a potential source of uranium prior to migmatization.

A soil and rock sampling survey should be done to correlate uranium with associated metals (Mo, Li, Th, REE"s and Be) in S-type granitoids or pegmatites.

Figure 7.1: Rössing Open Pit (M. Simpson photo, 2009)

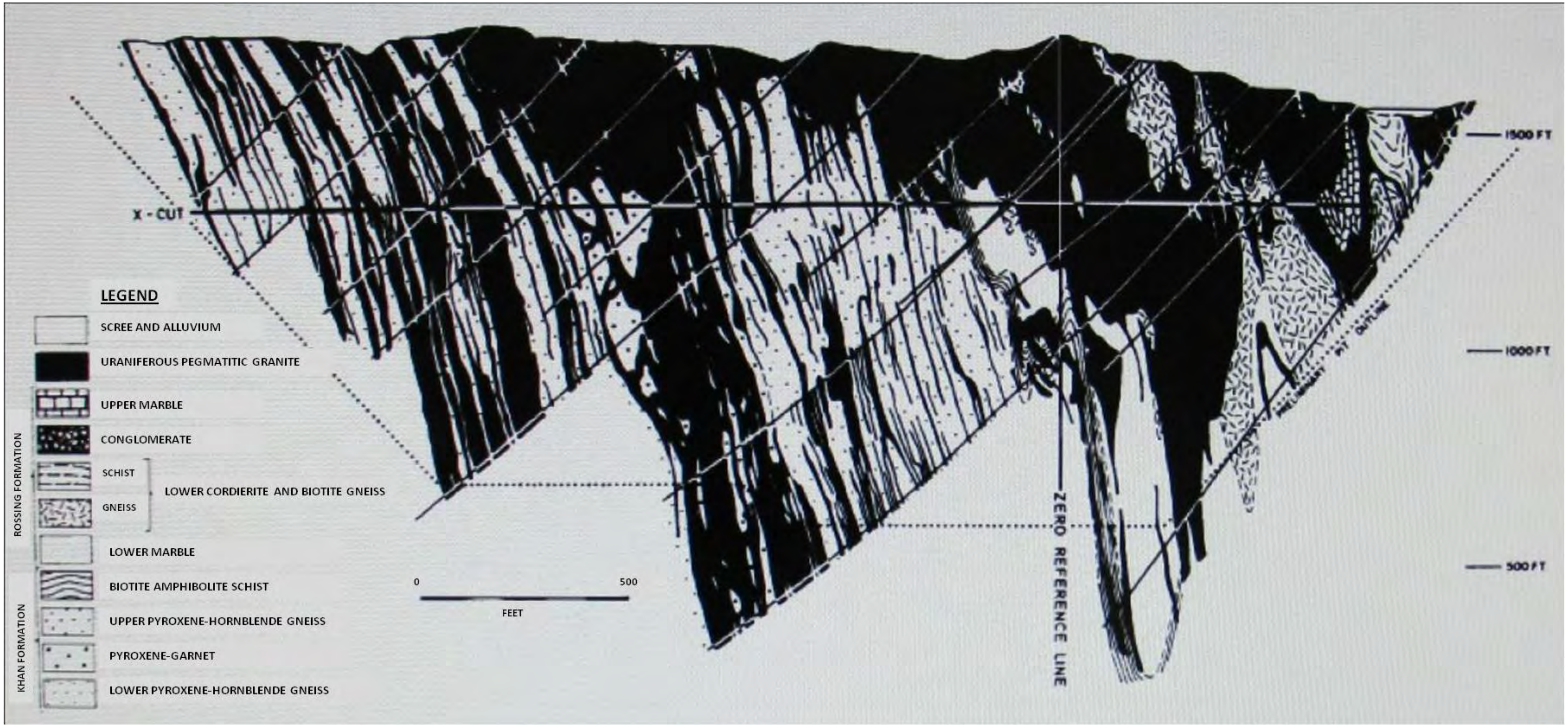


Figure 7.2: Drill Section Zero showing geology, boreholes and bulk sampling crosscut through the Rossing Uranium Deposit (from Berning et al.,1976)

8 Mineralization

The following text is sourced and modified from Bohm (2007), Parent (2008) and Renou (2008).

The uranium mineralization noted to date on the North Shore property is hosted by felsic intrusive bodies, dominantly granite and pegmatite, as well as lesser tonalite, syenite and monzonite, generally described in the field as granites. The amount and density of granitic pegmatite and pegmatitic granite in the main granite intrusive phase seems to correlate directly with the number and density of high uranium mineralization (> 1000 counts per second). Pegmatite is generally more abundant, more voluminous and closer spaced in the central parts (core) of the circular to ovoid intrusion, where the shallowly dipping pegmatite dikes and sills/sheets in variably altered granite and syenite form resistant, topographic highs. Uranium mineralization tends to be highest in zones around these pegmatitic cores, where the abundant pegmatite and altered granitic rocks „grade‟ into the main granite. Uranium mineralization seems to generally taper off toward the intrusion margins in the granite.

The level of uranium mineralization seems to be dependent or correlative with the amount of characteristic „smokey‟ grey quartz along the interface of pegmatite and granite. Together with 20-60% grey quartz, coarse grained (aggregates) of biotite and/or magnetite occur in the uranium mineralized zones and may be, in addition to grey quartz, useful indicator minerals for uranium mineralization.

Late- or post-intrusive, pink, potassic feldspar rich megacrystic pegmatite, in comparison, is generally void of grey quartz and contains very low to insignificant uranium concentration.

The observation that uranium mineralization appears to occur around the core of ovoid intrusive bodies is also borne out by the airborne radiometric anomalies. When viewed on a macro scale a number of these large oval bodies with radiometric highs around them are noted throughout the Turgeon Lake intrusive body. It is possible that the entire Double S trend (Double S, Middle Zone, TJ Zone) is part of the rim of one of these oval intrusive bodies. Field observations from Bohm (2007) indicate that indicators favourable for increased uranium mineralization include:

- contact zones of granitic pegmatite with granite and syenitic granite; commonly located along the peripheries and shoulders of pegmatitic “knobs”;
- highest uranium mineralization tends to be in pegmatitic veins and pods in granite, near the contact with the main pegmatitic bodies;
- mineralized pegmatitic veins and pods commonly contain abundant (>20%) grey quartz and variable amounts of coarse grained black to brown biotite and metallic dark grey magnetite crystals and/or aggregates;
- pegmatitic quartz-feldspar stringer veins in granite and syenite are locally mineralized within up to 10-20 cm from the vein;
- (reactivated) fracture faults that are rimmed by late, pegmatitic and/or hydrothermal mineral growth (quartz, albite, biotite, magnetite) are locally mineralized within a few decimetres into the granite host; and
- alteration of pink-beige or beige-white granite to pale pink or brick red syenite (episyenite; see comment below) is commonly more intense in uranium-bearing areas and near abundant pegmatite.

Field indicators suggesting low uranium content are:

- homogeneous, massive to variably foliated biotite granite along the margins of intrusive bodies;
- granite and/or granitic pegmatite with high density and amount of metasedimentary rock xenoliths, commonly along the margins of the intrusive bodies; and
- homogeneous, massive, megacrystic, potassic feldspar rich pegmatite bodies.

Essentially the mineralization is of the following two mineral species:

Uranothorite: found occasionally in all intrusive types as the main mineral indicator of high U-Th concentrations. Euhedral cubic crystals are systematically associated with other accessory phases as biotite, magnetite, apatite and zircon on microcline joints. Uranothorite shows diffuse limits when included in chloritization halos. In this context, staged oxidation generates at first uraninite exsolution visible by a micro-textured polished surface followed in some samples by a complete replacement of original phases by a mixture of clays and amorphous material.

Uraninite: finely crystallized perfect cubes or irregular grains disseminated around biotite and preferably in clear albite overgrowth with muscovite and chlorite. Pure uraninite grains are surrounded by zircon and apatite and show locally and intergrowth relation with monazite. Another occurrence is under the form of a few microns exsolutions in partly corroded uranothorite crystals. Corrosion level of both phase is variable and can let only phantoms of the original phase replace by an assemblage of clays and amorphous material. Any uranyl oxy-hydroxide and coffinite have been detected by the ionic microprobe around uraninite.

Field observations from the 2008 and 2009 mapping programs have been used to create a preliminary stratigraphic column of the Lac Turgeon granitic intrusion shown in Table 8.1. The stratigraphic column includes four (4) principal units, subdivided locally into secondary units. In general, the granitic pegmatite has intruded the Wakeham Group and forms a large sill (lopolith) with a cap rock, core and root system. At the top of the sequence (Unit 4), large xenoliths are slightly assimilated or not assimilated while at the bottom of the sequence (Unit 2), smaller xenoliths are partially to nearly completely assimilated (Figure 8.1). The core of the sill is termed the “Typical Double S granite” (I1B f to c) is pink heterogeneous granitic pegmatite with a relatively high background concentration of uranium.

Table 8.1: Preliminary Stratigraphic Column of Lac Turgeon Granitic Intrusion

Description	Spatial References	Minerals and Alterations	Unit
I1G, m to c/large xenoliths: Pink or salmon, medium to coarse grained (potassic feldspar) pegmatite with 10-15% quartz pods and variable amount of small to large fresh xenoliths (gneiss granitic, quartzite and/or paragneiss)	MB-08 (fracture in large xenolith, max 40 000 cps).	Quartz vein, Radioactive black stringer, Magnetite Uranophane	4b
I1G, m to c, salmon or partially white: Salmon or partially white, medium to coarse grained pegmatite (similar to unit 4b) this unit maybe absent.	-	-	4a
Δ, contact breccias: I1G with angular clasts displaying graphic texture in larger feld. clasts and fine grained granite injections. Slightly brecciated cataclastically (this unit maybe absent).	SS-6, SS-7 and SS-13 (max 13000 cps)	Slight to severe hematite alteration, silicification.	3d
I1B, f to c (with pegmatoid dykelets): Fine to coarse grained, locally porphyritic, granite displaying rare magmatic layering, partially metamorphosed xenoliths with magnetite rims may be present. Sporadic, fine to coarse grained, pink or white dykes, irregular pods and/or dykelets of pegmatite, and smokey quartz veining may be present	SS-01 to SS-04 (radioactive dyke, max 5000 cps) SS-05 (radioactive unit, max 17000 cps) MB-04, MB-05 and SS-12 (I1B, typical Double S max 7000-8000 cps) CH-07, MZ-01 fracture zones, subvertical	Weak silicification; 15-20% smokey qtz; trace mag; trace pyrite, uranophane yellow alteration product	3c
I1B, f to m (grey or brown): Fine to medium grained, grey or brown homogenous granite.	DDH: SS-09-97 (0.75 to 54.75m) and CH-08-06 (158.8 to 177.7m) and channels: SS-08 and SS-09	Thoriferous granite	3b
I1G, f to c and very coarse: Pink or pink and white, fine to coarse grained, occasionally very coarse grained, pegmatite sill (this unit maybe absent).	DDH: AJ-08-09 7.3 to 98.2 m.	Weak to moderate magnetite, hematite and smokey qtz	3a
Δ, Hydrothermal brecciated (white) pegmatite: Hydrothermal pegmatite with angular clasts, mosaic texture, and 5-10% biotite books, the cataclastic breccia contains mineral fragments between 1mm to 50cm and the brecciation is variable between slight and severe, (this unit is not always present, so the contact may be gradual). Hydrothermal pegmatite is a field term that is subject to further refinement.	MB-01 to MB-03, MB-9, MB-10, CH-01, CH-02, CH-03, SS-10 and SS-11 (radioactive breccias, max 37200 cps)	Silicification ; 5-20% biotite books; yellow alteration product of uranium, 1-2 % sulphides (Pyrite and Molybdenum)	2c
I1B (w), f to c: Leucogranite , white colour, fine to coarse grained	50 m west of channel MB-04	-	2b
H peg (w), f to c: White, fine to coarse grained pegmatite, 50-90% plagioclase, local graphic texture, 10-15% quartz pods, 1-5 % biotite. Small xenoliths that are partially or highly digested and display plastic deformation.	High readings (max 12 500 cps) are found associated with hematization or phenocrysts of magnetite.	Uranophane	2a
Feeder dykes: Hosted in gneiss granitic (volcanic and porphyry ?) or sedimentary rocks of Wakeham Group. Dykes are pegmatoidal, display variable composition, and are sometimes sub vertical in orientation. Local hornfelsed rim in paragneiss.	Some dykes are radiometric	-	1

Figure 8.1: Assimilated Xenolith with Plastic Deformation in Hydrothermal Pegmatite (white), Chan Zone

Unit 2 and Unit 4a consist of white or partially white pegmatite found near the margin of the intrusion, with Unit 4a generally associated with the upper margin while Unit 2 is associated with the lower margin. A brecciated and cataclastic textures are sometimes noted near the contact zones (see Figures 8.2 to 8.4). Feeder dykes intruded into the Wakeham Group feed the lopolith at the bottom of the sequence. The main phase of uranium mineralization appears to be associated with a late-stage secondary mineralization phase of veining and brecciation (Figure 8.5), or is a co-magmatic phase in the core of the intrusion. The preliminary stratigraphic column should be revised after additional geochemical and geochronologic studies are carried out.

Figure 8.2: Contact breccias between a pink pegmatite clast and fine grained granite matrix, typical of Double S Zone

Figure 8.3: Primary magmatic layering in mixed granite/pegmatite, main outcrop Double S Zone

Figure 8.4: Cataclastic H. Peg (w) with hematized matrix, channel MB-01

Figure 8.5: Late-stage quartz/pegmatoid vein, main outcrop Double S Zone

9 Exploration

Prior to conducting any field program, an intervention permit (Permis d'intervention) with the Forestry Section of the MRNQ (Ministères des Rresources Naturelles, Section Forêt) was obtained. Activities conducted under these permits are described in this report.

As part of the permitting process a work plan was submitted to the MRNQ. Minimal to no surface disturbance was caused by the various work programs as all access was from existing roads or by helicopter. There was no timber removal from the property as part of the surface prospecting and sampling program. Limited surface disturbance and timber cutting was carried out as part of the various diamond drilling programs carried out on the property. This work is described in the section on drilling in this report.

As part of the above noted permits, no official consultation was required to be carried out with the First Nations in the area prior to 2009. However, contact was made with representatives of the local First Nations communities and a number of First Nations people were hired. This ranged from 2 to 5 people in an overall crew size ranging from 12 to 30 people, or up to 40% of the workforce on the property was First Nations. New regulations have been put in place in Quebec that has added a First Nations consultation component as part of the permitting process.

In addition a significant number of people have been hired from the various communities on the North Shore to work on various phases of work carried out on the North Shore Property, from Parent (2008).

9.1 2006 Surface Exploration

Between early June and late August 2006, a field exploration reconnaissance program was carried out. The work was carried out by personnel employed by ConsulTeck Exploration of Val d‟Or, Quebec. ConsulTeck was contracted by UFM Ventures (later renamed Uracan Resources Ltd.) to carry out this exploration work on the property.

This initial phase of work was aimed at verifying the known historic occurrences noted in assessment files for the area. This work was done by widely spaced traverses either accessed by road or using helicopter support to mobilize the crews. Sampling was completed either with grab samples or rock saw channels. These sampling locations were taken on areas with anomalous values as indicated by scintillomter counts. As well, regional sampling was carried out over broad areas of the property to outline any other areas with significant anomalous uranium and thorium concentrations. These historic occurrences were prioritized, and not all historic occurrences were visited during this phase of work due to time constraints.

No mapping was carried out during this phase of work other than basic sample descriptions for each sample. This was done due to the reconnaissance style work being carried out, and the large number of areas that needed to be assessed in a rapid fashion.

This work program confirmed the existence of potentially significant uranium and thorium mineralization on many of the historic showings. Several showings were shown to have potential to host large mineralized bodies. These showings were prioritized as drill targets for the winter 2007 drill program, discussed in the Drilling Section in this report.

The work was generally in line or better than historic values as outlined in the assessment reports for the various areas. Uracan utilized rock saws which allowed for better sample representation of the mineralization present on the outcrops. Many of the historic operators described their results as uranium equivalents from the scintillometer counts per second. This was a widespread practice at the time, with laboratory assays only carried out on a limited basis or not at all. Uracan‟s work was all completed using laboratory analysis and as such is much more representative of the actual uranium content of the host rocks.

As well, Uracan was the first property holder in the area to be able to accumulate a large enough property position to assess the areas, particularly the Turgeon Lake intrusion as a whole rather than as a small piecemeal assemblage of claims. Uracan‟s claims cover the entire areal extent of the Turgeon Lake intrusion, allowing an overview of the various occurrences and geophysical anomalies outlined. Several broad trends were noted, including what was initially termed the Double S trend and the Lac Petit trend.

Uranium mineralization was noted as occurring predominantly in pegmatite and granite bodies, often along the contacts between these units. Gneisses were generally noted as barren bodies. Overall trends were roughly outlined, however due to the reconnaissance nature of the work no definitive trends were outlined.

9.2 2007 Surface Exploration

Between late May and late September 2007, a field exploration reconnaissance program was carried out. The work was carried out by personnel employed by ConsulTeck Exploration of Val d‟Or, Quebec. ConsulTeck was contracted by Uracan to carry out this exploration work on the North Shore property.

This work was a reconnaissance prospecting and sampling program on the Turgeon Lake, Pontbriande and to a limited extent the Costebelle claim groups. In addition to following up the results of the 2006 reconnaissance program, various anomalies from the 2006 airborne geophysics program were assessed for uranium potential.

On the Turgeon Lake claim group, prospecting and sampling were carried out on areas to the southeast and northwest of the Double S zone, which was outlined in the 2007 drilling program. The aim of this work was to outline uranium mineralization along an airborne anomaly which extends from the main Double S zone to the south and northwest of the main drilled zone.

Elsewhere on the Turgeon Lake claim group other areas of historic work as well as what were defined as significant airborne anomalies were assessed by prospecting for uranium mineralization. The sampling was carried out by taking grab samples and to a lesser extent channel samples where outcrop was such that no grab samples could be taken. The majority of 2007 samples were grab samples.

This prospecting and sampling program was successful in outlining numerous occurrences of significant surface uranium mineralization in many areas of the property. Several of the airborne anomalies with coincident uranium mineralization in the sampling were defined as potential diamond drill targets for future programs.

No mapping was carried out during this phase of work other than basic sample descriptions for each sample. This was done due to the reconnaissance style work being carried out. A lack of qualified geologists also contributed to the decision to employ prospectors and geological technicians for this work.

This work program confirmed the existence of potentially significant uranium and thorium mineralization on many of the historic showings. The work was generally in line or better than historic values as outlined in the assessment reports for the various areas. Uracan utilized rock saws which allowed for better sample representation of the mineralization present on the outcrops. Many of the historic operators described their results as uranium equivalents from the scintillometer counts per second. This was a widespread practice at the time, with laboratory assays only carried out on a limited basis or not at all. Uracan"s work was all completed using laboratory analysis (see Section 12) and as such is much more representative of the actual uranium content of the host rocks.

9.3 2007 Geological Mapping

Geological mapping on the property during the 2007 exploration program consisted of detailed 1:2000 scale mapping completed on the Middle Zone area of the Double S trend (See C. Bohm"s report on his mapping work). Due to a lack of personnel no other detailed mapping was completed in 2006 and 2007.

Dr. Christian Bohm was engaged by Uracan to perform detailed mapping on selected areas of the property to develop a better understanding of the controls on mineralization and the geological relationships of the various units in the area. This work was carried between September 27 and October 6, 2007

The mapping program was started in order to get a better geological understanding of areas with anomalous uranium mineralization and coincident airborne radiometric anomalies within the Double S trend. Due to time constraints the mapping was focused on the Middle Zone area. This work outlined several field criteria for uranium mineralization listed in Section 8 which have the potential to focus exploration on areas in the field with higher potential for uranium mineralization.

9.4 2008 Surface Exploration

The following text is taken mostly from Jutras (2009) as source material.

In 2008, geologists and technicians from Consul-Teck Exploration Inc. and Resource-Eye Services Ltd., along with independent geological consultants mapped known uranium mineralized zones within the main Lake Turgeon North Shore property. The mapping activities were undertaken to find, delineate and record any areas with economic potential observed during the exploration phase of the program.

The objectives of the summer geological work program were to provide detailed, 1:2,000 scale geological bedrock mapping of outcrop exposures in the known core Middle, TJ, Lac Petit and Chan zones. Focus was directed at mappable rock units of the felsic granitic rocks of the Turgeon Lake intrusive complex. It was viewed that this mapping would determine relationships between uranium grade, geometry and any visible structures. It was also thought that controls on mineralization could be understood from insights provided by the geological mapping.

Mapping at a 1:2,000 scale was commenced when the program started in early June, 2008. Initially, geologists concentrated upon mapping the Main, TJ and Chan zones while exploration crews fanned out over known and new areas within the claims. Please refer to Appendix 4 of Jutras (2009) for full geology maps.

Two new zones, Jeff and Andrew (collectively known as the AJ Zone), were identified north of the Chan Zone and immediately south of the historic Turgeon Est (507478E / 5580378N) zone. In some zones, where indicated, localized non-surveyed radiometric grids were run with hand held scintillometers, spectrometers and in some cases a Niton hand held XRF instrument. These areas were targeted due to surface assays, potential deposit size and other favourable characteristics.

The location of the Jeff and Andrew zones was followed by a series of new uranium zones discoveries including the Simon, Simon North, BobBlowOut and a number of other smaller occurrences. Many of the new zones have uranium mineralization hosted by dominantly creamy-white, plagioclase-rich “hydrothermal” pegmatite. Uranophane is markedly more visible and present within this rock type.

Discovery of new zones (Simon, Simon North, and the AJ zones) located within the Lac Turgeon claim group was followed up by 1:2,000 scale mapping where warranted. Rock saw channel sampling was completed in and marginal to all of these uraniferous areas. Results of the channel sampling can be found in Appendix 7 of Jutras (2009).

Previous mapping performed by Dr. Christian Bohm during the 2007 field season was directed at the Middle and South /Hinge zones southwest and south of the Double S zone. During the 2008 season the Middle Zone mapping was extended to the northwest and Bohm‟s 2007 mapping which was integrated into the present mapping scheme. GPS locations, structural measurements and scintillometer readings were taken on the main core property areas prior to the commencement of diamond drilling.

Niton hand held XRF field instruments, RS-125 spectrometers and GR-110 scintillometers were used to detect and analyze mineralization found during prospecting. Each GPS unit was downloaded daily with specific GPS points recorded in EXCEL spreadsheets and individual traverse lines recorded in Garmin Geosource format.

9.5 2009 Surface Exploration

The following text is taken mostly from Cloutier (2009) as source material.

The objective of the summer work was to map at a scale of 1:2000 and prospect with scintillometers, determine favourable targets for channel sampling and if possible, determine any similarities with Namibian uranium deposits.

Mapping at 1:2000 scale was carried out on a total of eight zones:

- Double S
- MB Zone
- Middle Zone South
- Chan West
- Lac Turgeon
- Grandroy
- Lac Tanguay
- AH West

Specific detailed descriptions of the individual mapped areas and additional information can be found in Cloutier (2009). Please refer to Figure 6.2 for the geology and interpretation of the Double S zone and surrounding area.

10 Drilling

Drilling results between 2007 and 2009 has been used for resource estimation described in this report. The equipment used was custom built hydrostatic drills utilizing NQ rods and bits provided by the drilling contractor companies, Forage Nordic and Forages Performax.

At Double S zone, the drill was moved between drill sites using a Caterpillar D6 bulldozer with extended width tracks. Drill rods, down hole mud and supplies as well as other support equipment was moved using a sloop. At Grandroy and Turgeon Est. the drill and its related equipment were moved using a helicopter.

Fuel and other supplies were mobilized by snowmobile during winter months and by helicopter during summer months. Minimal fuel was stored at the drill site, and fuel containment and spill abatement supplies were present at all drill sites. Drill crew traveled to and from the drill with snowmobiles during the winter and either by helicopter or 4 wheel drive ATVs during the summer months.

All drill sites were inspected after completion of the work to ensure that they were clean and clear of drill related debris. Most holes have the casing retained in case of the need to deepen the existing drill hole.

10.1 2007 Drilling

The following text is sourced from Parent (2008).

Diamond drilling was carried out on the North Shore Property during 2007 in two phases. The work was completed by Forage Nordic of Val d‟Or, Quebec, under contract to Uracan. Phase one totalled 7,587.1 m of drilling in 58 boreholes.

Phase one started on February 2, 2007 and was completed on April 29, 2007. Phase two of the 2007 drill program started on May 27, 2007 and was completed on November 30, 2007. A total of 12,923.7 m in 45 boreholes and two drill hole extensions was completed during this phase of drilling.

All drill sites were inspected after completion of the work to ensure that they were clean and clear of drill related debris. Most holes have the casing retained in case of the need to deepen the existing drill hole. During the Phase 1 drilling, the majority of the drill holes were completed to 125 m in depth. Based on the assay results received from this initial phase, several of the Phase 1 drill holes were deepened during Phase 2, and the drill holes completed during Phase 2 ranged in depth from 200 to 476 m.

The depth of drilling during the first phase was completed to a predetermined depth to outline the potential for near surface bulk tonnage style mineralization suitable for open pit bulk tonnage mining. This depth was increased during the second phase of drilling as a clearer idea emerged as to the controls and orientation of the mineralization present.

10.2 2008 Drilling

The following text is taken mostly from Jutras (2009) as source material.

Diamond drilling was carried out on the North Shore Property during 2008 in eight areas within Turgeon A claim group. The work was completed by Forage Nordic of Val-d‟Or, Quebec, under contract to Uracan.

All drill sites were inspected after completion of the work to ensure that they were clean and clear of drill related debris. Most holes have the casing retained in case of the need deepen the existing drill hole.

Winter drilling in 2008 incorporated the use of two drill rigs. One drill focused on exploration along the Double S trend while the other drill focused on the reconnaissance drilling of new targets in other areas of the property. A total of 22,711.5 m of drilling in 110 boreholes was completed.

10.3 2009 Drilling

Diamond drilling was carried out on the North Shore Property during 2009 in three areas within Turgeon A claim group. The work was completed by Forage Nordic of Val d"Or, Quebec, and Forages Performax Inc., also of Val-d"Or, Quebec, under contract to Uracan. The 2009 diamond drill program was supervised by Marc Simpson P.Geo., Exploration Manager for Uracan Resources Ltd. A total of 45 new drill holes and one drill hole extension (SS-07-62) were completed for 10,025.4 m.

The component of drilling at the Double S zone in 2009 included 33 new drill holes totalling 8,851.5 m and one extension of drill hole SS-07-62 for 148.9 m. The program tested the extents of mineralization along the edges of the Double S zone primarily to the north and south along with infill drilling within the main zone. The results have expanded the zone along the northern and southern extensions.

Overall size of the Double S zone has increased to 1.5 km in length, and up to 750 m in width and the zone still remains open in all directions. Figure 6.2 shows drill hole locations on the Double S zone.

11 Sampling Method and Approach

11.1 Sampling Protocol for Drill Core

The following text is taken mostly from Jutras (2009).

The geological units hosting the majority of uranium mineralization at the North Shore Property are predominantly granitic (granite, syenite, monzonite and diorite), pegmatitic equivalents of the granitic rocks, along with associated metasedimentary gneisses and granitic gneisses. These rock types lend themselves to high rates of recovery, generally greater than 95% recovery in most or all drilled intervals. Lost core is minimal on this project. All drill holes were completely sampled from top to bottom.

At the diamond drill, core was recovered using a wire line core tube system with each run recovering 3 m of drill core. All drilling was conducted using metric drill rods so no conversion from imperial units to metric units is required. All diamond drilling completed in 2007 to 2009 were done using NQ sized drill rods recovering core diameter of 47.6 mm in diameter.

Each core tube is unloaded by the driller‟s helper into core boxes with each box containing 4.5 m of drill core. Each box is lettered with the drill hole number and box number. The end of each 3 m run of core has a marker inserted with the depth of each run marked on it by the driller‟s helper. Once each core box was filled it was closed with a lid which was secured using wire. The core was directly transported to Uracan‟s core logging facility either by a sled pulled by a snowmobile in winter or by helicopter in the summer.

Intervals were “broken out” based on geological similarities such as the same amount of veining. The minimum sample interval was approximately 30 cm and because the drilling was done using NQ sized drill rods, the maximum recommended interval was 1.5 m, with exceptions in limited circumstances. All drill core was sampled to determine the limits of mineralization. All samples were written up in the drill log, and the drill strip logs were completed for each sample. This data was entered in the digital database for use in creating digital cross sections. Sample numbers were taken from the sample tag books from Chemex laboratories. Each sample has a unique number to identify it, and a two part paper tag was put in the box at the beginning of each sample, with one of the two placed in the sample bag with each sample by core cutting personnel.

This sample number was also written on a metal tag that was stapled into the box at the beginning of each sample interval. This metal tag provides a permanent record of the sample location. The sampled interval and number were clearly marked on the drill core with a wax pencil to allow the core cutting personnel to easily identify the sample intervals, and a cut/split line was also drawn perpendicular to the dominant foliation. This clarity minimizes the risk of sampling errors.

All sampled intervals were completed in hand written and digital log formats. Personnel double checked to ensure that the sample numbers and sampled intervals accurately reflected what was actually sampled in the drill core.

During the 2008 and 2009 drilling program at the North Shore Property, all drill holes were sampled in their entirety to define the controls on mineralization on the property, as well as to build a large enough data set to define potential geochemical anomalies associated with mineralized zones.

The drill core was split using a hydraulic splitter system (Services Exploration Enr. Model SE-5H). This has a hydraulically operated blade that applies the blade against the core, causing it to split in half, one half going into the sample bag, the other half replaced into the core box as a sample for future reference.

11.2 Core Logging

Logging core is inherently subjective, and Uracan compensates for that subjectivity by using strict formats, frequent photography, and encouraging open communication between project geologists, the field manager and the Exploration Manager.

When a geologist logged core, units were always named based on the lithology observed. Examples of all main lithological units were available for reference to ensure that all geologists were identifying and naming the units in the same manner. After the units were named based on lithology, the geologists identified the structure, alteration and mineralization. Because the mineralized zones are the most important intervals in the drill hole, all occurrences of uranium mineralization, sulphides, alteration, structures and veining were and noted in a manner that would be relatively simple to interpret.

In order to enhance the database for the project, all core logging personnel read over the logs of other project geologists on a regular basis. This process allowed geologists to see how the others were interpreting and logging the same rocks.

Core logging sheets followed the following format: a summary of information on the hole (location, azimuth, dip, start and finish date, etc.), a description of the core, along with a strip log of geological information. The strip log is critical information for each sample, outlining alteration and mineralization characteristics for each interval. This numeric information is used to create digital cross sections with this information displayed as histograms or line graphs which assist in the interpretation of the mineralized zones. This information is collected for all sampled intervals.

Photography of Core

All drillcore was photographed wet, using a digital camera to provide an additional record for future reference.

Labels were created at the “top” of each core box, showing the “from” and “to” for that particular core box. For NQ sized core, five pictures were taken across a spread of two or three core boxes. The core photos were “stitched” together using commercial photo stitching software (Figures 11.1 and 11.2).

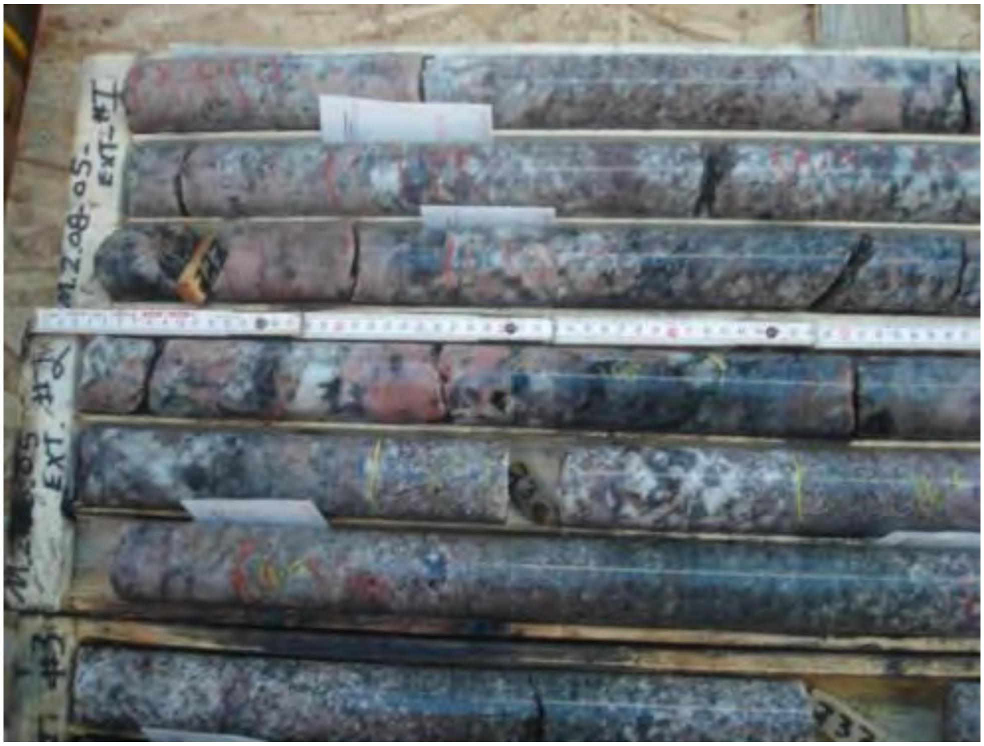


Figure 11.1: Example of diamond drillcore photography - top of core boxes

Figure 11.2: Example of diamond drillcore photography - bottom of core boxes

Geotechnical Logging

Steps were taken to ensure that the tags were correctly placed in the core boxes, and core tags were written correctly and in sequence. If mistakes were encountered, the drill foreman was informed immediately so that action could be taken to rectify the situation at the drill.

Core Box Measurements

After the tags were converted, the “top” and “bottom” depths of the core in the core box was measured and recorded. A metal tag was prepared using aluminum DYMO tape. The drill hole number, box number and contained meterage in each box was written on the metal tag and then stapled to the front of the core box. The box “from” and “to” were recorded on a form and inserted into the drill log file after the hole was completed.

Depth and Recovery Measurements

Core Recovery records the total amount of core recovered over the measured length drilled for each core run. Core losses are an important indication of potentially poor geotechnical conditions, since they most commonly occur in weak or highly fractured zones, which may be important for determining rock mass properties. Rubble, re-drill, or slough, recovered at the top of a core lift that was not in place, is not counted as recovered core and should be discarded or clearly labelled to avoid subsequent misclassification. Core recoveries should not exceed 100 % on any logged interval. Core which was drilled in a previous run can often be identified by marks from the drilling or the core lifter.

The core recovery data collected from the technician was recorded on a form and inserted into the drill log after the hole was completed.

The geological units hosting the majority of uranium mineralization at the North Shore Property are predominantly granitic (granite, syenite, monzonite and diorite), pegmatitic equivalents of the granitic rocks, along with associated metasedimentary gneisses and granitic gneisses. These rock types lend themselves to high rates of recovery, generally greater than 95% recovery in most or all drilled intervals. Lost core is minimal on this project. All drill holes were completely sampled from top to bottom.

11.3 Sample Quality and Distribution of Mineralization

Assay samples are collected on half core split lengthwise using a hydraulic splitter.

Uranium mineralization is thought to be fairly evenly distributed, based on thin section petrography by Renou (2008) and by examining assay results. The sampling method does not introduce a bias.

12 Sample Preparation, Analyses and Security

12.1 Chain of Custody

Once the drill core was split and sealed into plastic sample bags, the bags were placed in groups of 8 to 10 samples into doubled poly bags for transport. These poly bags were also sealed with tape, and they were transported by employees of Consul-Teck Exploration to Havre St. Pierre Quebec. The sealed bags are palletized and shrink wrapped in plastic before being transported by commercial transport truck to ALS Chemex Laboratories in Val-d‟Or, Quebec. ALS Chemex is the laboratory facility used for all assays from the North Shore Property program.

12.2 Sample Preparation and Analyses

Upon arrival at the ALS Chemex facility in Val d‟Or, Quebec, samples are individually weighed (ALS Chemex code WEI-21), entered into their sample control database (ALS Chemex code LOG-22), and have the internal laboratory quality control samples are inserted. (ALS Chemex code PUL-QC). Once these procedures are complete, the samples are then taken to the sample preparation area. They are first crushed to 70% <2mm (ALS Chemex code CRU-31), followed by a riffle split of the crushed sample (ALS Chemex code SPL-21), and one portion of the split material is pulverized to 85% <75µm (ALS Chemex code PUL-31).

The pulverized samples were assayed for 47 elements using a 4-acid digestion followed by Inductively Coupled Plasma Mass Spectrometry (ALS Chemex code ME-MS61) on sub-samples of a minimum 1 g size. These results are recorded and once they pass internal laboratory quality control tests are sent to designated representatives of Uracan for review.

12.3 Analytical Quality Assurance and Quality Control Programs

Uracan considers analytical quality control to be a top priority in any drilling program, and assay information is continually inspected in graphic and spreadsheet format to allow management to detect any sampling or assaying problem.

Uracan purchased two uranium standards from African Mineral Standards in South Africa. Those standards were used as control samples for all drilling samples submitted for assaying. In order to maintain quality control, one duplicate sample representing ¼ of core, one uranium standard and one field blank were inserted into the sample stream, normally with one of each type inserted per group of 40 samples. In sections perceived as high grade additional control samples were inserted that was primarily blank material in order to be certain that no smearing of uranium values occurs. Uracan also relied on the ALS Chemex internal quality control procedures.

Any samples which failed Uracan‟s quality control tests were re-assayed. A failed test would constitute a sample result outside two standard deviations from the reference material mean value, where that sample came from in or near mineralization. At the conclusion of the drilling programs approximately 5% of the samples assayed by ALS Chemex were sent to an umpire laboratory, Saskatchewan Research Council Laboratory, for check assaying.

ALS Chemex is an accredited laboratory with facilities in 20 countries and routinely performs assays for mining companies. The Val d‟Or facility is also in compliance with ISO 9001:2000 for the provision of Assay and Geochemical Analytical Services according to QMI Management Systems Registration. Please refer to www.alschemex.com for further information.

13 Data Verification

13.1 Verification by Uracan

Uracan has a number of internal data checks and verification protocols to ensure the accuracy of the information generated from the field work programs. Internal database verification was carried out to ensure the accuracy of the database. Laboratory data, drill log data, down hole survey data and drill collar data were compiled in a Microsoft Access database which was used to flag any errors for follow up by Uracan and/or its field contractors. Any errors noted were corrected on a case by case basis.

In addition, Uracan carried out checks on drill hole collar locations by field checks using hand held GPS units after each drill hole was completed. As well, all drill holes completed up to April 2009 were surveyed by a professional surveyor. Drill holes completed subsequent to that date have been surveyed using hand held GPS units. This information was checked against the original planned drill hole location to ensure the information on drill hole numbering was correct. No errors in drill hole locations have been noted.

Down hole surveys were also completed on all drilling completed on the property using a survey instrument (EZ Shot) at predetermined depths. Any erroneous readings were removed from the database.

13.2 Verification by SRK

In April 2010, SRK completed an audit of the Uracan analytical quality control data acquired with the sampling of the Double S Deposit This involved analysis of the drillhole and assay database, review of the certificate data received directly from the ALS Chemex and review of assay results for blank, standard and duplicate. The audit was completed by SRK Senior Consultant Mike Johnson, P.Geo.

13.2.1 Site Visit

In accordance with National Instrument 43-101 guidelines, SRK visited the Turgeon project on February 25, 2010 to inspect the property, review recent exploration work, ascertain the geological setting of the Double S uranium deposit and witness the extent of exploration work carried out on the property. At the time of the visit the site was inactive. Dr. Jean-Francois Couture, P.Geo. (OGQ#1106 and APGO#0197) completed the site visit with Mr. Marc Simpson, P.Geo. of Uracan.

During the visit, SRK inspected several abandoned drilling sites. The borehole collars are clearly marked with casing capped and flagged with a metal stake indicating the borehole number. At the time of the visit the unusual low snow cover allowed examining several outcrops exposing the nature of the uranium mineralization associated with pegmatite and granitic rock.

At the base camp, SRK examined core from four boreholes and reviewed briefly with Mr. Simpson, drilling, logging, sampling and other field procedures implemented by Uracan.

SRK did not collect verification samples for independent assaying.

13.2.2 Database Verifications

SRK conducted routine verifications to ascertain the reliability of the electronic borehole database provided by Uracan. All assays in the current database were verified against the independently sourced sample certificates from ALS Chemex. The U_3O_8 values in the assay table were found to match the laboratory certificates. In addition, SRK verified that the conversion of U_3O_8 to uranium was done correctly.

After the review, SRK is of the opinion that the Double S drilling database is sufficiently reliable for resource estimation.

13.2.3 Verification of Analytical Quality Control Data

Uracan made available to SRK the assay results for analytical quality control data accumulated on the Double S zone from 2007 to 2009.

SRK aggregated the uranium assay results for the external quality control samples for further analysis. Sample blanks, and certified reference materials data were summarized on time series plots to highlight any potential failure. Field duplicate paired assay data were analysed using scatterplots and ranked absolute relative deviation charts.

The analytical quality control data analyzed by SRK include external Uracan data and ALS Chemex internal data. The analytical quality control data produced by Uracan are summarized in Table 13.1 and are presented in graphical format in Appendix A.

Table 13.1: Uracan Double S Sample QA/QC Summary

	Number of Uracan Data	**Number of Laboratory Data**
Sample Count: Double S Zone	18,171	
Blanks	485	1,129
Certified Reference Material		
STD-085	24	
STD-086	38	
G2000		931
BL-4		36
UTS-1		26
UTS-3		64
Total CRM	62	1,057
Paired Data		
Field Duplicate	475	
Total QC Samples	**1,022**	**2,186**
Frequency (%)	6%	12%
Umpire checks	559	

Performance of Field Blanks

Field blanks are used to monitor contamination introduced during sample preparation and to monitor analytical accuracy of the lab. True blanks should not have any of the elements of interest much higher than the detection levels of the instrument being used. According to Uracan, true blank samples for uranium are difficult to find due to a high background uranium value for many materials. For the most part, only certified pulp blank material, purchased from CDN Labs was used. However, at one point in the sample program, locally purchased playground sand was used instead of the normal blank material. This data is noticeable in the overall blank analysis as it was more elevated in uranium than the bulk of the blank material. The type of blank material effectively excluded testing for potential errors during sample preparation.

The samples generally all returned values higher than 5 times the detection limit of 0.1 ppm. Three blank samples were found to exceed a somewhat arbitrary uranium value of four ppm and only two of those samples significantly exceeded this threshold. It is entirely likely that at least two of the samples were samples which were mislabelled as blanks when they in fact were real Double S samples. A period of higher values corresponds to the period in which playground sand was used as blank material.

Although the samples are generally too elevated in uranium, the results are sufficiently “low” to indicate that cross-contamination in the samples was not a significant issue. Of the 197 batches of assay analysis, 23 have no blank samples within the batch. In future sampling, one true blank field sample should be inserted every 20 samples so that a more confident blank dataset is available.

ALS Chemex assayed 1,089 laboratory blank samples during the processing of Uracan‟s samples. All assays were below an acceptable threshold of 0.5 ppm.

Performance of Field Duplicates

Duplicate samples are typically collected to monitor sample preparation, as well as homogeneity of the crushed samples. A total of 472 field duplicates were collected as ¼ core samples. Review of the paired assays shows relatively high variability between the duplicate and the original assays (see absolute deviation plot in Appendix A). In addition, there is a slight, but acceptable bias for the original assay to be higher in value than the duplicate assay.

Performance of Reference Material

Reference material control samples provide a means to monitor the precision and accuracy of the laboratory assay deliveries. Uracan used two commercial standards (STD-085 and STD-086) inserted at a low frequency.

The two standards used have low uranium content (Table 13.2). In total, only 62 standards were analyzed. Assay results for the standards assayed by ALS Chemex are summarized on a time series plot presented in Appendix A. This chart shows that four batches of samples contained one standard assaying above the two standard deviation limit generally accepted as a standard failure.

Table 13.2: Uracan Reference Standards

Standard Name	Expected Value (Uranium ppm)	Standard Error (Uranium ppm)
STD-085	263	+/-21
STD-086	127	+/-9.5

Performance of Pulp Duplicates

ALS Chemex sample pulps were sent to Saskatchewan Research Council (“SRC”) laboratory for check assaying. In total, 559 samples were analyzed. In general ALS Chemex assays correspond well to the check assays delivered by SRC, although SRC appears to deliver slightly higher values relative to ALS Chemex assays.

In conclusion, the review of analytical quality control data produced by ALS Chemex and Uracan, suggests that uranium grades can be reasonably reproduced, suggesting that the assays results reported by ALS Chemex are generally reliable for the purpose of resource estimation.

14 Adjacent Properties

There is no adjacent property that is considered relevant to the subject of this technical report.

15 Mineral Processing and Metallurgical Testing

Uracan retained SGS from Lakefield, Ontario to carry out preliminary metallurgical test work on core samples from the various uranium occurrences on the property. The following summary of the testing results was extracted by SRK from the conclusions of a report entitled "An Investigation into Uranium Recovery from the North Shore Property" dated March 2, 2011 (Appendix C):

- *Three composite core samples and one overall composite sample were prepared for metallurgical testing from the TJ, MZ and SS zones of the North Shore property. The composite samples were found to assay between 100 and 130 ppm uranium.*
- *Uranium was effectively leached in gentle agitated bottles from pulverized samples (– 10 mesh) with uranium extraction greater than 85%. Sulphuric acid requirements were moderate at ~20 kg/t.*
- *Under heated agitated leach conditions uranium extraction achieved ~90% with ~30 kg/t sulphuric acid additions. Sodium chlorate was added at a rate of ~1 kg/t to provide oxidation.*
- *The leach liquors were treated by conventional solvent extraction and ion-exchange; however, due to the low uranium tenors results are somewhat inconclusive. Nevertheless the uranium was effectively recovered from the acid solutions by both SX and IX.*
- *The leach residue was neutralized with ~81 kg/t limestone and ~22 kg/t hydrated lime to final pH of about 9. The resultant effluent was quite clean.*

Bottle roll testwork obtained a recovery of 80 to 85% which provides an indication of the amenability of the samples to recovery by leaching. Additional testwork using agitated leaching to mimic tank leaching obtained a recovery of 86 to 91%.

The SGS report recommends that

> *"Future metallurgical testwork should be concentrated on heap leaching due the low grade nature of the* [mineralization]. *Additional bottle roll tests on coarse crushed* [samples] *should be completed to determine to optimum crush size and further refine the reagent requirements. Column testing would eventually be required on larger samples to confirm uranium extractions. This would produce ample leach liquor to optimize the downstream recovery of uranium from the leach solution."*

SRK recommends that additional test work be completed on a range of North Shore samples to better define expected uranium extractions under different processing methods. It appears likely that, if a processing method is being considered involving a coarser feed size and non-elevated temperatures, then the recovery could be lower than that reported by SGS in their test work summary. A review of studies completed on Namibian uranium projects suggests that some level of grinding and/or elevated leach temperature conditions are required to exceed 80% recovery. As no definition of the processing method has been determined, an expected uranium recovery of 90% is being assigned.

16 Mineral Resource Estimates

16.1 Introduction

To the best of SRK‟s knowledge and as earlier described, there are currently no title, legal, taxation, marketing, permitting, socio-economic or other relevant issues that may materially affect the Mineral Resources described in this Technical Report. It is emphasized that SRK‟s findings are based on reviews of readily available data sources only. Future changes to legislation (mining, taxation, environmental, human resources and related issues) and/or government or local attitudes to foreign investment cannot be, and have not been evaluated within the scope of this Technical Report.

The North Shore property comprises of a number of zones uranium mineralization, including TJ, Middle, and Double S zones. Uranium mineralization occurs mostly in pegmatite and granitic gneiss hosted in a paragneiss sequence. The Mineral Resource model presented herein represents the second resource evaluation for the Double S uranium deposit. An initial Mineral Resource evaluation, based on 61 holes drilled in 2007, was completed in August, 2008 by Ron Parent, P.Geo., of ResourceEye Geological Services Inc. The Mineral Resource evaluation reported herein incorporates sampling information from an additional 33 infill and exploratory drill holes completed by Uracan in 2009.

The Mineral Resources are reported in accordance with National Instrument 43-101 and have been estimated in conformity with generally accepted CIM “Estimation and Mineral Resource and Mineral Reserve Best Practices” guidelines. Mineral Resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into mineral reserves. The Mineral Resource evaluation was originally prepared for the previous technical report dated June 24, 2010 by Abolfazl Ghayemghamian, P.Geo., with the assistance of Marek Nowak, P.Eng. (APEGBC#119958), who are both appropriate independent Qualified Persons, as this term is defined in National Instrument 43-101. Mr Ghayemghamian has since left SRK and is not responsible for the current resource disclosure. For the mineral resource statement reported herein, only the classification was updated to account for the new metallurgical data. The mineral resources were therefore reclassified and verified by Marek Nowak, P.Eng. Mr Nowak is the Qualified Person solely responsible for the Mineral Resource evaluation presented in this technical report. Jean-François Couture, P.Geo. (OGQ#1106, APGO#0197), who is a Qualified Person registered in the Province of Quebec, completed the site visit on February 25, 2010 and has supervised and reviewed this technical report.

The database used to estimate the Mineral Resources was audited by SRK. Uranium mineralization boundaries were modelled by SRK using a geological interpretation prepared by Uracan. SRK is of the opinion that the current drilling information is sufficiently reliable to interpret with confidence the boundaries of the mineralized areas and that the assaying data are sufficiently reliable to support estimating Mineral Resources.

This section describes the work undertaken by SRK and key assumptions and parameters used to prepare the initial Mineral Resource model for the Double S uranium deposit, together with appropriate commentary regarding the merits and possible limitations of such assumptions.

16.2 Resource Database

The database used to estimate resources in the Double S zone was compiled by Uracan. It comprises descriptive and assay information from exploration drilling conducted by Uracan in 2007 and 2009. The database was provided to SRK in an Access format and contains a total of 18,253 records from 94 diamond drill holes (Table 16.1). All of the drilling and surveying data were collected using the local UTM grid (NAD83 Zone 20).

Table 16.1: Double S Deposit Exploration Database

Year	Operator	Type	Number	Length (m)	Number of Samples
2007	Uracan	DDH	61	14,841	11,843
2009	Uracan	DDH	33	8,889	6,410
Total			**94**	**23,730**	**18,253**

The database also includes 298 specific gravity measurements acquired by Uracan on core samples using a water displacement methodology. The specific gravity data were subdivided on the basis of uranium content and analysed statistically. The median value for waste and uraniferous zones was used to convert volumes into tonnages (Table 16.2). Although, the number of measurements for the waste areas is quite small, SRK considers that a median value of 2.66 is adequate.

Table 16.2: Bulk Density of Mineralized and Waste Zones

Zone	Number of Specific Gravity Determinations	Total Samples	Bulk Specific Gravity
Mineralized zone	272	14,065	2.63
Waste	26	4,188	2.66

16.3 Solid Modelling

The uranium mineralization on the North Shore property generally occurs as fine dissemination and splashes along fractures of uraninite and pitchblende, both in pegmatite dikes and granitic rock intruded in a paragneiss sequence. The uranium is generally of low tenor and associated with intense fracturing, brick red hematite staining of feldspar, greenish smoky quartz, biotite and magnetite. The enclosing paragneiss are barren. Previous writers have noted the patchy nature of the uranium mineralization that form lens-like bodies sub-parallel with the foliation of the hosting paragneiss. The scale of these lenses ranges from a few m to at least 350 by 80 m.

The Double S zone comprises two distinct sub-vertically dipping bodies defined by surface outcrop and drilling. Area 1 forms a broad zone with an overall north-northwest elongation, and Area 2 occurs to the southeast (Figure 16.1). Area 2 is defined by fewer boreholes and appears as a separate northeast-trending body. There is insufficient sampling data to support evaluating Mineral Resources for Area 2.

The zones of uranium mineralization encompass enclaves or xenoliths of barren gneiss partly digested by the granitic melt. Where observed, these xenoliths dip from 40 to 60 degrees towards the east-southeast, imparting an apparent dip to the uranium mineralization. The geometry of the uranium mineralization remains, however, elusive.

Figure 16.1: Plan View Showing the Distribution of the Uranium Mineralization in Area 1 and Area 2

Geological modelling was completed by SRK using Datamine Studio 2. SRK constructed solid wireframes representing the mineralized envelope and barren xenoliths using the drilling data and sectional interpretations provided by Uracan. The provided interpretations included GEMS wireframes of barren gneiss, grouped into three main units: M1-4, M6 and M12 (Table 16.3 and Figure 16.2). Wireframe surfaces of the topography and top of bedrock were also created.

The lithological units I1B and I1G carry the mineralization. The uranium mineralized envelope encompasses the area limited to within 50 to 100 m around drill hole data (Figures 16.1 and 16.2).

The true boundary extents of the mineralization are not yet determined. The zones‟ definitions are shown in Table 16.3 and statistics of the U3O8 assays in both Area 1 and Area 2 are presented in Figure 16.3.

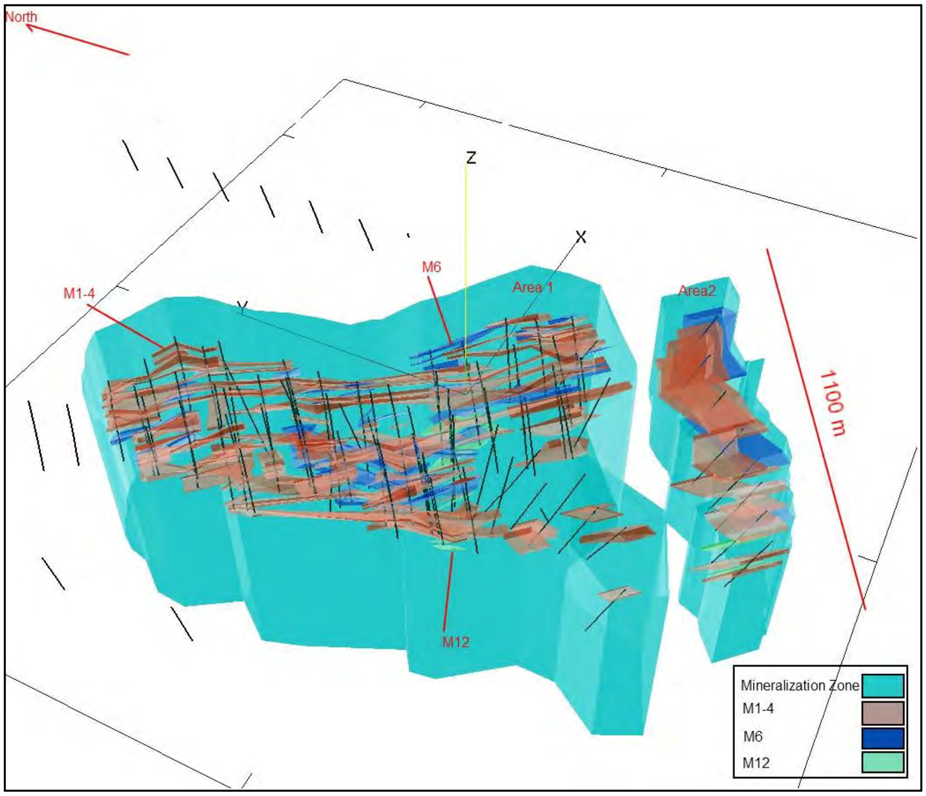
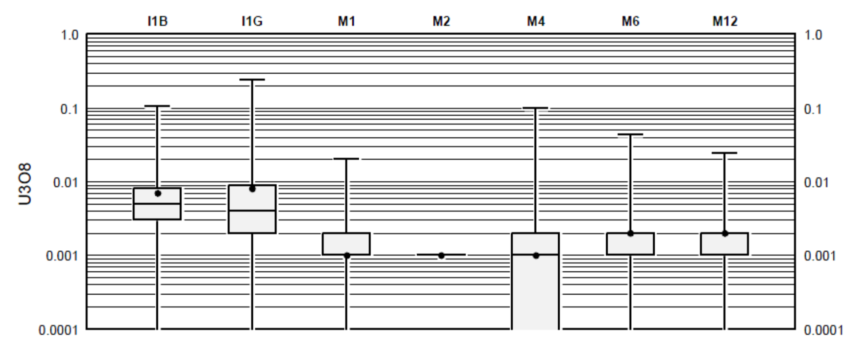


Figure 16.2: Isometric View Looking Down Towards the Northeast of the Mineralized Envelopes for Area 1 and Area 2, with the Enclosed Solids Representing Barren Xenoliths

Table 16.3: Rock Type Definition in Double S Deposit

Rock Type	Definition
I1B	Granite
I1G	Pegmatite
M1	Felsic gneiss
M2	Layered gneiss
M4	Paragneiss
M6	Granite gneiss
M12	Interbeded felsic Gneiss



	I1B	I1G	M1	M2	M4	M6	M12	
Number of data	5892	6294	438	5	2651	1098	313	Number of data
Mean	0.007	0.008	0.001	0.001	0.001	0.002	0.002	Mean
Maximum	0.106	0.243	0.02	0.001	0.099	0.043	0.024	Maximum
Upper quartile	0.008	0.009	0.002	0.001	0.002	0.002	0.002	Upper quartile
Median	0.005	0.004	0.001	0.001	0.001	0.001	0.001	Median
Lower quartile	0.003	0.002	0.001	0.001	0.0	0.001	0.001	Lower quartile
Minimum	0.0	0.0	0.0	0.001	0.0	0.0	0.0	Minimum
Variance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Variance
Std. Dev.	0.007	0.01	0.002	0.0	0.003	0.003	0.003	Std. Dev.
CV	1.04	1.271	1.078	0.269	2.075	1.298	1.462	CV

Figure 16.3: U_3O_8 Statistics in Different Rock Types within the Mineralization Envelope

16.4 Evaluation of Extreme Assay Values

Block grade estimates may be unduly affected by high grade outliers. Therefore assay data were evaluated for high grades outliers and capped to values that, on probability plots, appear as the lower boundary of a small but very high grade population. Analysis of probability plots suggests capping the uranium assays at 0.1% is appropriate. Capping affects only 5 samples and its impact on the mean grade is negligible (Table 16.4).

Table 16.4: Capping Levels Applied Raw Assays

Zone	Maximum Value (%)	Cap Value (%)	Mean U_3O_8 grade (%)		Number Capped	Lost Metal* (%)
			Aver	AverCap		
Resource Domain	0.243	0.1	0.0069	0.0069	5	0.3

*Lost metal is (Aver - AverCap)/Aver*100 where Aver is the average grade of the assays before capping and Aver Cap is the average grade of the assays after capping.

16.5 Compositing

The vast majority of the assay samples inside the resource domains were collected at 1.5 m intervals (Figure 16.4). Considering the potential for large tonnage bulk mining of the deposit it was felt that the resource estimation should be derived from composited assays with higher lengths. Therefore, the capped assays were composited to 3 m lengths.

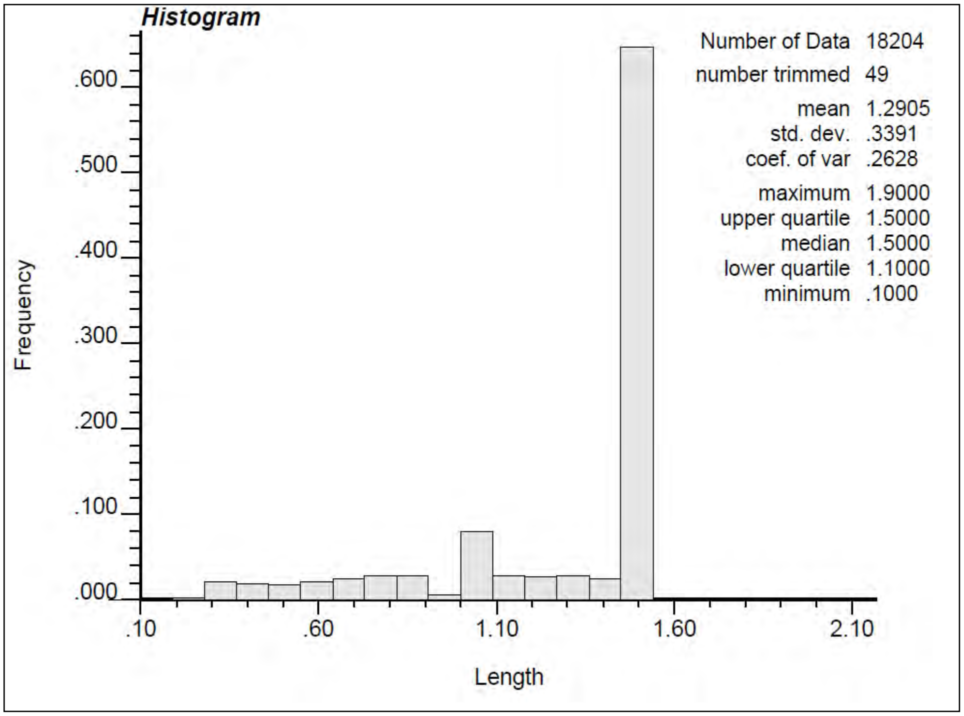


Figure 16.4: Histogram of Sample Lengths in the Double S Zone

16.6 Variography

An experimental variogram and variogram model were generated from composites of Area 1 resource domain. The nugget effect, representing 25% of the total sill, was established from down-hole variograms. The variogram model used for grade estimation within the mineralized envelope of Area 1 is summarized in Table 16.5.

Table 16.5: Exponential Variogram Models

Zone	Nugget C0	Sill C1	Datamine Rotations (LLL rule)			Ranges a1, a2		
			around Z	around Y	around Z	X-Rot	Y-Rot	Z-Rot
Area 1	0.25	0.30	-15	-25	0	50	60	20
		0.45	-15	-25	0	180	260	140

16.7 Block Modelling

A block model was constructed to cover the entire extent of the uranium mineralization and any potential pit limits. It was clipped to bottom of overburden surface created from the borehole data. The geometrical parameters of the block model are summarized in Table 16.7. A Datamine sub-block routine was used to fill the domain wireframes. Parent blocks are 10 by 20 by 5 m in size. Each sub-block was estimated individually.

Table 16.6: Resource Block Model Extent

Description	Easting (X)	Northing (Y)	Elevation (Z)
Block Model Origin (NAD 83 Zone 20)	507,800	5,575,700	-600
Parent Block Dimension (m)	10	20	5
Number of Blocks	230	150	160
Minimum Sub- Block Dimension (m)	1.25	2.5	0.005
Rotation (degree)	0	0	0

In addition to the various uranium oxide grade estimates, the block model includes distance to nearest sample, resource category, rock code, number of samples used for the estimation, pass identification number, kriging variance, bulk specific gravity and area code.

16.8 Grade Interpolation

The block U_3O_8 grades were estimated using two estimators (ordinary kriging and inverse distance). However, the ordinary kriging estimate was used for reporting Mineral Resources. Estimation was completed in three successive passes. The 1st pass considered a relatively small search ellipsoid while for the 2nd and 3rd pas the search ellipsoid dimensions were increased as indicated in Table 16.7. Successive interpolation passes estimated only the blocks not estimated in the preceding pass.

Table 16.7: Resource Estimation Parameters

Resource	Estimator	Search	Search	Rotation		Search Ellipse Size			Number of Composites		Max Samples in DDH
Domain		Pass	Type	Z	Y	X (m)	Y (m)	Z (m)	Min.	Max.	Key
Mineralized Zone	OK	1	Ellipse	-15	-25	90	130	70	4	16	3
	OK	2	Ellipse	-15	-25	180	260	140	4	16	3
	OK	3	Ellipse	-15	-25	270	390	210	3	16	3

16.9 Indicator Model for Resource Classification

To assist in resource classification, inverse distance squared block estimates were run on composite indicators at 0.01% U_3O_8 threshold. The procedure was similar to indicator kriging. Before the estimation, each composite was converted to an indicator value “1” if it was above the threshold or an indicator value “0” if it was below the threshold. The resulting estimates were used to infer a higher probability that a given block may become part of the economic resource. In almost all cases, only the blocks estimated from the first pass were taken into account. The classification proceeded in two stages. In the first stage, the blocks with an indicator probability higher than 50% were flagged as falling within a region that could be classified as Indicated. In the second stage, wireframe envelopes were designed to encompass areas with large clusters of the flagged blocks. Only blocks within the envelopes were classified as Indicated.

16.10 Mineral Resource Classification

Mineral Resources were estimated in conformity with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserve Best Practices" Guidelines. Mineral Resources are not mineral reserves and do not have demonstrated economic viability. The Mineral Resources may be affected by subsequent assessment of mining, environmental, processing, permitting, taxation, socio-economic and other factors. There is insufficient information in this early stage of study to assess the extent to which the Mineral Resources will be affected by these factors that are more suitably assessed in a conceptual study.

Mineral reserves can only be estimated based on the results of an economic evaluation as part of a preliminary feasibility study or feasibility study. As such, no mineral reserves have been estimated by SRK as part of the present assignment. There is no certainty that all or any part of the Mineral Resources will be converted into a Mineral Reserve.

The Mineral Resources for the Double S Deposit have been classified according to the "CIM Definition Standards for Mineral Resources and mineral reserves" (December, 2005) by Marek Nowak, P.Eng. (APEGBC#119958), an independent Qualified Persons as this term is defined in National Instrument 43-101.

The Double S uranium mineralization was investigated by drilling at a spacing varying between 80 to 120 m to a depth of approximately 250 m. SRK considers that the quantity and quality of the exploration data (confidence in the location and reliability of assaying results) acquired by Uracan are good and therefore is not a factor that would impact resource classification.

There is insufficient information to confirm both the geological and grade continuity with the current level of sampling and support a Measured Mineral Resource classification within the meaning of CIM Definition Standards.

The confidence in the geological and grade continuity is sufficient to support an Indicated classification for some portions of the Double S Deposit. An Indicated classification was assigned to blocks estimated during (i) the first interpolation pass as described in Table 16.7 and (ii) a having more than 50% chance of being above the cut-off grade as defined by an inverse distance model on indicators with a grade threshold of 0.01% U_3O_8. All other estimated blocks were classified into the Inferred category.

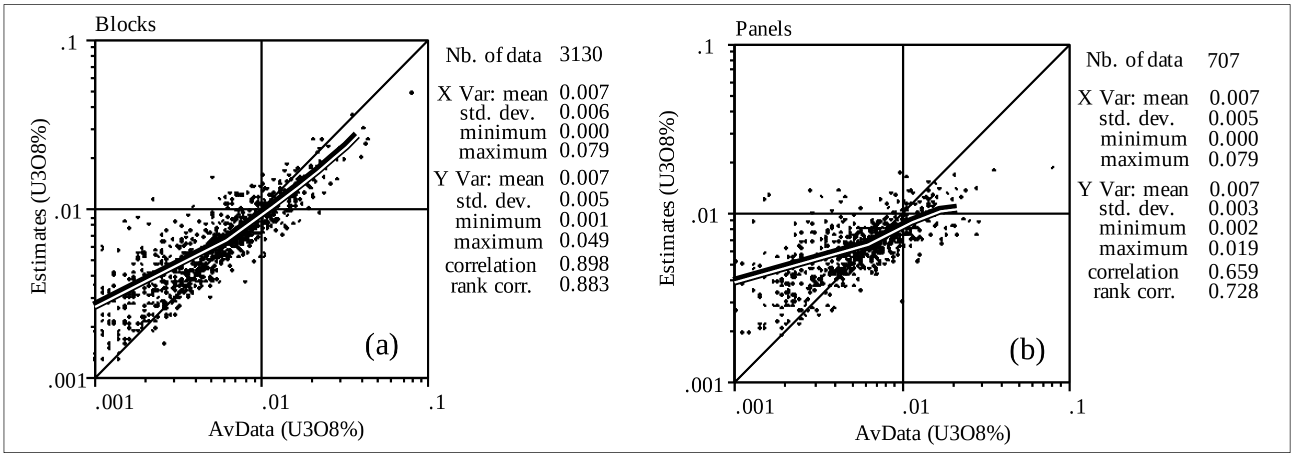
16.11 Validation of the Block Model

The block model was validated by completing a series of visual inspections and by:

- Comparison of local "well-informed" block grades with composites contained within those blocks and, and comparison of panel grades with composites contained within those panels; and
- Comparison of average assay grades with average block estimates along different directions – swath plots.

Figure 16.5 shows a comparison of estimated U_3O_8 block grades with borehole assay composite data contained within those blocks in the Area 1 resource domain. On average, the estimated blocks are identical to the composite data, with high correlation (0.90) between the estimates and the composites.

Figure 16.6 also shows a comparison of estimated and bore hole composite grades within large 80 by 160 by 20 m panels. Again, the averages of those two types of data are identical, although there is a larger scatter of points around the x = y line. This scatter is typical of smoothed block estimates compared to the more variable assay data used to estimate those blocks. The thick white line represents a piece-wise linear regression through the data.



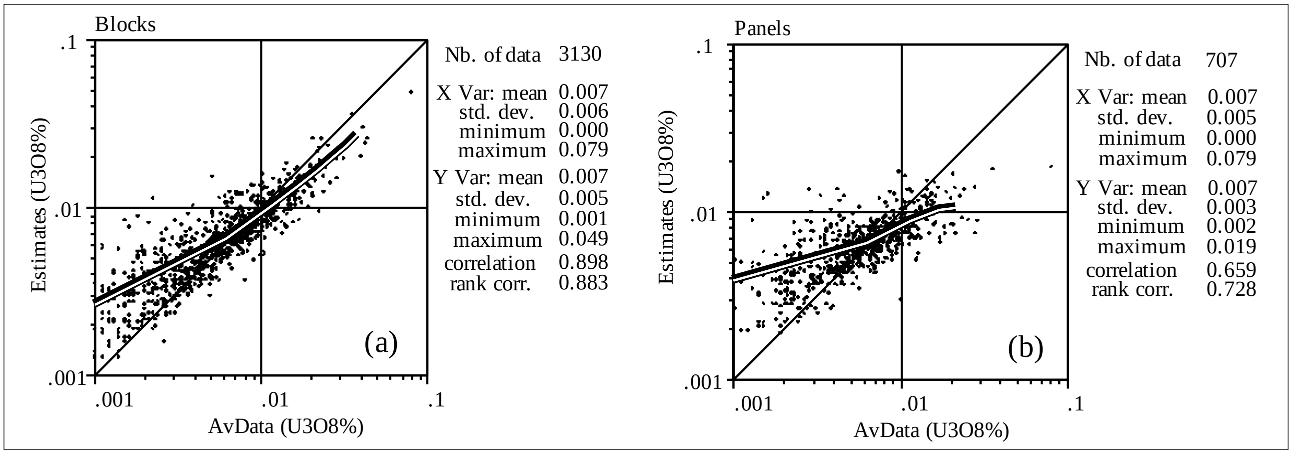


Figure 16.5: Comparison of Block (left) and Panel (right) Estimates with Borehole Assay Data Contained Within the Blocks and Panels of Area 1

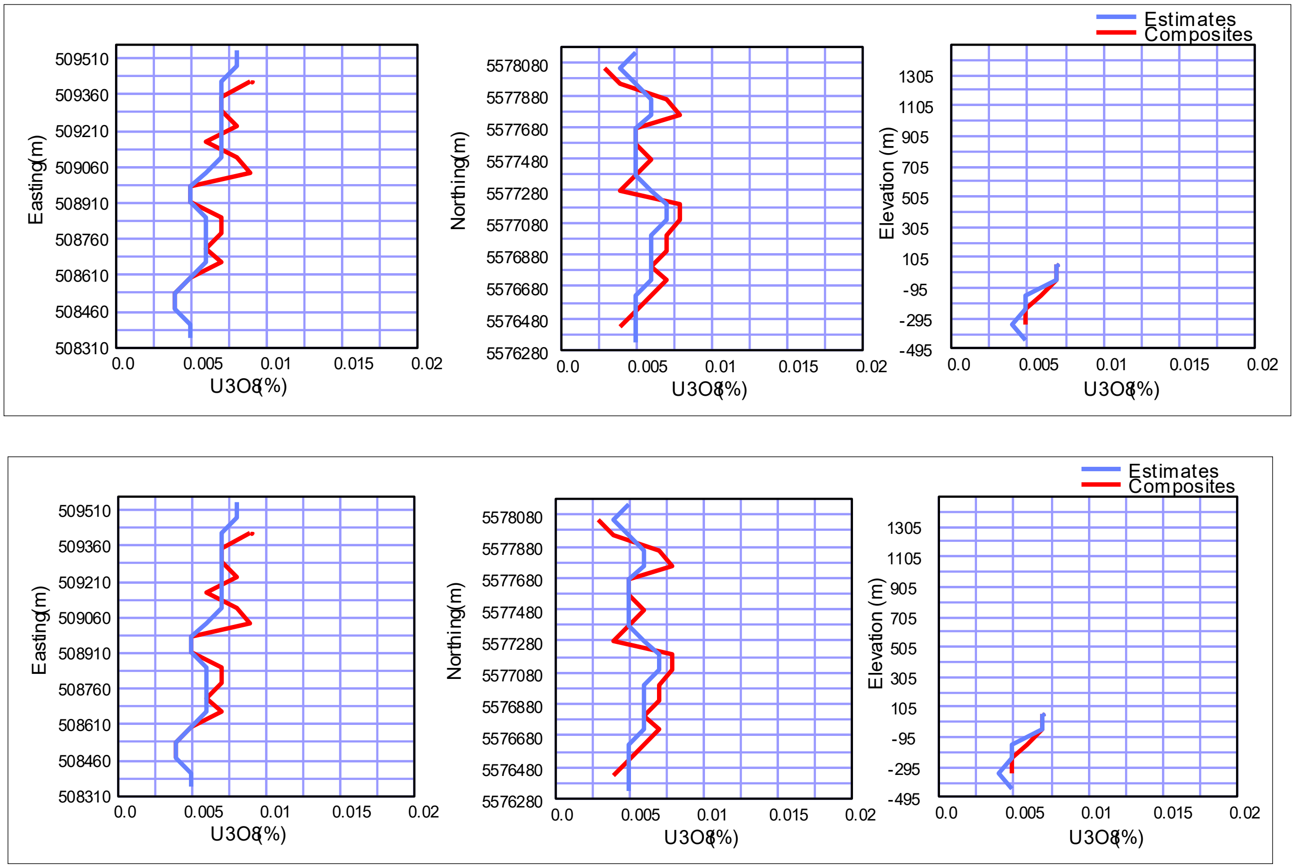


Figure 16.6: Declustered Composites Compared to Block Estimates in Area 1

16.12 Mineral Resource Statement

CIM Definition Standards for Mineral Resources and mineral reserves (December 2005) defines a Mineral Resource as:

> "*a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge*".

The "reasonable prospects for economic extraction" requirement generally implies that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade taking into account extraction scenarios and processing recoveries. SRK considers that the uranium mineralization evaluated in the Double S Deposit is amenable for open pit extraction.

In order to determine the quantities of material offering reasonable prospects for economic extraction from an open pit, SRK used a Whittle pit optimizer to evaluate the profitability of each resource block based on certain optimization parameters selected from comparable projects. The optimization parameters include: mining and processing costs of CN$14.50 per processed tonne, overall pit slope angles of 45 degrees, metallurgical recovery of 90%, and appropriate dilution and offsite costs and royalties. A uranium price of US$75 per pound of uranium oxide was considered. The reader is cautioned that the results from the conceptual pit optimization work are used solely for the purpose of reporting Mineral Resources that have “reasonable prospects” for economic extraction by an open pit and do not represent an attempt to estimate mineral reserves.

SRK compared the mineralogy and geology of the Double S Deposit with several similar deposits. Considering the nature of the uranium mineralization and the results of the conceptual pit optimizations work, SRK considers that it is appropriate to report the Mineral Resources at a cut-off grade of 0.01% U_3O_8. This cut-off is in line with 0.009% U_3O_8 cut-off used to report the Mineral Resources for the Middle and TJ zones of the North Shore property. Similar cut-off grades are also used at the Rössing Mine (0.008% U_3O_8) and at Valencia deposit (0.007% U_3O_8), both in Namibia. The Mineral Resource Statement for the Double S uranium deposit is presented in Table 16.8.

Table 16.8: Mineral Resource Statement*, Double S Zone, North Shore property, Quebec, SRK Consulting (Canada) Inc, July 4, 2011

Classification	Tonnage (tonnes)	Grade U3O8 (%)	Contained metal U_3O_8 (lb)
Indicated	21,504,000	0.014	6,858,000
Inferred	59,960,000	0.012	16,328,000

* Reported at a cut-off grade of 0.01 percent within a Whittle pit shell optimized using a U_3O_8 price of US$75 per pound of U_3O_8, metallurgical recovery of ninety percent, and overall mining and processing costs of CN$14.50. All numbers are rounded to reflect relative accuracy of the estimates.

The Double S Mineral Resources are highly sensitive to the selection of cut-off grade. Table 16.9 shows global quantities and grade estimates at different cut-off grades. The reader is cautioned that these figures should not be misconstrued as a Mineral Resource. The reported quantities and grades are only presented as a sensitivity of the resource model to the selection of the cut-off grades.
A grade-tonnage curve is presented in Figure 16.7.

Table 16.9: Block Model Quantity and Grades Estimates* at Various Cut-off Grades within the Whittle shell

Cut-Off U_3O_8 (%)	Quantity (1000xtonnes)	Grade U_3O_8 (%)	Contained Metal U_3O_8 (1000xlb)
0.045	0.261	0.049	0.282
0.040	20	0.043	19
0.035	75	0.038	64
0.030	222	0.034	168
0.025	728	0.029	468
0.020	3,086	0.024	1,603
0.015	14,273	0.018	5,746
0.010	**81,464**	**0.013**	**23,185**
0.005	530,023	0.008	89,886

* The reader is cautioned that the figures presented in this table should not be misconstrued as a Mineral Resource statement. The reported quantities and grades are only presented to show the sensitivity of the resource model to the selection of cut-off grade.

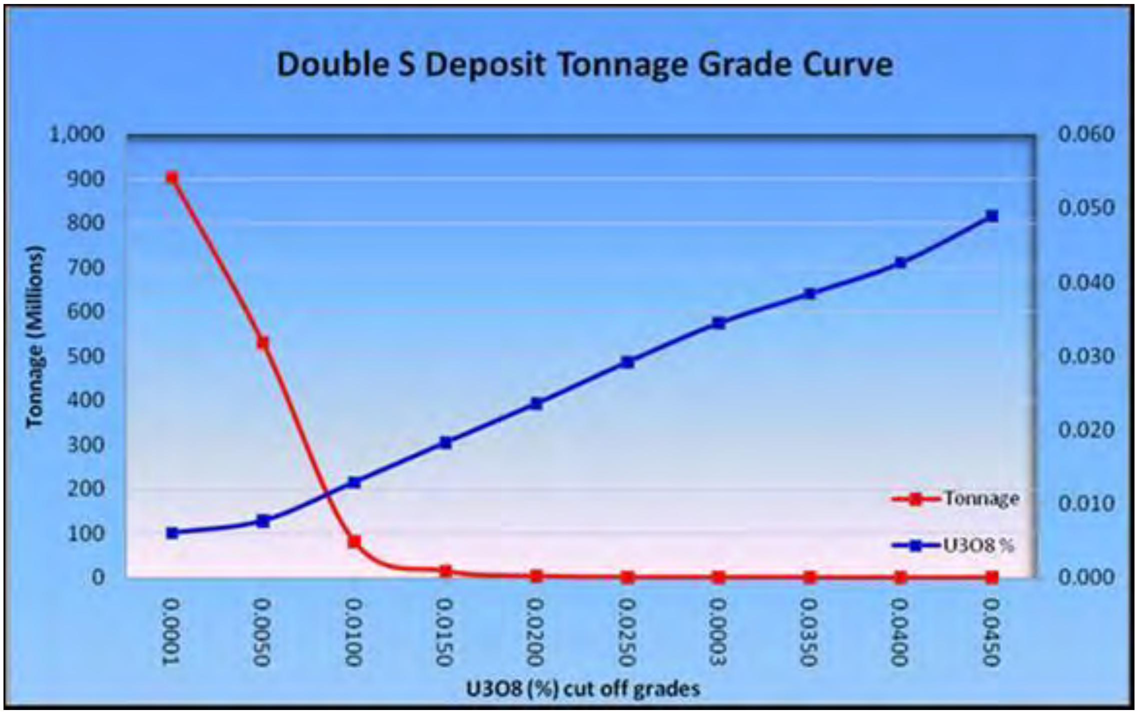


Figure 16.7: Grade Tonnage Curve for the Double S Deposit, North Shore Property, Quebec

17 Other Relevant Data and Information

There are no other relevant data related to this report.

18 Interpretation and Conclusions

SRK reviewed and audited the exploration data available for the Double S zone. This review suggests that the exploration data accumulated by Uracan is reliable for the purpose of resource estimation.

SRK reviewed geological interpretation provided by Uracan personnel and on that basis constructed solid wireframes of barren xenoliths and a mineralized envelope. Geological modelling was completed with Datamine Studio 2.

Following geostatistical and variographic analyses, SRK constructed a resource block model for the Double S zone. After validation and classification, and based on the results of the conceptual pit optimizations work, SRK considers that it appropriate to report the Mineral Resources at a cut-off grade of 0.01% U_3O_8. This cut-off is in line with 0.009% U_3O_8 cut-off used to report the Mineral Resources for the Middle and TJ zones of the North Shore property. Similar cut-off grades are also used at the Rössing Mine (0.008% U_3O_8) and at Valencia deposit (0.007% U_3O_8), both in Namibia.

Mineral Resources for the Double S zone have been estimated in conformity with generally accepted CIM "Estimation of Mineral Resource and Mineral Reserves Best Practices" Guidelines. In the opinion of SRK, the block model resource estimate and resource classification reported herein are a reasonable representation of the uranium Mineral Resources. Mineral Resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into mineral reserve.

A number of factors may affect the quality and quantity of the current estimates, and thereby highlight opportunities for improvement:

- There is some uncertainty on the geometry of the modelled barren xenoliths. Additional drill hole information would definitely assist in better definition of the barren zones.
- Thorough QA/QC procedures with higher number of blanks and standards inserted into the sample stream would ensure greater confidence in the assay data.

19 Recommendations

The following recommendations provide a framework for future drilling and improved geology and resource models:

- The lateral and down dip extensions of uranium zones in both Area 1 and Area 2 are not well established. More drilling is required to define the full extent of the uranium mineralization. In particular, the area between Area 1 and Area 2 and in the northeast extension of Area 1 should be investigated by drilling;
- Infill drilling in Area 2 is required to improve the confidence in the geological interpretation and to define the shape of that uranium mineralization domain. This additional drilling will also help in demonstrating grade continuity with variography to support resource estimation;
- Out of 197 sample batches, 161 have no standards within the batch. This means the number of standards utilized by Uracan is well below what is recommended by industry best practises. Future drilling and assaying should include one standard and one blank for every 20 samples;
- SRK recommends using control samples at two grade thresholds, one near the average grade of the deposit (0.007%) and one at a grade of around 0.013%;
- Specific gravity measurements should be routinely measured on core samples from all rock types to augment the existing data and confirm variability of specific gravity between barren and uranium-bearing rocks;
- The topographic surface used to constrain the resource model was created from borehole collar data. This is not suitable to map the local variation of topography around the deposits and for supporting meaningful engineering studies. SRK recommends that a more accurate digital terrain model is obtained for Double S project area and the surrounding areas where potential mine infrastructure could be located; and
- SRK suggest additional metallurgical testwork be conducted on a range of North Shore samples to define the impact of crush size and leaching conditions on uranium extraction levels. Testwork should include mineralogical and liberation analysis, leach kinetic studies on different crushed feed sizes as well as possible agglomeration requirements.

20 References

Bohm, C. (2007). Geological Mapping of parts of the Middle and South Zone; unpublished company report, *Uracan Resources Ltd*., 13 pages.

Brodie, S. (2008). The Double S Zone Deposit on the North Shore of The St. Lawrence Seaway in Eastern Quebec, Canada: Mineralogic, Petrogenetic, and Geochronologic Constraints; unpublished B. Sc. Thesis, University of New Brunswick, 147 pages.

Brown J, (2011). An Investigation into Uranium Recovery from the North Shore Property, prepared for Uracan Resources

Canadian Institute of Mining, Metallurgy and Petroleum (2005). CIM Definition Standards for Mineral Resources and Mineral Reserves; CIM Definition Standards; URL http://www.cim.org/committees/cimdefstds_dec11_05.pdf, 11 pages.

Canadian Institute of Mining, Metallurgy and Petroleum (2005). CIM Best Practices for Mineral Exploration; CIM Exploration Best Practices Guidelines; URL http://www.cim.org/definitions/explorationBESTPRACTICE.pdf, 3 pages.

Cloutier, M. (2009). Internal Report: North Shore Property Bloc Turgeon A Mapping 2009, interpretation and summary of work, *Uracan Resources Ltd.,* 29 pages.

Jutras, M. (2009). Amended Technical Report on the North Shore Property Middle and TJ Zones, Quebec, Canada, Mineral Resource Estimation, NI 43-101 Technical Report, 144 pages

Lafleur, J. (2006). UFM Ventures Ltd. North Shore Property NI 43-101 Technical Report, 180 pages.

McMillan, R.H. (1998). Unconformity-associated U, in Geological Fieldwork 1997, British Columbia Ministry of Employment and Investment, Paper 1998-1, pages 24G-1 to 24G-4.

Nichol, R. N. (2009). Internal Report: Summer 2008 Geological Work: North Shore Turgeon and Costebelle Claims Groups; unpublished company report, *Uracan Resources Ltd.,* 80 pages.

Parent, R. (2008). Updated Technical Report on the North Shore Property, including Mineral Resource Calculation, NI 43-101 Technical Report, 102 pages.

Renou, A.S. (2008). Petrographic Study on the “North Shore” uranium property; unpublished company report, *Uracan Resources Ltd*., 126 pages.

Smith, P. (2005). The Lac Turgeon Granite Uranium Exploration Plays, 1967 to Present, Baie Johann Beetz, Quebec, Internal Document, 15 pages.

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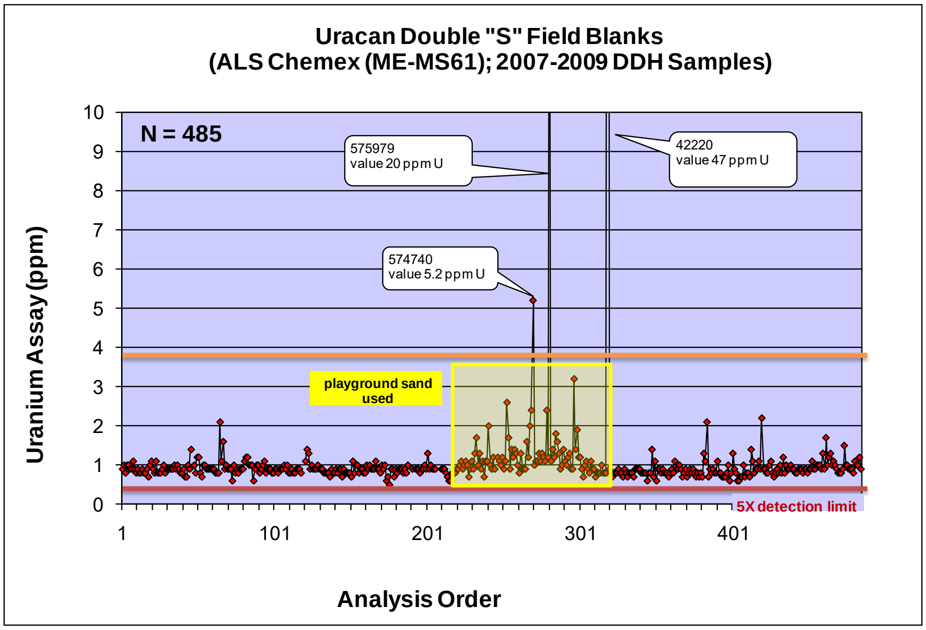
All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

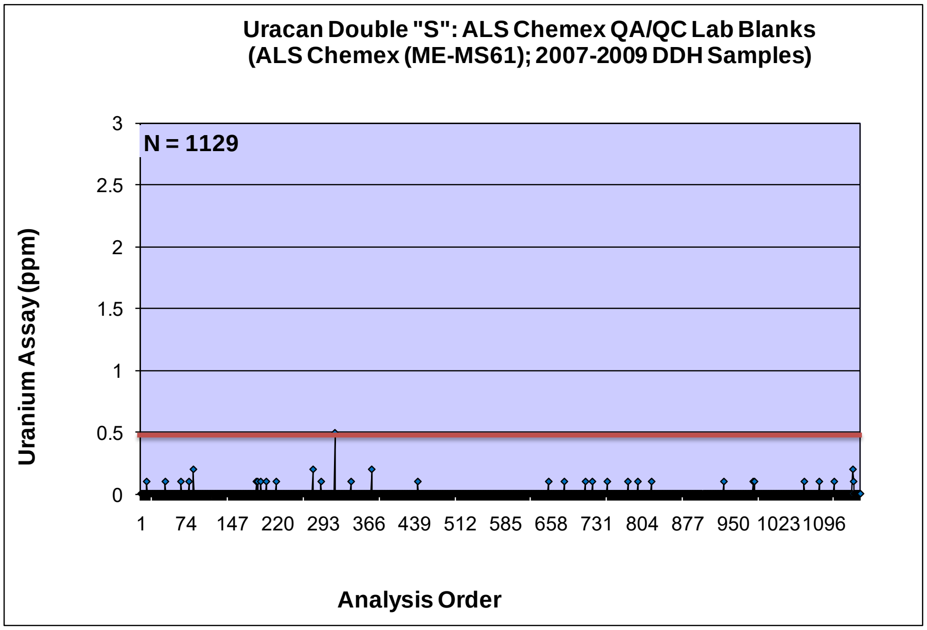
Appendix A

Charts of Analytical Quality Control Data

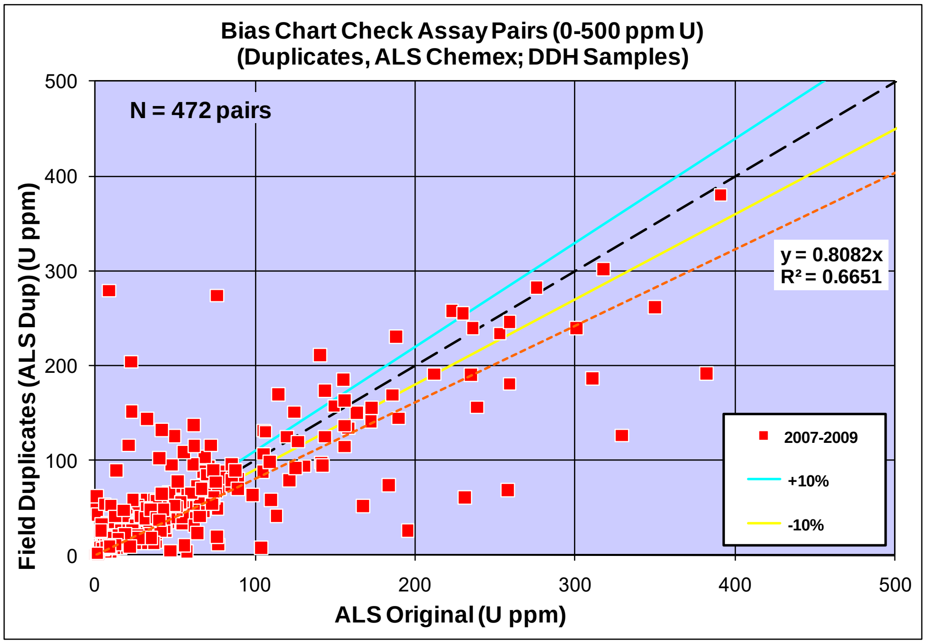
Assay results for Uracan blank samples inserted with samples submitted for assaying:



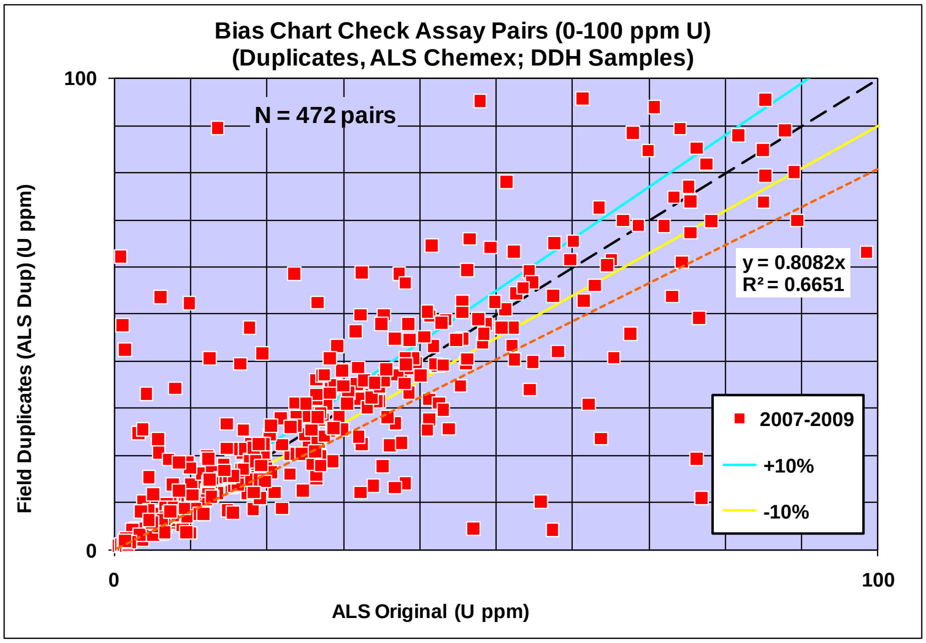
Assay results for Chemex blank samples inserted with samples submitted for assaying:



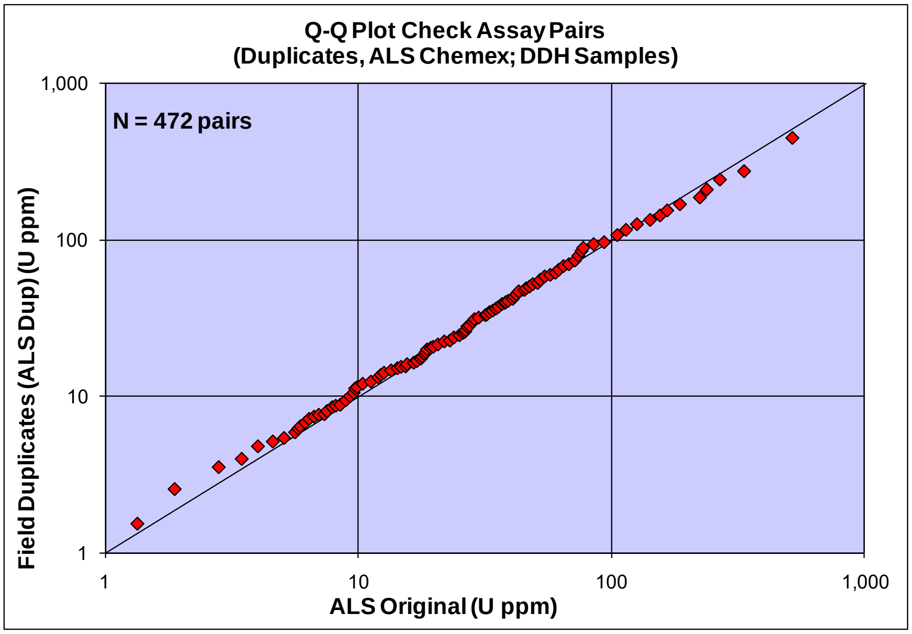
Scatterplot of field original and duplicate pairs of assays; 0 to 500ppm Uranium:



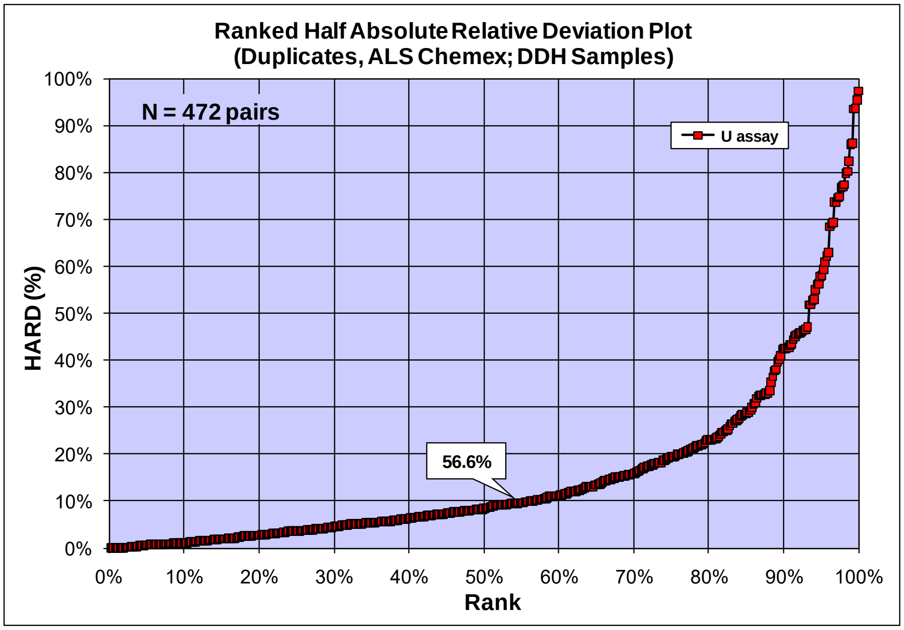
Scatterplot of field original and duplicate pairs of assays; 0 to 100ppm Uranium:



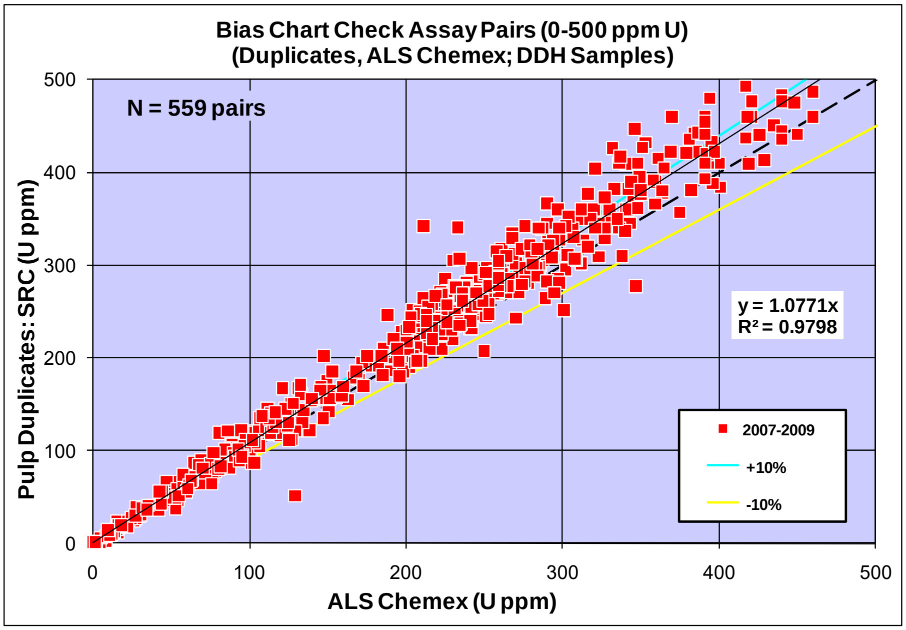
Q-Q plot of duplicate-original pairs of assays:



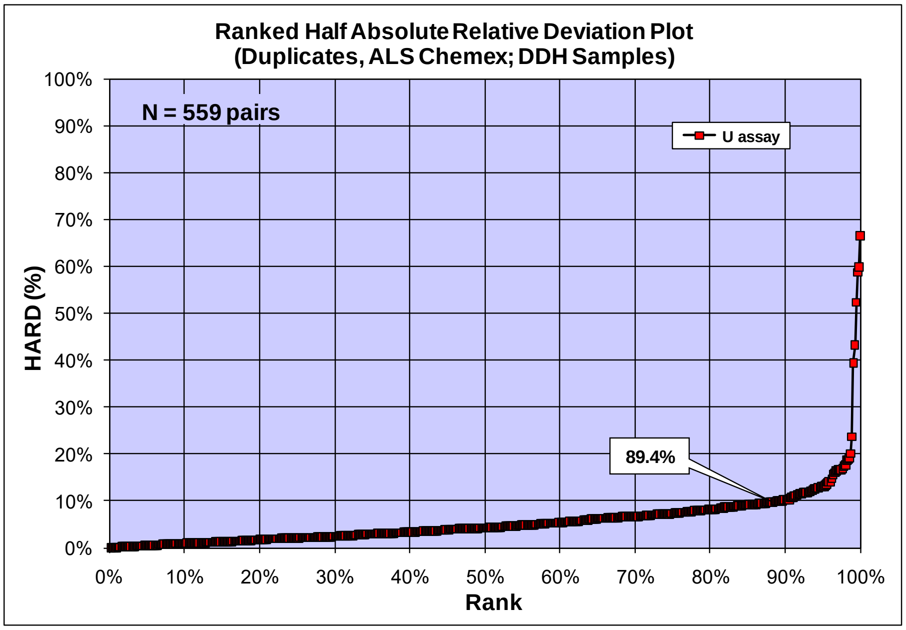
Percentile rank of half absolute % relative Difference between ¼ core duplicate and original assays ("HARD")



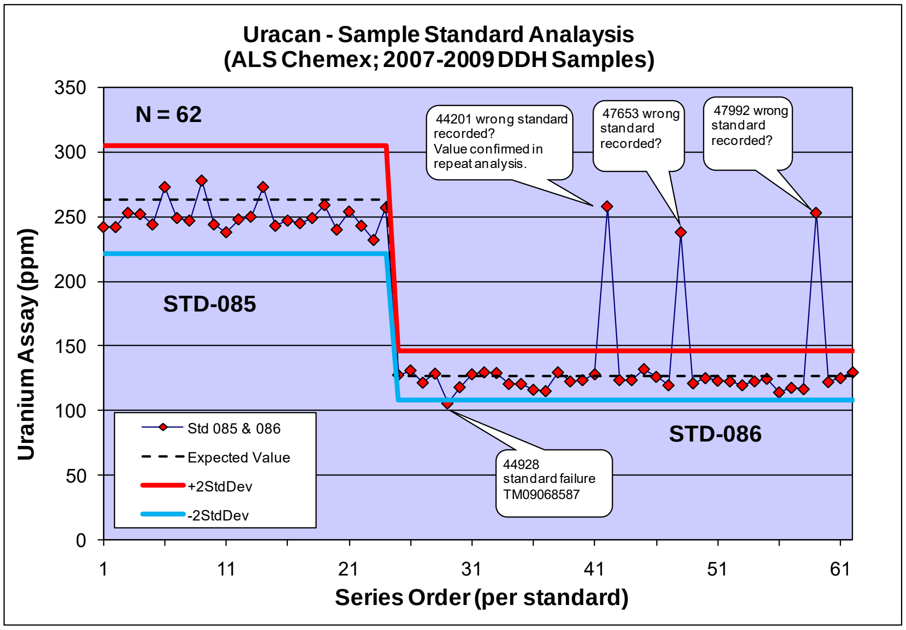
Scatterplot of pulp original and duplicate pairs; 0-500ppm Uranium:



Percentile rank of half absolute % relative Difference between pulp duplicate and original assays ("HARD"):

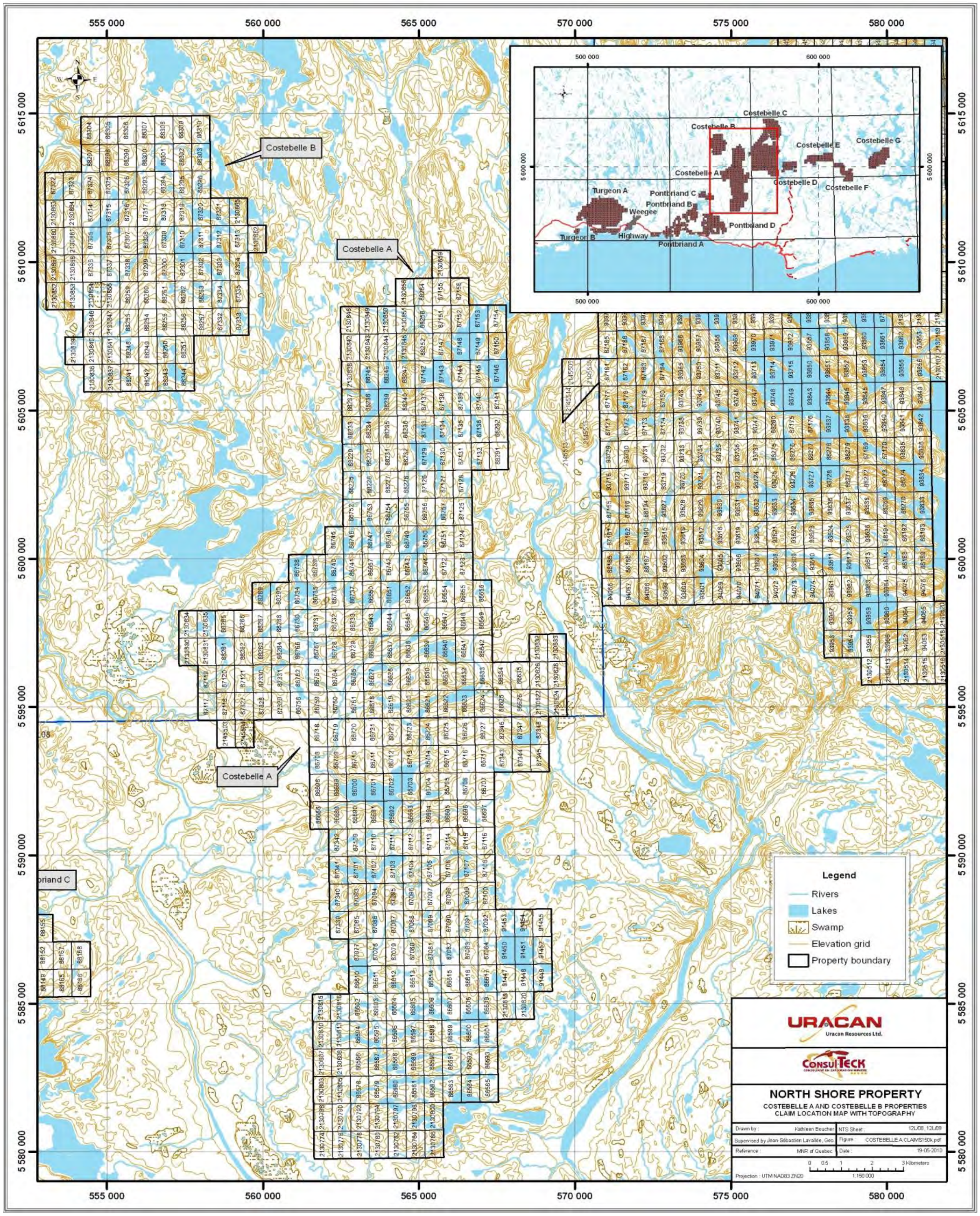


Assay results for field control samples STD-085 and STD-086:

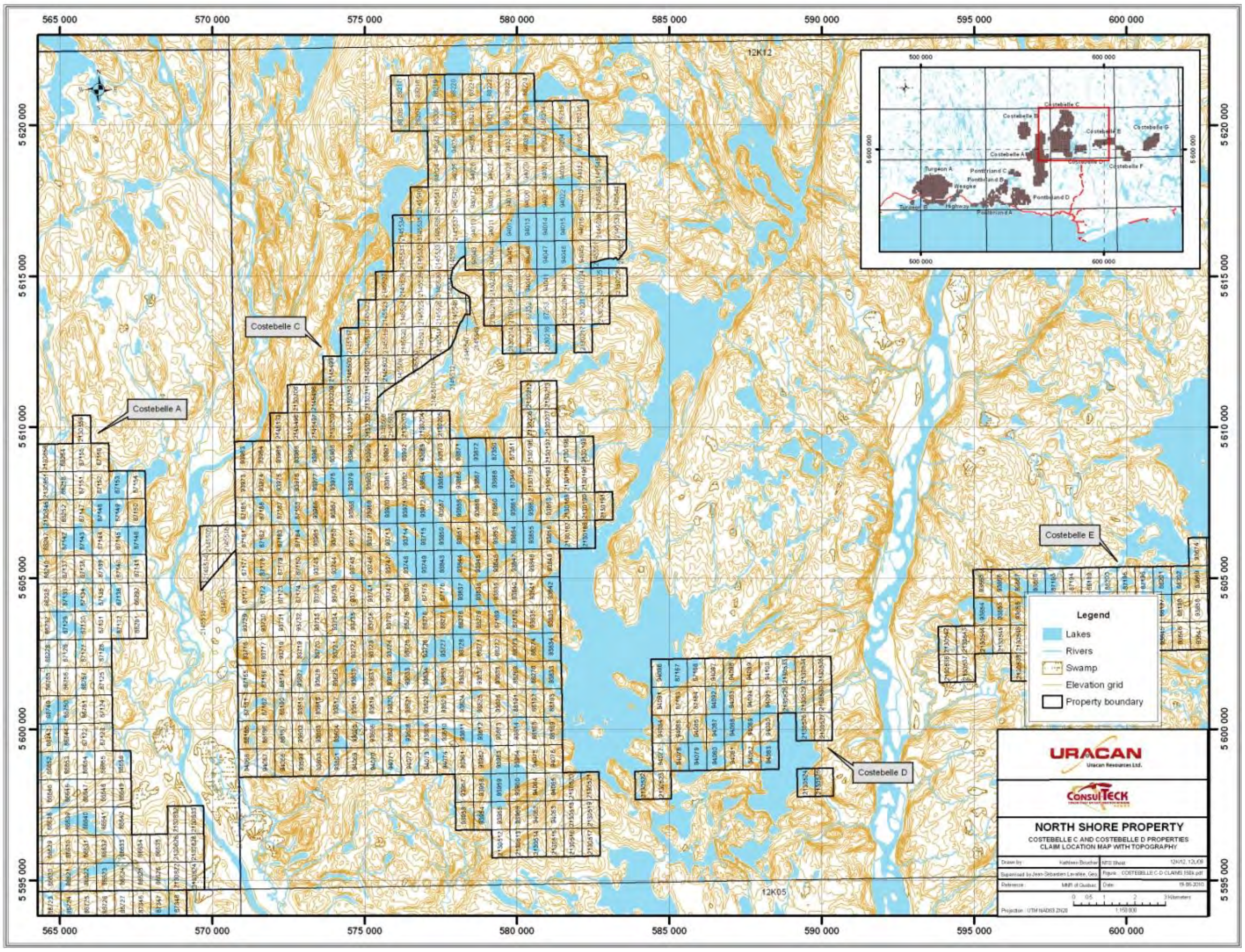


Appendix B

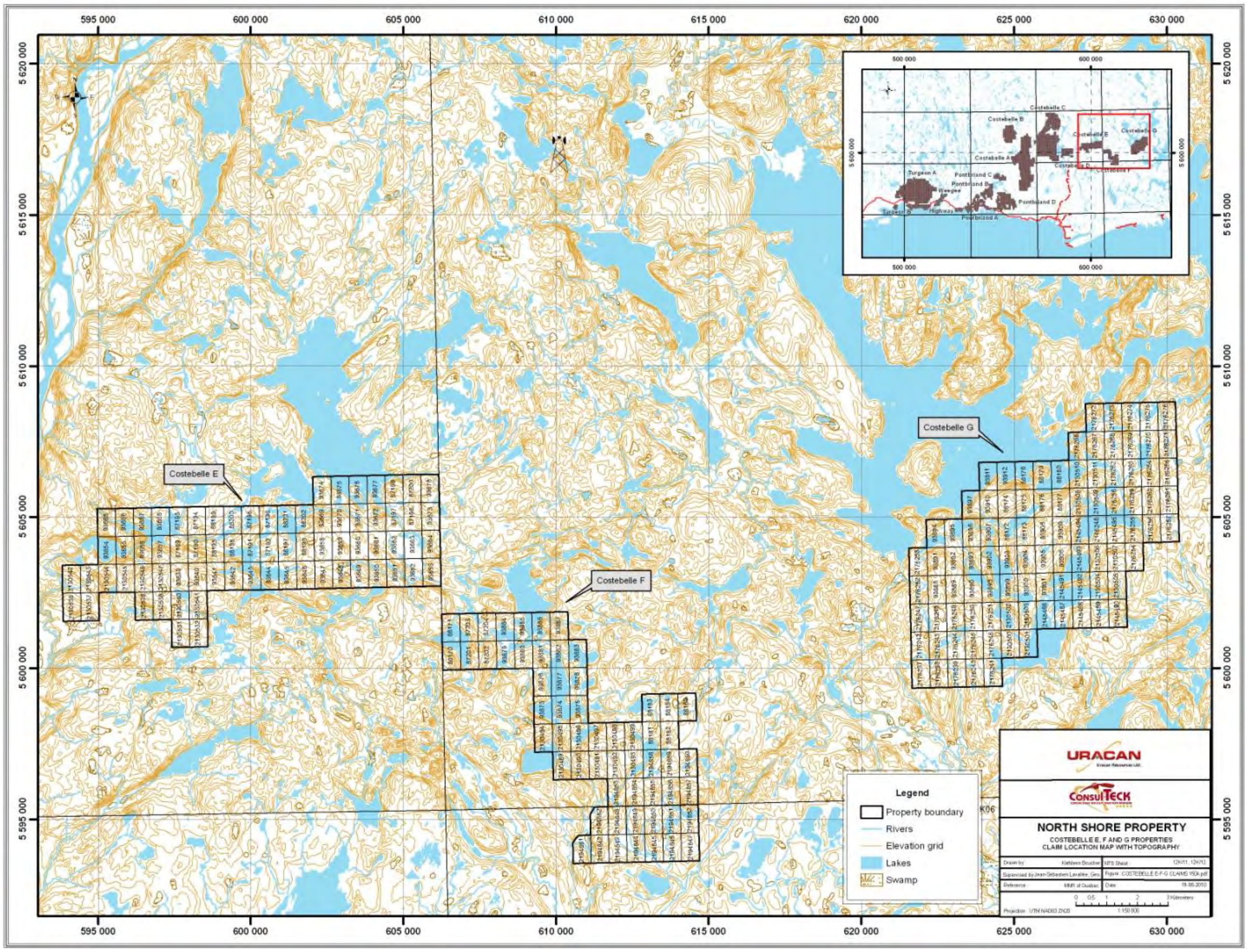
North Shore Property Claim Locations



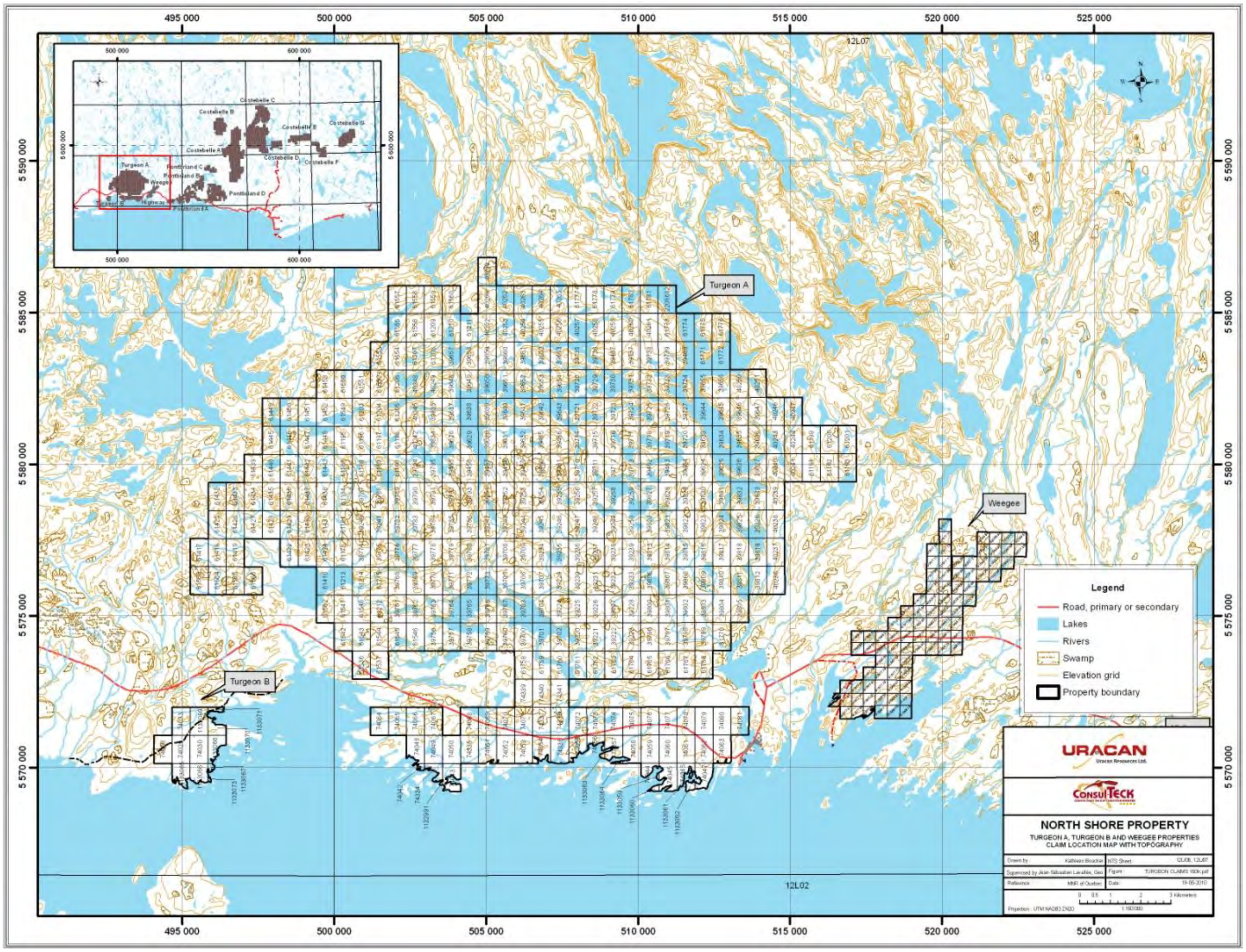
Costebelle A and B Claim Location



Costebelle C and D Claim Location



Costebelle E, F, and G Claim Location



Turegeon A, B, and Weegee Claim Location

Appendix C

An Investigation into Uranium Recovery from The North Shore Property, Final Report by SGS Canada Inc.

An Investigation into

URANIUM RECOVERY FROM THE NORTH SHORE PROPERTY

prepared for

URACAN RESOURCES

Project 12417-00 – Final Report
March 2, 2011

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Introduction

SGS Minerals Services in Lakefield, Ontario was requested to complete a metallurgical test program examining uranium recovery from ore samples originating from the North Shore property on behalf of Uracan Resources Ltd.

The testwork was directed by Mr. Marc Simpson of Uracan Resources. The testwork comprised of sample receipt, sample preparation, head analysis, agitated leach tests, uranium recovery and tailings neutralization.

This report summarizes the leach testwork performed under SGS Project 12417-001.

Results were provided to Mr. Marc Simpson as they became available throughout the course of the testwork.

James Brown, MASc, P.Eng.,
Project Manager, Metallurgical Operations

Iain A. Todd, Manager
Hydrometallurgical Group

Experimental work by: Micheal Archer
Report preparation by: James Brown
Reviewed by: Iain Todd

Testwork Summary

1. Sample Receipt & Description

SGS received three rice bags totalling ~130 kg of ore samples on May 13th, 2010 – the shipment was assigned Sample Receipt Number 0161-MAY10. The samples were from three zones: Double S (SS), TJ Zone (TJ) and Middle Zone (MZ). The corresponding sample IDs provided by the client are presented in Table 1 along with the instructions for preparation of the composites. Essentially all samples from each zone were combined, crushed to -10 mesh (if necessary) and thoroughly blended. A portion of each was split to make up an Overall Composite.

Head samples from each of the 3 individual composites and the Overall Composite were split and submitted for analysis. The head analysis for each of the composites is listed in Table 2. Each of the samples was found to contain ~0.02% uranium. The carbonate (CO_2) content was found to be low; suggesting acid consumption during leaching would be minimal.

Test charges, 1 kg each, were representatively split from each composite for the metallurgical testwork.

Table 1: North Shore Received Sample List & Prep Instructions

File	ID	Zone	Hole	Sample	Rec'd Weight, g	From	To	Length	Est. U_3O_8%	Prep. Instructions
TB08127356	40456	TJ	TJ-08-16	711220	3648	173.15	174.65	1.5	0.013	Blend all TJ Samples, take to -10 mesh if necessary, riffle out 6 kg for Overall Composite and split remaining into 1 kg charges
TB08134018	41829	TJ	TJ-08-25	712681	1046	19.1	20.6	1.5	0.013	
TB08131064	39456	TJ	TJ-08-11	711650	2895	201.5	203	1.5	0.015	
VO08142109	42646	TJ	TJ-08-29	714631	3461	173.2	174.7	1.5	0.015	
VO08036075	37585	TJ	TJ-08-01	931736	2979	39.2	40.7	1.5	0.013	
VO08103793	38827	TJ	TJ-08-08	G0572384	3331	92.5	94	1.5	0.015	
VO08036076	14783	MZ	MZ-08-13	930982	3012	145.2	146.7	1.5	0.013	Blend all MZ Samples, take to -10 mesh if necessary, riffle out 6 kg for Overall Composite and split remaining into 1 kg charges
VO08100795	17761	MZ	MZ-08-31	935894	2851	34.9	36.4	1.5	0.014	
VO08024959	13928	MZ	MZ-08-09	928262	1840	107	107.9	0.9	0.013	
SD08061169	15698	MZ	MZ-08-19	961374	2980	32.9	34.4	1.5	0.012	
VO08013809	12517	MZ	MZ-08-02	576333	3238	195.8	197.3	1.5	0.013	
VO08090254	16811	MZ	MZ-08-25	934600	2869	96.55	98.05	1.5	0.013	
VO07131740	27885	SS	SS-07-59	573285	1283	13.5	15	1.5	0.015	Blend all SS Samples, take to -10 mesh if necessary, riffle out 6 kg for Overall Composite and split remaining into 1 kg charges
SD07152981	30091	SS	SS-07-66	575369	2225	235.15	236.65	1.5	0.013	
SD07153578	29024	SS	SS-07-62	574421	3204	65	66.5	1.5	0.013	
SD07154788	29420	SS	SS-07-63	574701	3156	203	204.5	1.5	0.013	
SD07154832	29515	SS	SS-07-64	574795	3049	36.5	38	1.5	0.012	
VO09096812	35610	SS	SS-09-93	44750	3213	142.14	143.64	1.5	0.015	

Table 2: North Shore Composite Head Analyses

Sample ID	TJ Zone	Double S	Middle Zone	Overall Comp
		XRF		
U %	0.02	0.02	0.02	0.02
Th %	0.02	0.01	0.01	0.01
		Whole Rock Analysis (X-ray)		
SiO_2 %	74.4	72.4	71.3	72.6
Al_2O_3 %	12.8	13.5	14.3	13.6
Fe_2O_3 %	1.6	1.64	2.41	1.82
MgO %	0.17	0.31	0.49	0.36
CaO %	1.25	1.14	1.41	1.25
Na_2O %	3.3	2.87	3.71	3.3
K_2O %	5.06	6.22	5.09	5.43
TiO_2 %	0.14	0.18	0.27	0.21
P_2O_5 %	0.18	0.13	0.16	0.17
MnO %	0.02	0.02	0.03	0.02
Cr_2O_3 %	< 0.01	< 0.01	< 0.01	0.02
V_2O_5 %	< 0.01	< 0.01	< 0.01	< 0.01
LOI %	0.66	0.83	0.56	0.67
Sum %	99.6	99.2	99.7	99.4
		LECO		
S %	< 0.01	< 0.01	< 0.01	< 0.01
S= %	< 0.05	< 0.05	< 0.05	< 0.05
CO_2 %	< 0.05	0.14	< 0.05	< 0.05
		ICP-OES		
Ag g/t	< 2	< 2	< 2	< 2
As g/t	< 30	< 30	< 30	< 30
Ba g/t	320	430	330	360
Be g/t	3.1	1.9	3.8	3.1
Bi g/t	< 20	< 20	< 20	< 20
Cd g/t	< 2	< 2	< 2	< 2
Co g/t	< 8	< 8	< 8	< 8
Cu g/t	5	9	4	6
Li g/t	< 30	< 30	< 30	< 30
Mo g/t	< 10	< 10	< 10	< 10
Ni g/t	< 20	< 20	< 20	< 20
Pb g/t	< 80	< 80	< 80	< 80
Sb g/t	< 10	< 10	< 10	< 10
Se g/t	< 30	< 30	< 30	< 30
Sn g/t	< 20	< 20	< 20	< 20
Sr g/t	120	100	150	120
Tl g/t	< 30	< 30	< 30	< 30
U g/t	110	120	100	130
Y g/t	110	60	70	79
Zn g/t	6	14	32	21

2. Uranium Leach Testwork

Two leach methods were tested on the received North Shore samples, bottle roll leach tests were used to evaluate the amenability to heap leaching and conventional agitated tank leaching was also tested.

2.1. Coarse Ore Bottle Rolls

2.1.1. Test Procedures

Seven bottle roll leach tests were performed on -10 mesh material. The tests were run at 30% solids and room temperature. Ferric sulphate was added to the leach liquor at the start of the test to simulate a recycled acid stream used as the lixiviant, a target of 1 g/L ferric iron was used. The pH was maintained with additions of sulphuric acid. The bottles were mounted on a roll table with a timer programmed to roll the bottles one minute of every hour. This was done to minimize attrition within the bottles and better simulate a heap leach. Thief samples were taken after 1, 2, 5, 7 and 14 days to gauge uranium dissolution kinetics. The final PLS and residue was analyzed by ICP. Complete test procedures are included in the appendix.

2.1.2. Bottle Roll Leach Test Results

The bottle roll test series was set up to test the effect of acid strength on the leachability of the ore. Each of the 3 variability composites (TJ, MZ and SS) was leached under moderate acid conditions. The results are listed in Table 3. Under all levels of acid addition tested, the final leach residue uranium grade was <20 g/t (below the analytical detection limit by ICP-OES), equating to a recovery of greater than 85%. Acid addition was 20 kg/t for pH 1.7, 54 kg/t for pH 1.4 and over 200 kg/t for pH 1.2. The B1, B2, B5 and B6 were overdosed with oxidant ($NaClO_3$) so test B7 was conducted as a repeat of test B1 – oxidant is generally required to render any uranium in the tetravalent state soluble. The ferric iron added to the leach solution would be nearly sufficient to accomplish this and little or no additional oxidant should have been added. Tests B3, B4 and B7 all used 1 kg/t or less of $NaClO_3$ (none was added to B4).

Table 3: Bottle Roll Leach Test Results

Test No.	Sample	H_2SO_4, kg/t	Avg. pH	Avg. EMF, mV	Fe, mg/L	Fe^{2+}, mg/L	U, mg/L	U Extraction, %
B1	Overall Comp	203.6	1.17	791	2900	<5	43	>85
B2	Overall Comp	54.1	1.41	745	2300	<5	42	>84
B3	Overall Comp	19.5	1.71	566	1400	15	40	>83
B4	Comp TJ	57.5	1.45	517	2500	950	42	80
B5	Comp MZ	54.6	1.42	737	2500	<5	34	>81
B6	Comp SS	65.4	1.34	733	2500	<5	40	>83
B7	Overall Comp	144.9	1.21	513	2800	945	39	>84

The dissolution of uranium in the bottle roll tests was quite fast, with uranium in solution at or near final tenors (those listed in Table 3 are at 14 days) after just 1 day. Detailed final PLS characterization is listed in Table 4.

Table 4: Bottle Roll Final Leach PLS ICP Scans

Sample ID	B-1 Final PLS	B-2 Final PLS	B-3 Final PLS	B-4 Final PLS	B-5 Final PLS	B-6 Final PLS	B-7 Final PLS
U mg/L	43	42	40	42	34	40	39
Fe mg/L	2900	2300	1400	2500	2500	2500	2800
Fe2+ mg/L	< 5	< 5	15	950	< 5	< 5	945
Ag mg/L	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Al mg/L	1000	650	300	430	840	710	950
As mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3
Ba mg/L	0.1	0.1	0	0	0	0.08	0.1
Be mg/L	0.1	0.1	0	0	0	0.08	0.1
Bi mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ca mg/L	710	730	600	700	710	670	540
Cd mg/L	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Co mg/L	1	< 1	< 1	< 1	< 1	< 1	1.1
Cr mg/L	2.1	1.7	1	2	2	1.5	1.8
Cu mg/L	0.9	0.6	0	0	0	0.9	< 0.5
K mg/L	500	320	110	130	490	290	470
Li mg/L	4	3	< 2	< 2	3	2	4
Mg mg/L	710	460	190	310	650	460	700
Mn mg/L	49	35	20	30	42	36	46
Mo mg/L	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Na mg/L	2500	2500	150	39	2900	2500	25000
Ni mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1
P mg/L	250	240	130	290	250	170	230
Pb mg/L	< 5	< 5	< 5	< 5	< 5	< 5	3
Sb mg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Se mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3
Sn mg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sr mg/L	1.6	1.5	1	2	2	1.3	1.5
Ti mg/L	130	67	11	36	93	68	120
Tl mg/L	< 3	< 3	< 3	< 3	< 3	< 3	< 3
U mg/L	43	42	40	42	34	40	39
V mg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2
W mg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Y mg/L	9.9	9.6	8	12	10	5.7	9.1
Zn mg/L	7.4	4.5	2	4	7	3.8	6.9

2.2. Agitated Leach Tests

2.2.1. Test Procedures

In order to determine the grinding characteristics, 1-kg charges of each composite were ground in a ball mill for 5 minutes and 20 minutes and the final particle size was measured. Using this grind information the feed samples for the agitated leaches were ground for the appropriate time to achieve a target P_{80}. The ground solids were then completely transferred to the leach test. Each test was run at 50% (w/w) solids in a 3-L reaction kettle.

Free acidity, pH, ORP and temperature were all manually measured and recorded periodically throughout the leach. The oxidation potential (ORP, vs. Ag|AgCl, sat'd KCl) was maintained above 500 mV using 200 g/L sodium chlorate ($NaClO_3$). Each of these tests was run for 24 hours. The target leach conditions are listed in Table 5. Kinetic thief samples were withdrawn from the reaction kettle at time intervals and the pregnant leach solution (PLS) was assayed for total iron, iron (II), and uranium while the residue was assayed for uranium. A sample of the PLS and residue were also submitted at the conclusion of the tests with the PLS assayed for iron (II), uranium, and a full ICP scan and the residue assayed for uranium.

Complete test procedures and details are included in the appendix.

Table 5: Agitated Leach Test Conditions

Test ID	Sample	Grind	Target P80, µm	Feed Density, w/w%	Temperature, ºC	Acid Target, FA g/L H_2SO_4	EMF Target, mV w $NaClO_3$	Sampling
AL-1	Overall Comp	20.25 min	50	50	50	20	500 - 550	2, 6, 12, 24
AL-2	Overall Comp	15.5 min	150	50	50	20	500 - 550	2, 6, 12, 24
AL-3	Overall Comp	15.5 min	150	50	50	5	500 - 550	2, 6, 12, 24
AL-4	Overall Comp	15.5 min	150	50	50	pH 1.8	500 - 550	2, 6, 12, 24
AL-5	Overall Comp	15.5 min	150	50	75	20	500 - 550	2, 6, 12, 24
VAL-1	Comp TJ	15.5 min	150	50	50	5	500 - 550	2, 6, 12, 24
VAL-2	Comp SS	15.5 min	150	50	50	5	500 - 550	2, 6, 12, 24
VAL-3	Comp MZ	15.5 min	150	50	50	5	500 - 550	2, 6, 12, 24

2.2.2. Agitated Leach Test Results

The results from the agitated leach tests are listed in Table 6.

Table 6: Agitated Leach Test Results

Test ID	Sample	Grind P80, µm	Avg. Temp., ºC	Acid Add'n, kg/t	$NaClO_3$ Add'n, kg/t	Avg. pH	Final FA, g/L H_2SO_4	PLS Fe, mg/L	PLS Fe^{2+}, mg/L	PLS U, mg/L	U Extraction, %
AL-1	Overall Comp	55	52	59.1	1.5	0.75	16	7100	1780	110	88
AL-2	Overall Comp	90	50	56.9	1.1	0.84	18	7100	2910	110	89
AL-3	Overall Comp	90	51	48.8	1.0	1.21	22	5900	2460	100	88
AL-4	Overall Comp	90	51	23.1	1.7	1.64	2	2900	45	100	86
AL-5	Overall Comp	90	75	62.8	1.6	0.89	17	8300	2270	120	90
VAL-1	Comp TJ	*95*	52	27.9	1.0	1.44	4	4540	805	100	91
VAL-2	Comp SS	*95*	51	33.5	1.5	1.56	4	4300	165	113	91
VAL-3	Comp MZ	*95*	51	30.1	1.6	1.47	4	4420	70	97	86

AL-3 was overdosed with acid at the 12 hour mark, the free acid level until that point had been ~5 g/L but this was increased to ~20 g/L for the last 12 hours of the leach.

The leach kinetics are illustrated in Figure 1, generally most of the leaching took place in the first 6 hours. Faster dissolution kinetics were observed for the tests with harsher leach conditions, namely test AL-5 which was conducted at a higher temperature (75°C versus 50°C).

The PLS solutions from the agitated leach tests were analyzed by ICP for detailed characterization (results are listed in Table 7).

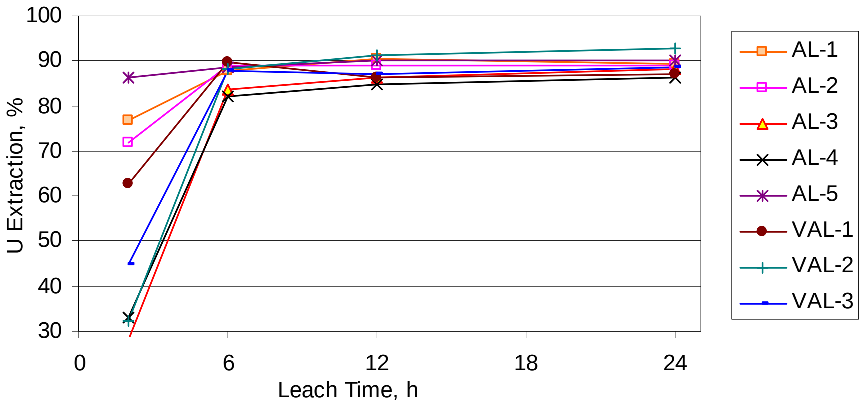


Figure 1: Agitated Leach Kinetics

Table 7 also includes the ICP scan for a bulk leach conducted to produce leach residue for tailings neutralization work (discussed in the subsequent section). Thorium analysis was added to this solution and based on the 59 mg/L Th in solution it can be estimated that roughly two thirds of the contained thorium was solubilised during the leach (from ~100 g/t in the ore composite).

Table 7: Agitated Leach PLS ICP Scans

Sample ID	AL-1 PLS Final	AL-2 PLS Final	AL-3 PLS Final	AL-4 PLS Final	AL-5 PLS Final	Bulk Final PLS
Ag mg/L	< 0.09	< 0.5	< 0.5	< 0.08	< 0.5	< 0.1
Al mg/L	1900	1900	1700	720	2500	2000
As mg/L	< 3	< 3	< 3	< 3	< 3	4
Ba mg/L	0.3	0.2	0.3	< 0.05	0.3	0.3
Be mg/L	0.3	0.3	0.3	0.2	0.4	0.3
Bi mg/L	< 1	< 1	< 1	< 1	< 1	< 1
Ca mg/L	930	860	920	730	940	950
Cd mg/L	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09	< 0.09
Co mg/L	< 2	2	2	< 1	2	4.7
Cr mg/L	46	29	26	26	32	35
Cu mg/L	7.1	4.7	4.2	3.8	4.9	65
Fe mg/L	7100	7100	5900	2900	8300	6400
Fe2+ mg/L	1780	2910	2460	45	2270	2480
K mg/L	640	640	580	30	950	670
Li mg/L	7	7	6	2	10	6
Mg mg/L	1200	1200	1000	360	1600	1200
Mn mg/L	92	92	84	47	110	91
Mo mg/L	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	27
Na mg/L	430	340	300	460	510	350
Ni mg/L	4	3	7	3	3	10
P mg/L	610	590	560	250	470	630
Pb mg/L	11	10	9	< 5	13	10
Sb mg/L	< 1	< 1	< 1	< 1	< 1	< 1
Se mg/L	< 3	< 3	< 3	< 3	< 3	< 3
Sn mg/L	< 2	< 2	< 2	< 2	< 2	< 2
Sr mg/L	3.5	3.5	3.2	0.8	4.1	3.5
Ti mg/L	140	150	130	4.2	130	150
Tl mg/L	< 3	< 3	< 3	< 3	< 3	< 3
U mg/L	110	110	100	100	120	130
Th mg/L	-	-	-	-	-	59.3
V mg/L	3.7	3.7	3	0.8	4.6	6.1
W mg/L	< 2	< 2	< 2	< 2	< 2	< 2
Y mg/L	24	24	23	17	26	25
Zn mg/L	13	11	11	5	15	12

3. Uranium Recovery from Solution

The PLS from the bottle roll and agitated leach tests was combined and used for solvent extraction and ion-exchange testwork.

3.1. Solvent Extraction

A conventional Alamine336 solvent (2.5% extractant, 2.5% isodecanol modifier in diluent) was used to extract uranium from the solution phase in a series of shakeout tests at various organic to aqueous ratios. Due to the low concentration in the PLS however, a loading isotherm could not be generated. Despite this the uranium was effectively transferred from the solution phase to the organic phase with good phase separation and clarity under all conditions tested. The raffinate at an O/A of 1:1 contained 4 mg/L U. Complete details are included in the appendix.

3.2. Strong Base Anion Exchange

The same PLS used for the solvent extraction work was used for scoping level IX testwork using a commercial large bead (~0.9 mm) strong base anion exchange resin (A660/4759 manufactured by Purolite Corporation).

3.2.1. Test Procedures

Aliquots of PLS and conditioned resin at various resin to solution ratios were placed in bottles and rolled for 24 h to allow equilibrium to be reached. After 24 hours the solution was sampled for analysis.

3.2.2. IX Results

An IX loading isotherm is shown in Figure 2, the feed PLS contained 69 mg/L uranium. With 8 mL/L resin (wet settled resin to aqueous solution volume), the barren solution contained 31 mg/L uranium. Due to the low uranium tenors the loading on the resin is relatively low, at ~12 g/L. Barren concentrations of <1 mg/L are likely achievable by altering the test conditions.

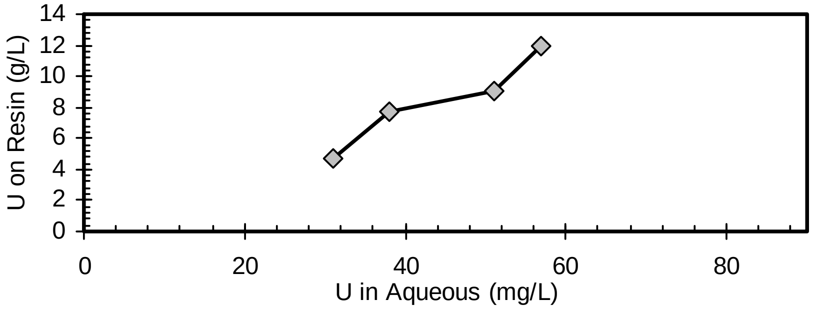


Figure 2: Uranium Loading on A660 Resin

4. Environmental Characterisation & Tailings Neutralization

4.1. Head Samples

The head samples were submitted for Acid-Base Accounting (ABA) and Net Acid Generation (NAG) testing and results are listed in Table 9 and Table 8. The samples all have low carbonate and low sulphur/sulphide contents. Regardless of the low Net NP (due to the combination of both low AP and NP) the samples do not contain any sulphides to oxidize to generate acid. The High NP/AP suggests that the samples have more than a satisfactory amount of total NP to neutralize the acid that might be generated. If we look at carbonate, the samples have carbonate NP values of 1.18, 5.23, 1.39 and 2.94, respectively. This results in carbonate NP/AP values of 3.8, 16.9, 4.48 and 9.48, respectively. These values are all greater than the value of 3 which is generally considered to be adequate for samples that are consuming carbonate to actively neutralize acid rock drainage.

Table 8: Acid-Base Accounting (ABA) Test Results

Parameter	Unit	TJ	SS	MZ	Overall Comp
Paste pH	units	9.55	9.45	9.45	9.48
Fizz Rate	---	1	1	1	1
Sample weight	g	1.97	1.99	1.96	1.98
HCl added	mL	20.00	20.00	20.00	20.00
HCl	Normality	0.10	0.10	0.10	0.10
NaOH	Normality	0.10	0.10	0.10	0.10
NaOH to pH=8.3	mL	16.70	15.40	17.20	16.20
Final pH	units	1.11	1.16	1.14	1.17
NP	t $CaCO_3$/1000 t	8.4	11.6	7.1	9.6
AP	t $CaCO_3$/1000 t	0.31	0.31	0.31	0.31
Net NP	t $CaCO_3$/1000 t	8.09	11.3	6.79	9.29
NP/AP	ratio	27.1	37.4	22.9	31.0
S	%	< 0.005	0.007	< 0.005	< 0.005
SO_4^-S	%	< 0.01	< 0.01	< 0.01	< 0.01
Sulphide-S	%	< 0.01	< 0.01	< 0.01	< 0.01
C	%	0.041	0.093	0.037	0.059
CO_3	%	0.071	0.315	0.084	0.177
CO_3 NP	t $CaCO_3$/1000 t	1.18	5.23	1.39	2.94
CO_3 Net NP	t $CaCO_3$/1000 t	0.87	4.92	1.08	2.63
CO_3 NP/AP	ratio	3.80	16.87	4.50	9.48

Table 9: Net Acid Generation (NAG) Test Results

Parameter	Unit	TJ	SS	MZ	Overall Comp
Sample weight	g	1.46	1.53	1.47	1.52
Vol H_2O_2	mL	150	150	150	150
Final pH	units	7.12	7.86	7.13	7.27
NaOH	Normality	0.10	0.10	0.10	0.10
Vol NaOH to pH 4.5	mL	0.00	0.00	0.00	0.00
Vol NaOH to pH 7.0	mL	0.00	0.00	0.00	0.00
NAG@pH 4.5	kg H_2SO_4/t	0	0	0	0
NAG@pH 7.0	kg H_2SO_4/t	0	0	0	0

The ABA results for samples show that there is sufficient alkalinity to neutralize all the acid that is theoretically possible to be generated based on the sulphide content. Regardless, based on the non-detectable sulphide content there is no concern of ARD. The NAG tests confirm that the samples will not generate significant quantities of acid even when exposed to severe oxidizing conditions under optimal conditions.

4.2. Tailings Neutralization

4.2.1. Test Procedures

A bulk leach was conducted to generated sufficient fresh residue for neutralization. The barren solution produced in the IX testing (conducted again with excess resin to deplete the uranium to 2 mg/L) was then combined with washed leach residue at 33% solids. A barium chloride dosage of 250 mg/L was used to precipitate any Ra226. The mixture was agitated at room temperature and the slurry pH was raised to 5.5 using 30% limestone slurry. A solution sample was withdrawn after 1 hour and then the slurry pH was further raised to pH 10 using 20% lime slurry. The pH was maintained above 9 for 2 hours and a final solution and residue sample were collected.

4.2.2. Results

Limestone requirement to raise the pH to 5.5 was 81 kg/t (dry equivalent) and an additional 22 kg/t of hydrated lime (dry equivalent) was required to raise the pH to 10 and maintained for 2 hours above 9.

The solution analysis at pH 5.5 and the final neutralized liquor are listed in Table 10, while elemental analysis of the final tailings solids is listed in Table 11. All mandated elements were found to be below the 2007 World Bank standard. Radium in the solution was below the Metal Mining Effluent Regulations of 0.37 Bq/L.

The neutralized residue was also subjected to acid-base accounting and net acid generation test procedures, results are listed in Table 12 and Table 13 respectively.

While modified ABA testing of the neutralised residue reported a total Net NP value in excess of 20 t $CaCO_3$/1000, carbonate (CO_3) analysis indicated that much of this total NP (50%) is from less reactive sources. Although the resultant CO_3 Net NP value (12.8 t $CaCO_3$/1000 t) suggests increased uncertainty with regards to the availability and reactivity of this NP, the very low sulphide concentration (<0.01%), coupled with the extremely high CO_3 NP/AP ratio (41), indicates that the neutralised residue is highly unlikely to generate acidity. The non-acid forming nature of this sample was corroborated by the NAG test results which reported no net acidity generated and a highly alkaline final pH value (10.58) after aggressive oxidation of the sample.

Table 10: Tailings Neutralization Solution Analysis

Sample ID	World Bank, 2007	Neut 1 pH 5.5 FILT	Neut 1 pH 10 FILT
Ra226 Bq/L			0.19
Hg mg/L	0.002	---	0.0001
Ag mg/L		---	< 0.005
Al mg/L		---	6.7
As mg/L	0.1	< 0.3	< 0.3
Ba mg/L		---	0.1
Be mg/L		---	< 0.002
Bi mg/L		---	< 0.02
Ca mg/L		---	450
Cd mg/L	0.05	---	< 0.005
Co mg/L		---	< 0.02
Cr mg/L		---	< 0.05
Cu mg/L	0.3	---	0.06
Fe mg/L	2	2.8	< 0.2
K mg/L		---	220
Li mg/L		---	1.2
Mg mg/L		---	7.3
Mn mg/L		---	< 0.04
Mo mg/L		---	0.3
Na mg/L		---	2100
Ni mg/L	0.5	---	< 0.05
P mg/L		---	< 5
Pb mg/L	0.2	---	< 0.01
Sb mg/L		---	< 0.02
Se mg/L		---	< 0.3
Sn mg/L		---	< 0.05
Sr mg/L		---	2.7
Ti mg/L		---	< 0.02
Tl mg/L		---	< 0.01
U mg/L		0.5	0.01
V mg/L		---	< 0.05
W mg/L		---	< 0.01
Y mg/L		---	< 0.005
Zn mg/L	0.5	---	< 0.05

* _World Bank Environment, Health and Safety Guidelines for Mining, 2007._

The elemental analysis of the tailings solids is listed in Table 11.

Table 11: Elemental Analysis of Tailings Solids

Sample ID	Neut 1 RES Final
Ag g/t	0.3
Al g/t	58000
As g/t	< 10
Ba g/t	670
Be g/t	2.5
Bi g/t	< 0.6
Ca g/t	43000
Cd g/t	< 0.2
Co g/t	2.5
Cr g/t	180
Cu g/t	9.2
Fe g/t	12000
K g/t	37000
Li g/t	11
Mg g/t	2500
Mn g/t	180
Mo g/t	4.4
Na g/t	21000
Ni g/t	7
P g/t	510
Pb g/t	43
Sb g/t	< 0.8
Se g/t	< 10
Sn g/t	2
Sr g/t	350
Th g/t	44.1
Ti g/t	1000
Tl g/t	1.1
U g/t	9.5
V g/t	5
Y g/t	82
Zn g/t	28

Table 12: Neutralized Residue ABA Results

Parameter	**Unit**	**Neut 1 Res Final**
Paste pH	units	8.57
Fizz Rate	---	2
Sample weight	g	1.98
HCl added	mL	29.60
HCl	Normality	0.10
NaOH	Normality	0.10
NaOH to pH=8.3	mL	19.55
Final pH	units	1.58
NP	t $CaCO_3$/1000 t	25.4
AP	t $CaCO_3$/1000 t	0.31
Net NP	t $CaCO_3$/1000 t	25.1
NP/AP	ratio	81.9
S	%	2.04
SO_4^-S	%	2.04
Sulphide-S	%	<0.01
C	%	0.273
CO_3	%	0.774
CO_3 NP	t $CaCO_3$/1000 t	12.8
CO_3 Net NP	t $CaCO_3$/1000 t	12.5
CO_3 NP/AP	ratio	41.4

Table 13: Neutralized Residue NAG Results

Parameter	Unit	Neut 1 Res Final
Sample weight	g	1.49
Vol H_2O_2	mL	150
Final pH	units	10.58
NaOH	Normality	0.10
Vol NaOH to pH 4.5	mL	0.00
Vol NaOH to pH 7.0	mL	0.00
NAG@pH 4.5	kg H_2SO_4/t	0
NAG@pH 7.0	kg H_2SO_4/t	0

Conclusions and Recommendations

Based on the results, the following conclusions can be made:

- Three individual composites and one overall composite were prepared for metallurgical testing from the TJ, MZ and SS zones of the North Shore property. The composites were found to assay between 100 and 130 g/t uranium.
- The uranium was effectively leached in gentle agitated bottles from – 10 mesh ore with extractions greater than 85%. Sulphuric acid requirements were moderate at ~20 kg/t.
- Under heated agitated leach conditions uranium extractions were ~90% with ~30 kg/t sulphuric acid additions. Sodium chlorate was added at a rate of ~1 kg/t to provide oxidation.
- The leach liquors were treated by conventional solvent extraction and ion-exchange; however, due to the low uranium tenors (an artefact of the low ore grade) results were somewhat inconclusive. Nevertheless the uranium was effectively recovered from the acid solutions by both SX and IX.
- The leach residue was neutralized with ~81 kg/t limestone and ~22 kg/t hydrated lime to final pH of about 9. The resultant effluent was quite clean.

Future metallurgical testwork should be concentrated on heap leaching due the low grade nature of the ore. Additional bottle roll tests on coarse crushed ore should be completed to determine to optimum crush size and further refine the reagent requirements. Column testing would eventually be required on larger samples to confirm uranium extractions. This would produce ample leach liquor to optimize the downstream recovery of uranium from the leach solution.

Appendix A – Bottle Roll Leach Details

Project No. **12417-001** **Project Technologist:** Jacek Dirycz
Client: **Uracan** **Date of Test:** May 31,2010

Test: B1

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
203.5968

Feed: Overall Comp

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	500	g
Moisture	0	%
Dry Feed Weight	500.0	g
Water added:	1166.7	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.2	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL **or to maintain 500 mV**
Crush	10	mesh
ORP	500	mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition	1	g/L
$Fe_2(SO_4)_3$	4.2	g ferric sulphate salt

Notes:

bottle tare with lid:	222.9	g
bottle tare without lid:	222.9	g
dry feed + bottle + lid:	722.9	g
final wt (including bottle and lid)		g

Test Details:

Elapsed Time day	date	Temp (°C)	pH	emf (mV)	Reagents Added H_2SO_4 (g)	$NaClO_3$ (mL)	$Fe_2(SO_4)_3$ (g)	Comments
0	31-May-10	27.4	1.22	555	30.9		4.2	start test
2h	31-May-10	25.2	1.23	460				
1	01-Jun-10	24.6	1.20	515		76.2		
1	01-Jun-10	24.5	1.20	853				
1	01-Jun-10	24.0	1.20	853				sample 1
2	02-Jun-10	21.5	1.23	820				sample 2
4	04-Jun-10	20.9	1.34	967	27.5			sample 3
7	07-Jun-10	20.4	1.35	1010	47.6			new pH probe, sample 4
14	14-Jun-10	22.1	0.56	1089				brand new probes, end test
		23.4		Totals	106.0	76.2	4.2	g, mL, g
					203.6	30.5	8.4	kg/t
				Final pulp weight			1.0	kg Fe/t

Test: B1

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
203.5968

	Pulp weight	**PLS Filtrate**	**Wash Filtrate**	**Wet Residue**	**Dry Residue**	**Cake Moisture[2]** (unwashed residue)		**PLS Filtrate**			
								pH	emf[1]	sg	Free Acid
Sample	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	36	33.9						1.2	853	1.029	34
2 d	51	47.5						1.23	820	1.029	29
4 d	49	45.3						1.34	967	1.029	15
7 d	47	43.0						1.35	1010	1.046	35
14 d	50	45.3						0.56	1089	1.070	71
Final	1624	1056	609.1	546	480	11%	61.7	0.69	1085	1.0703	71

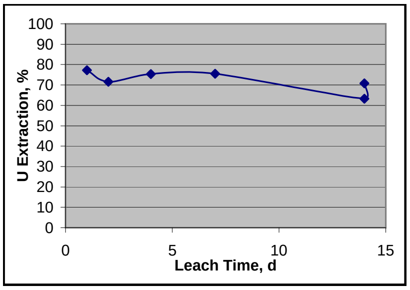
[1] (emf measured against Ag|AgCl sat'd KCl 600 mV buffer)

[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

Product	**Amt.** mL, g	**Assays, mg/L or g/t** Fe	Fe2+	U	**U Dist'n** %	**U Ext'n** %
Head	500			130		
1 d PLS	33	1210	<5	43	2.20	77.2
2 d PLS	46	1530	<5	41	2.93	71.5
4 d PLS	44	1930	<5	45	3.07	75.3
7 d PLS	41	2440	< 5	47	2.99	75.5
14 d PLS	42	2880	<5	41	2.69	63.2
Final PLS	1069	2900	<5	43	71.25	70.7
Residue	480			<20	14.87	**>85**
Calc'd Head				129	100.00	
Mass Balance (out/in%)						99.3
Calc'd wt. Loss						4%

Leach Kinetics:



Project No. **12417-001**
Client: **Uracan**

Project Technologist: Jacek Dirycz
Date of Test: May 31,2010

Test: B2

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
54.120676

Feed: Overall Comp

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	497	g
Moisture	0	%
Dry Feed Weight	497.2	g
Water added:	1160.1	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.5	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL
Crush	10	mesh
ORP	500	mV

or to maintain 500 mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition	1	g/L
$Fe_2(SO_4)_3$	4.2	g ferric sulphate salt

Notes:

bottle tare with lid:	216.5	g
bottle tare without lid:	216.5	g
dry feed + bottle + lid:	714	g
final wt (including bottle and lid):		g

Test Details:

Elapsed Time day	date	Temp (°C)	pH	emf (mV)	Reagents Added H_2SO_4 (g)	$NaClO_3$ (mL)	$Fe_2(SO_4)_3$ (g)	Comments
0	31-May-10	27.4	1.57	572	15.1		4.2	start test
2h	31-May-10	25.2	1.42	495				
1	01-Jun-10	24.6	1.28	448		73.2		
1	01-Jun-10	24.5	1.42	505				
1	01-Jun-10	21.5	1.41	840				sample 1
2	02-Jun-10	21.7	1.38	857				sample 2
4	04-Jun-10	21.1	1.47	968				sample 3
7	07-Jun-10	20.6	1.74	977	12.9			new pH probe, sample 4
14	14-Jun-10	22.1	1.04	1044				brand new probes, end test
		23.2		Totals	28.0	73.2	4.2	g, mL, g
					54.1	29.4	8.4	kg/t
				Final pulp weight			1.0	kg Fe/t

Test: B2

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
54.120676

	Pulp weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Cake Moisture[2] (unwashed residue)		PLS Filtrate			
								pH	emf[1]	sg	Free Acid
Sample	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	35	32.8						1.41	840	1.020	13
2 d	35	31.6						1.38	857	1.020	12
4 d	42	39.2						1.47	968	1.018	6
7 d	50	45.4						1.74	977	1.019	5
14 d	50	48.4						1.04	1044	1.026	12
Final	1566	1006	608.4	543	478	12%	62.5	1.04	1018	1.0264	12

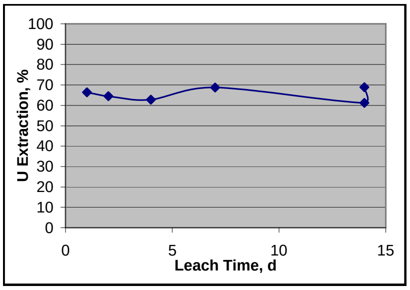
[1] (emf measured against Ag|AgCl sat'd KCl 600 mV buffer)

[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

Product	**Amt.** mL, g	**Assays, mg/L or g/t** Fe	Fe2+	U	**U Dist'n** %	**U Ext'n** %
Head	497			130		
1 d PLS	32	1070	<5	37	1.93	66.4
2 d PLS	31	1250	<5	37	1.86	64.6
4 d PLS	39	1430	<5	37	2.32	62.8
7 d PLS	45	1610	<5	42	3.04	68.8
14 d PLS	47	2140	<5	39	2.99	61.2
Final PLS	1060	2300	<5	42	72.32	68.9
Residue	478			<20	15.54	**>84**
Calc'd Head				124	100.00	
Mass Balance (out/in%)						95.2
Calc'd wt. Loss						4%

Leach Kinetics:



Project No.	**12417-001**	**Project Technologist:**	Jacek Dirycz
Client:	**Uracan**	**Date of Test:**	May 31,2010

Test: B3

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
19.453744

Feed: Overall Comp

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	499	g
Moisture	0	%
Dry Feed Weight	499.4	g
Water added:	1165.3	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.8	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL **or to maintain 500 mV**
Crush	10	mesh
ORP	500	mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition	1	g/L
$Fe_2(SO_4)_3$	4.2	g ferric sulphate salt

Notes:

bottle tare with lid:	220.3	g
bottle tare without lid:	220.3	g
dry feed + bottle + lid:	719.7	g
final wt (including bottle and lid)		g

Test Details:

Elapsed Time		**Temp**	**pH**	**emf**	**Reagents Added**			**Comments**
day	**date**	**(°C)**		**(mV)**	**H_2SO_4 (g)**	**$NaClO_3$ (mL)**	**$Fe_2(SO_4)_3$ (g)**	
0	31-May-10	27.4	1.79	607	6.2		4.2	start test
2h	31-May-10	25.2	1.67	555				
1	01-Jun-10	24.6	1.69	527				
1	01-Jun-10	24.5	1.72	523				sample 1
2	02-Jun-10	21.7	1.70	518				sample 2
4	04-Jun-10	21.4	1.95	543	3.9			sample 3
7	07-Jun-10	20.8	1.80	591		2.6		new pH probe, sample 4
14	14-Jun-10	22.3	1.38	661				brand new probes, end test
		23.5		Totals	10.1	2.6	4.2	g, mL, g
					19.5	1.0	8.4	kg/t
				Final pulp weight			1.0	kg Fe/t

Test: B3

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
19.453744

	Pulp weight	**PLS Filtrate**	**Wash Filtrate**	**Wet Residue**	**Dry Residue**	**Cake Moisture[2]** (unwashed residue)		**PLS Filtrate**			
								pH	emf[1]	sg	Free Acid
Sample	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	27	24.8						1.72	523	1.007	5
2 d	56	53.5						1.7	518	1.007	3
4 d	48	45.0						1.95	543	1.005	2
7 d	46	43.1						1.8	591	1.010	4
14 d	46	42.7						1.38	661	1.007	2
Final	1470	907	604.9	546	487	11%	58.5	1.49	656	1.007	2

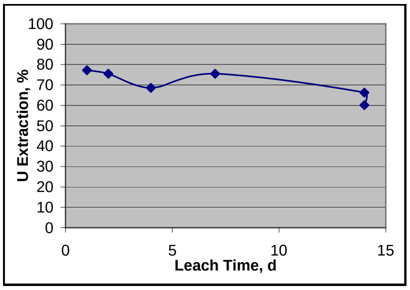
[1](emf measured against Ag|AgCl sat'd KCl 600 mV buffer)

[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

Product	**Amt.** mL, g	**Assays, mg/L or g/t** Fe	Fe2+	U	**U Dist'n** %	**U Ext'n** %
Head	499			130		
1 d PLS	25	910	56	43	1.83	77.2
2 d PLS	53	993	286	43	3.95	75.5
4 d PLS	45	1080	341	41	3.18	68.7
7 d PLS	43	1450	174	47	3.47	75.5
14 d PLS	42	1550	11	43	3.15	66.2
Final PLS	976	1400	15	40	67.57	60.2
Residue	487			<20	16.84	**>83**
Calc'd Head				116	100.00	
Mass Balance (out/in%)						89.0
Calc'd wt. Loss						3%

Leach Kinetics:



Project No. **12417-001** **Project Technologist:** Jacek Dirycz
Client: **Uracan** **Date of Test:** May 31,2010

Test: B4

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
57.4656

Feed: Comp TJ

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	500	g
Moisture	0	%
Dry Feed Weight	500.0	g
Water added:	1166.7	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.5	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL **or to maintain 500 mV**
Crush	10	mesh
ORP	500	mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition 1 g/L
$Fe_2(SO_4)_3$ 4.2 g ferric sulphate salt

Notes:

bottle tare with lid:	223.4	g
bottle tare without lid:	223.4	g
dry feed + bottle + lid:	723.4	g
final wt (including bottle and lid)		g

Test Details:

Elapsed Time day	date	Temp (°C)	pH	emf (mV)	Reagents Added H_2SO_4 (g)	$NaClO_3$ (mL)	$Fe_2(SO_4)_3$ (g)	Comments
0	31-May-10	27.4	1.51	587	13.1		4.2	start test
2h	31-May-10	25.2	1.50	544				
1	01-Jun-10	24.6	1.48	520				
1	01-Jun-10	24.5	1.49	510				sample 1
2	02-Jun-10	21.8	1.49	503				sample 2
4	04-Jun-10	21.4	1.51	514				sample 3
7	07-Jun-10	20.9	1.73	503	16.8			new pH probe, sample 4
14	14-Jun-10	22.3	0.92	455				brand new probes, end test
		23.5		Totals	29.9	0.0	4.2	g, mL, g
					57.5	0.0	8.4	kg/t
				Final pulp weight			1.0	kg Fe/t

Test: B4

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
57.4656

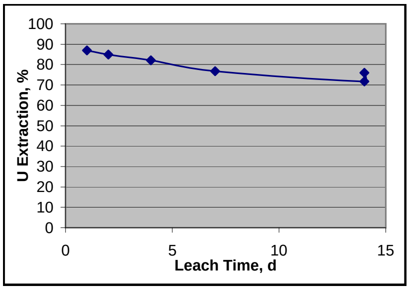
	Pulp weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Cake Moisture[2] (unwashed residue)		PLS Filtrate			
								pH	emf[1]	sg	Free Acid
Sample	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	31	28.5						1.49	510	1.013	12
2 d	41	38.3						1.49	503	1.013	12
4 d	48	45.5						1.51	514	1.010	6
7 d	48	44.2						1.73	503	1.012	5
14 d	49	145.5						0.92	455	1.023	18
Final	1500	940	609.4	545	482	11%	62.0	0.99	442	1.0234	18

[1] (emf measured against Ag|AgCl sat'd KCl 600 mV buffer)
[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

	Amt.	**Assays, mg/L or g/t**			**U Dist'n**	**U Ext'n**
Product	mL, g	Fe	Fe2+	U	%	%
Head	500			110		
1 d PLS	28	1660	384	41	1.74	87.0
2 d PLS	38	1850	500	41	2.34	84.9
4 d PLS	45	2100	576	41	2.79	82.1
7 d PLS	44	2070	647	40	2.64	76.8
14 d PLS	142	2480	906	39	8.38	71.8
Final PLS	996	2500	950	42	63.18	76.0
Residue	482			26	18.92	**80.4**
Calc'd Head				132	100.00	
Mass Balance (out/in%)						120.3
Calc'd wt. Loss						4%

Leach Kinetics:



Project No. **12417-001** **Project Technologist:** Jacek Dirycz
Client: **Uracan** **Date of Test:** May 31,2010

Test: B5

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
54.605153

Feed: Comp MZ

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	501	g
Moisture	0	%
Dry Feed Weight	500.7	g
Water added:	1168.3	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.5	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL
Crush	10	mesh
ORP	500	mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition	1	g/L
$Fe_2(SO_4)_3$	4.2	g ferric sulphate salt

or to maintain 500 mV

Notes:

bottle tare with lid:	220.6	g
bottle tare without lid:	220.6	g
dry feed + bottle + lid:	721.3	g
final wt (including bottle and lid)		g

Test Details:

Elapsed Time		Temp	pH	emf	Reagents Added			Comments
					H_2SO_4	$NaClO_3$	$Fe_2(SO_4)_3$	
day	date	(°C)		(mV)	(g)	(mL)	(g)	
0	31-May-10	26.2	1.50	556	16.2		4.2	start test
2h	31-May-10	25.6	1.46	500				
1	01-Jun-10	24.1	1.46	465		75.9		
1	01-Jun-10	24.2	1.36	505				
1	01-Jun-10	23.5	1.40	790				sample 1
2	02-Jun-10	21.5	1.41	862				sample 2
4	04-Jun-10	21.5	1.55	954	12.3			sample 3
7	07-Jun-10	21.0	1.54	1029				new pH probe, sample 4
14	14-Jun-10	22.4	1.10	975				brand new probes, end test
		23.3		Totals	28.5	75.9	4.2	g, mL, g
					54.6	30.3	8.4	kg/t
			Final pulp weight				1.0	kg Fe/t

Test: B5

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
54.605153

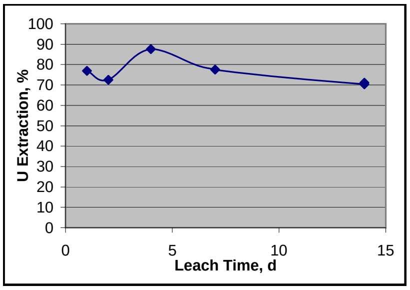
	Pulp weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Cake Moisture[2] (unwashed residue)		PLS Filtrate			
								pH	emf[1]	sg	Free Acid
Sample	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	36	34.2						1.46	790	1.021	15
2 d	42	39.4						1.41	862	1.021	13
4 d	50	47.3						1.55	954	1.020	6
7 d	47	44.8						1.54	1029	1.026	13
14 d	43	40.6						1.1	975	1.030	9
Final	1563	983	611.1	549	485	11%	62.0	1.15	968	1.03	9

[1](emf measured against Ag|AgCl sat'd KCl 600 mV buffer)
[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

	Amt.	Assays, mg/L or g/t			U Dist'n	U Ext'n
Product	mL, g	Fe	Fe2+	U	%	%
Head	501			100		
1 d PLS	33	1100	<5	33	2.11	77.0
2 d PLS	39	1280	<5	32	2.35	72.5
4 d PLS	46	1490	<5	40	3.53	87.6
7 d PLS	44	1900	<5	37	3.08	77.6
14 d PLS	39	2440	<5	35	2.63	70.3
Final PLS	1047	2500	<5	34	67.81	71.1
Residue	485			<20	18.49	**>81**
Calc'd Head				105	100.00	
Mass Balance (out/in%)						104.8
Calc'd wt. Loss						3%

Leach Kinetics:



Project No. **12417-001** **Project Technologist:** Jacek Dirycz
Client: **Uracan** **Date of Test:** May 31,2010

Test: B6

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
65.43274

Feed: Comp SS

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	500	g
Moisture	0	%
Dry Feed Weight	500.3	g
Water added:	1167.4	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.5	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL **or to maintain 500 mV**
Crush	10	mesh
ORP	500	mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition	1	g/L
$Fe_2(SO_4)_3$	4.2	g ferric sulphate salt

Notes:

bottle tare with lid:	225.3	g
bottle tare without lid:	225.3	g
dry feed + bottle + lid:	725.6	g
final wt (including bottle and lid)		g

Test Details:

Elapsed Time day	date	Temp (°C)	pH	emf (mV)	Reagents Added H_2SO_4 (g)	$NaClO_3$ (mL)	$Fe_2(SO_4)_3$ (g)	Comments
0	31-May-10	27.2	1.45	561	22.1		4.2	start test
2h	31-May-10	25.0	1.37	511				
1	01-Jun-10	24.0	1.32	473		73.8		
1	01-Jun-10	24.0	1.30	508				
1	01-Jun-10	23.5	1.37	750				sample 1
2	02-Jun-10	21.8	1.31	830				sample 2
4	04-Jun-10	21.6	1.31	951				sample 3
7	07-Jun-10	21.1	1.64	1035	12.0			new pH probe, sample 4
14	14-Jun-10	22.4	0.97	981				brand new probes, end test
		23.4		Totals	34.1	73.8	4.2	g, mL, g
					65.4	29.5	8.4	kg/t
				Final pulp weight			1.0	kg Fe/t

Test: B6

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
65.43274

Sample	Pulp weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Cake Moisture[2] (unwashed residue)		PLS Filtrate			
								pH	emf[1]	sg	Free Acid
	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	53	51.7						1.37	750	1.023	19
2 d	48	46.2						1.31	830	1.019	18
4 d	48	45.3						1.31	951	1.021	9
7 d	45	43.0						1.64	1035	1.021	8
14 d	45	42.2						0.97	981	1.032	14
Final	1546	984	614.3	548	484	11%	62.0	1.02	1020	1.0315	14

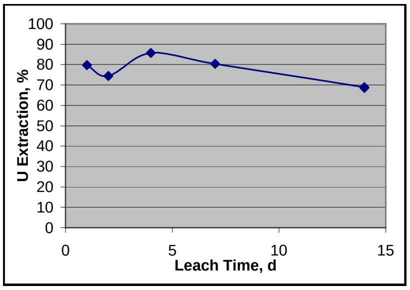
[1](emf measured against Ag|AgCl sat'd KCl 600 mV buffer)

[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

Product	Amt.	Assays, mg/L or g/t			U Dist'n	U Ext'n
	mL, g	Fe	Fe2+	U	%	%
Head	500			120		
1 d PLS	51	1140	<5	41	3.42	79.7
2 d PLS	45	1380	<5	40	2.99	74.4
4 d PLS	44	1610	<5	48	3.52	85.7
7 d PLS	42	1840	<5	47	3.27	80.4
14 d PLS	41	2390	<5	42	2.84	68.9
Final PLS	1030	2500	<5	40	68.00	68.6
Residue	484			<20	15.96	**>83**
Calc'd Head				121	100.00	
Mass Balance (out/in%)						100.9
Calc'd wt. Loss						3%

Leach Kinetics:



Project No. **12417-001** **Project Technologist:** Jacek Dirycz
Client: **Uracan** **Date of Test:** June01,2010

Test: B7

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
144.94678

Feed: Overall Comp

Procedure:

1. Place indicated volume of DI H_2O into bottle.
2. Record wt. of feed (~700 g dry). Add feed to bottle.
3. Add concentrated H_2SO_4 for target acidity; record weight of acid added.
4. Beware of foaming; add acid slowly and allow pH to stabilize.
5. Add ferric sulphate salt as indicated.
6. Place bottle on roll and set timer (revolutions 1 min/h).
7. Record pH, emf and temperature throughout the test. Add H_2SO_4 to **keep constant pH** (record amount added).
8. Starting at 1 day adjust the emf to target using NaClO3 (record amount added).
9. Sample bottle contents at 1, 2, 4, 8, and 14 days using 30 mL syringe.
10. Record wt. and vol. of sample.
11. Millipore the sample. Discard millipore paper and any solids into appropriate NORM garbage.
12. Record wt. and s.g. of filtrate (determine s.g. using 10 mL pipette).
13. Submit filtrate for analysis for U, Fe2+/Fe3+. **Submit final PLS for full ICP scan.**
14. At 14 days, stop rolls.
15. Record final weight of bottle. Filter contents; wash once with 300 mL pH 2.0 water, once with 300 mL DI.
16. Submit dry solids, filtrate and wash for analysis (liquids for U, Fe2+/Fe3+; solids for U)

Health & Safety: Adhere to all SGS SOPs for handling of radioactive material.
Handling of all dry NORM material must be done in the containment booth or NORM Area.
Wear all proper PPE when handling acidic slurry.
Refer to MSDS for H_2SO_4, $NaClO_3$ and ferric sulphate salt.

Conditions:

Wet Feed Weight	498	g
Moisture	0	%
Dry Feed Weight	498.0	g
Water added:	1162.0	mL
Water in Feed	0.0	mL
Pulp Density:	30.0	w/w%
pH	1.2	
Initial Acid Added		g 96% H_2SO_4
Dosage	0.0	g/L H_2SO_4
Dosage	0.0	kg H_2SO_4 / t dry feed
$NaClO_3$ Dosage	0.0	kg / t dry feed
$NaClO_3$ Strength	200.0	g/L
$NaClO_3$ addition		mL **or to maintain 500 mV**
Crush	10	mesh
ORP	500	mV

Assay Requirements:

Kinetic PLS:	Fe2+, Fe, U by ICP
Final PLS	Fe2+, Fe, U, ICP
Final Wash	retain
Final Residue	U by ICP

Fe^{3+} addition	1	g/L
$Fe_2(SO_4)_3$	4.2	g ferric sulphate salt

Notes:

bottle tare with lid:		g
bottle tare without lid:		g
dry feed + bottle + lid:		g
final wt (including bottle and lid)		g

Test Details:

Elapsed Time day	date	Temp (°C)	pH	emf (mV)	Reagents Added H_2SO_4 (g)	$NaClO_3$ (mL)	$Fe_2(SO_4)_3$ (g)	Comments
0	01-Jun-10	27.9	1.21	526	27.4		4.2	start test
1	01-Jun-10	21.5	1.23	454		1.9		sample 1
2	03-Jun-10	22.1	1.63	615	112.1			sample 2
3	04-Jun-10	21.8	0.94	518				sample 3, added 100.2 g 50% (w/w) NaOH
7	08-Jun-10	20.6	1.57	486	58.2			new pH probe, sample 4
14	15-Jun-10	21.0	0.69	481				brand new probes, end test
		22.5		Totals	75.2	1.9	4.2	g, mL, g H_2SO_4 accounting for that neutralized by NaOH
					144.9	0.8	8.4	kg/t
				Final pulp weight			1.0	kg Fe/t

Test: B7

Objective: To conduct a sulphuric acid bottle roll leach test on a uranium ore.
To study the kinetics of uranium dissolution under various heap leach conditions.
144.94678

	Pulp weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Cake Moisture[2] (unwashed residue)		PLS Filtrate			
								pH	emf[1]	sg	Free Acid
Sample	(g)	(g)	(g)	(g)	(g)	(%)	(mL)		(mV)	g/mL	(g/L)
1 d	38	36.6						1.23	454	1.019	28
2 d	50	48.4						1.63	615	1.016	15
3 d	48	44.5						0.94	518	1.074	106
7 d	49	46.0						1.57	486	1.101	44
14 d	51	48.2						0.69	481	1.126	88
Final	1720	1127	627.8	551	479	12%	64.5	0.67	477	1.1255	88

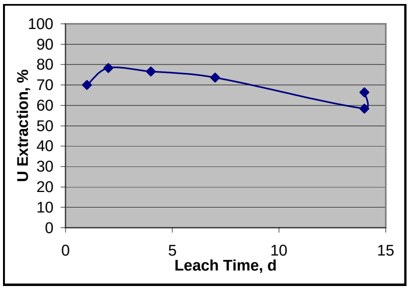
[1] (emf measured against Ag|AgCl sat'd KCl 600 mV buffer)

[2] Assuming s.g. of pore water in washed cake is 1.00.

Metallurgical Balance:

	Amt.	Assays, mg/L or g/t			U Dist'n	U Ext'n
Product	mL, g	Fe	Fe2+	U	%	%
Head	498			130		
1 d PLS	36	1340	290	39	2.28	70.0
2 d PLS	48	1590	<5	45	3.48	78.3
3 d PLS	41	2430	29	46	3.10	76.6
7 d PLS	42	2370	528	46	3.12	73.7
14 d PLS	43	2900	944	38	2.64	58.4
Final PLS	1103	2800	945	39	69.84	66.4
Residue	479			<20	15.55	**>84**
Calc'd Head				124	100.00	
Mass Balance (out/in%)						95.1
Calc'd wt. Loss						4%

Leach Kinetics:



Appendix B – Agitated Leach Details

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 07/19/2010

Test ID: **AL-1**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Overall Comp
Grind: 20.25 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2496.3	g
Wet Feed Weight:	1154.2	g
Moisture:	17%	
Dry Feed Weight:	954.5	g
Target Slurry Density:	50	w/w%
Water added:	754.9	mL
Water in Feed:	199.7	mL
Target FA:	20	g/L H_2SO_4 19 g initial dose
Oxidant Type:	NaClO3	200 g/L
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	55	µm
Temperature:	50	ºC

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	FA (g/L H_2SO_4)	Reagents Added H_2SO_4 (g)	Reagents Added NaClO3 (g)	Comments
11:20	-0.8	21.7	8.58	103		22.40		Add acid, 500 RPM
11:25	-0.8	22.9	1.35	160				Start heating
11:35	-0.6	34.7	1.28	215	8	17.30		5 mL aliquot
11:50	-0.3	50.2	0.76	340				
12:00	-0.2	52.2	0.82	375	18.2	2.60		5 mL aliquot
12:11	0.0	51.1	0.75	386				Start test
12:26	0.3	49.5	0.72	387				
12:41	0.5	50.2	0.75	387				
13:11	1.0	48.8	0.76	386			2.70	Add NaClO3
13:12	1.0	49.0	0.76	405				
13:41	1.5	50.5	0.78	456				
14:11	2.0	51.2	0.82	454	14.75	7.70	2.60	Sample 1
14:24	2.2	51.8	0.66	468				
15:30	3.3	51.3	0.65	500				
16:11	4.0	53.2	0.71	498			2.90	
16:12	4.0	53.2	0.71	502				
18:11	6.0	53.1	0.75	542	15.49	6.30		Sample 2
18:25	6.2	53.3	0.65	544				
0:10	12.0	50.9	0.70	528	18.38	2.50		Sample 3
0:23	12.2	51.2	0.66	528				
12:11	24.0	51.1	0.77	515	15.55			Sample 4, End Test
TWA		52	0.75	517		58.8	8.2	g
						59.1	1.5	kg/t

Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	07/19/2010
Test ID:	**AL-1**		

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

	Pulp Weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Pulp Density	Cake Moisture	PLS Filtrate			
								pH	ORP¹	SG	Free Acid
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	97.6	41.0	120.5	53.5	46.9	48.1%	13	0.82	454	1.031	15
6 hr	96.9	39.4	117	52.3	46.1	47.6%	12	0.75	542	1.039	15
12 hr	98.1	38.5	121	53.3	46.4	47.3%	13	0.66	528	1.045	18
24 hr	98.0	37.9	115.5	55.2	46.7	47.7%	16	1.27	510	1.044	16
Final	1590.8	693.9	1280.1	873.4	741.8	46.6%	16	1.27	510	1.044	16
							TWA:	**1.0**	**515.2**		**16.2**

¹(ORP measured against Ag|AgCl sat'd KCl electrode)

² Assuming SG of pore water in washed cake is 1.00.

Notes: start wash @ 13:45, 14:30, 15:30, 16:10

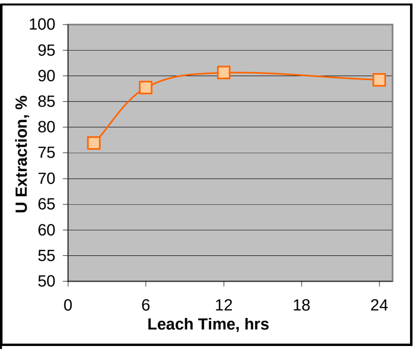
Filtration:

1001-185 Whatman #1 185 mm		enter filter paper type, size	Filtrate Colour:	ylw
12:17 - 12:38	21 min	enter final filtration time (time to no liquid on cake)	Residue Colour:	gry

Metallurgical Balance:

	Amt.	Assays, mg/L or g/t			U Dist'n	U Ext'n
Product	mL, g	Fe	Fe^{2+}	U	%	%
Head	955	1.27		130		
2 h PLS	49	6100	3680	110	4.21	78.3
6 h PLS	49	6000	918	120	4.56	88.2
12 h PLS	49	6900	1410	130	5.01	91.4
24 h PLS	49	7900	1970	120	4.59	89.4
Final PLS	813	7100	1780	110	69.61	88.3
2 h Residue	47			32	1.17	76.9
6 h Residue	46			17	0.61	87.7
12 h Residue	46			13	0.47	90.6
24 h Residue	47			15	0.54	89.2
Final Residue	742			16	9.23	**88.5**
Calc'd Head	928			139	100.00	
Mass Balance (out/in%)						106.6

Leach Kinetics:



Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	07/20/2010
Test ID:	**AL-2**		

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Overall Comp
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2549.2	g	
Wet Feed Weight:	1076.1	g	
Moisture:	12%		
Dry Feed Weight:	948.3	g	
Target Slurry Density:	50	w/w%	
Water added:	820.5	mL	
Water in Feed:	127.8	mL	
Target FA:	20	g/L H_2SO_4	42 g initial dose
Oxidant Type:	NaClO3	200 g/L	
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*	
Fe3+	0	g/L	
Grind	90	µm	
Temperature:	50	ºC	

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	FA (g/L H_2SO_4)	Reagents Added H_2SO_4 (g)	Reagents Added NaClO3 (g)	Comments
13:37	-0.4	25.6	8.45	92		40.70		Add Acid
13:40	-0.4	27.3	1.71	0				Start Heating
14:02	0.0	49.5	0.87	310				Start Test
14:17	0.2	55.8	0.95	379				
14:32	0.5	55.1	0.99	384				
15:02	1.0	51.7	1.01	385			2.80	Add NaClO3
15:03	1.0	51.5	1.01	407				
15:32	1.5	50.2	1.02	475				
16:02	2.0	49.2	1.03	473	14.53	8.80	2.80	Sample 1
16:18	2.3	50.4	0.86	488				
17:02	3.0	48.7	0.82	535				
18:02	4.0	48.6	0.82	531				
20:02	6.0	50.2	0.87	523	17.83	3.20		Sample 2
20:20	6.3	50.3	0.73	525				
2:02	12.0	48.8	0.82	515	17.42	3.50		Sample 3
14:02	24.0	49.2	0.79	510	18			Sample 4, End Test
TWA		50.1	0.84	512		56.2	5.6	g
						56.9	1.1	kg/t

Project No.: **12417-001**
Client: **Uracan**

Project Technologist: M. Archer
Date of Test: 07/20/2010

Test ID: **AL-2**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

	Pulp Weight	**PLS Filtrate**	**Wash Filtrate**	**Wet Residue**	**Dry Residue**	**Pulp Density**	**Cake Moisture**	**PLS Filtrate**			
								pH	ORP[1]	SG	Free Acid
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	97.1	40.1	122.9	53.1	46.1	47.5%	14	1.03	473	1.031	15
6 hr	97.7	40.8	117.6	51.9	46.4	47.5%	11	0.87	523	1.037	18
12 hr	91.9	31.4	116.7	48.8	43.1	46.9%	12	0.82	515	1.042	17
24 hr	94.0	34.3	124.9	52.4	45.3	48.2%	14	1.14	490	1.044	18
Final	1590.3	690.7	1288.9	826.4	749.0	47.1%	10	1.14	490	1.044	18
							TWA:	**1.0**	**500.3**		**17.6**

[1](ORP measured against Ag|AgCl sat'd KCl electrode)
[2] Assuming SG of pore water in washed cake is 1.00.

Notes:

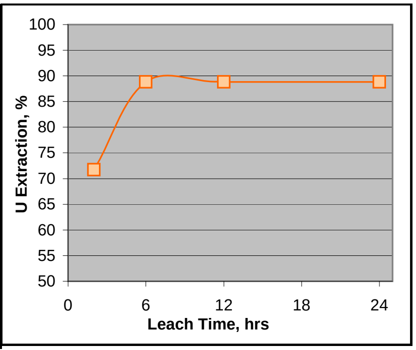
Filtration: 1001-185 Whatman #1 185 mm — enter filter paper type, size
14:10 - 14:53 — 43 min — enter final filtration time (time to no liquid on cake)

Filtrate Colour: ylw
Residue Colour: gry

Metallurgical Balance:

	Amt.	**Assays, mg/L or g/t**			**U Dist'n**	**U Ext'n**
Product	mL, g	Fe	Fe^{2+}	U	%	%
Head	948	1.27		130		
2 h PLS	49	5200	3100	96	3.80	73.1
6 h PLS	49	5900	2030	120	4.74	89.5
12 h PLS	47	6300	2460	110	4.12	88.8
24 h PLS	47	7300	3160	120	4.48	89.2
Final PLS	806	7100	2910	110	70.87	88.8
2 h Residue	46			38	1.40	71.8
6 h Residue	46			15	0.56	88.8
12 h Residue	43			15	0.52	88.8
24 h Residue	45			15	0.54	88.8
Final Residue	749			15	8.98	**88.8**
Calc'd Head	930			135	100.00	
Mass Balance (out/in%)						103.5

Leach Kinetics:



Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	07/20/2010
Test ID:	**AL-3**		

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Overall Comp
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2374.3	g	
Wet Feed Weight:	1138.8	g	
Moisture:	18%		
Dry Feed Weight:	931.7	g	
Target Slurry Density:	50	w/w%	
Water added:	724.7	mL	
Water in Feed:	207.1	mL	
Target FA:	5	g/L H_2SO_4	22 g initial dose
Oxidant Type:	NaClO3	200 g/L	
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*	
Fe3+	0	g/L	
Grind	90	µm	
Temperature:	50	°C	

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	FA (g/L H_2SO_4)	Reagents Added H_2SO_4 (g)	Reagents Added NaClO3 (g)	Comments
13:42	-0.3	24.6	8.24	41		22.30		Add Acid
13:44	-0.3	27.3	1.40	350				Start Heating
14:02	0.0	49.5	1.54	332				Start Test
14:17	0.2	55.1	1.63	342				
14:32	0.5	54.2	1.66	341				
15:02	1.0	50.8	1.68	339			2.60	Add NaClO3
15:04	1.0	50.6	1.68	344				
15:32	1.5	51.9	1.71	425				
16:03	2.0	49.1	1.71	440	3.75	2.70	2.60	Sample 1
16:20	2.3	48.1	1.50	450				
17:02	3.0	53.4	1.55	504				
18:02	4.0	49.9	1.55	512				
20:02	6.0	52.2	1.60	516	4.14	2.40		Sample 2
20:22	6.3	50.1	1.44	518				
2:02	12.0	48.9	1.48	509	5.04	20.00		Sample 3, added too much acid - low acid until 12 hours.
14:03	24.0	50.9	0.84	490	22			Sample 4, End Test
TWA		51.2	1.21	494		47.4	5.2	g
						48.8	1.0	kg/t

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 07/20/2010

Test ID: **AL-3**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

	Pulp Weight	**PLS Filtrate**	**Wash Filtrate**	**Wet Residue**	**Dry Residue**	**Pulp Density**	**Cake Moisture**	**PLS Filtrate**			
								pH	ORP[1]	SG	Free Acid
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	96.9	39.4	112.6	53.8	46.9	48.4%	13	1.71	440	1.014	4
6 hr	97.2	39.0	121.7	52.4	46.8	48.1%	11	1.60	516	1.019	4
12 hr	96.4	35.5	117.6	52.2	44.7	46.4%	15	1.48	509	1.022	5
24 hr	92.4	38.1	116.1	55.2	46.3	50.1%	17	0.93	497	1.044	22
Final	1431.3	737.3	1271.4	837.5	729.9	51.0%	13	0.93	497	1.044	22
							TWA:	**1.2**	**498.4**		**13.4**

[1](ORP measured against Ag|AgCl sat'd KCl electrode)
[2] Assuming SG of pore water in washed cake is 1.00.

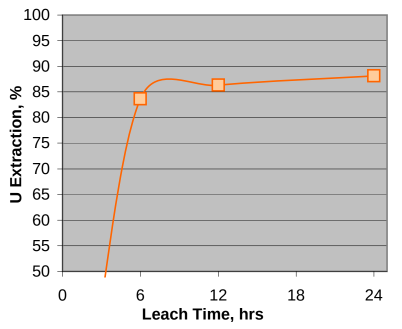
Notes: @12 hours, FA = 5.04 g/L (target = 5 g/L), added enough acid to bring to 20 g/L

Filtration: 1001-185 Whatman #1 185 mm — enter filter paper type, size — Filtrate Colour: ylw
14:18 - 14:51 33 min — enter final filtration time (time to no liquid on cake) — Residue Colour: gry

Metallurgical Balance:

	Amt.	**Assays, mg/L or %**			**U Dist'n**	**U Ext'n**
Product	mL, g	Fe	Fe^{2+}	U	%	%
Head	932	1.27		130		
2 h PLS	49	4100	2200	43	2.11	36.4
6 h PLS	49	4500	860	110	5.41	86.6
12 h PLS	51	4600	1040	110	5.54	89.2
24 h PLS	44	6800	2790	110	4.83	89.0
Final PLS	672	5900	2460	100	66.87	87.6
2 h Residue	47			79	3.69	28.1
6 h Residue	47			18	0.84	83.6
12 h Residue	45			15	0.67	86.3
24 h Residue	46			13	0.60	88.2
Final Residue	730			13	9.44	**88.2**
Calc'd Head	915			110	100.00	
Mass Balance (out/in%)						84.5

Leach Kinetics:



Project No.: **12417-001**
Project Technologist: M. Archer
Client: **Uracan**
Date of Test: 22-Jul-10

Test ID: **AL-4**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Overall Comp
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2374.5	g
Wet Feed Weight:	1119.7	g
Moisture:	16%	
Dry Feed Weight:	941.5	g
Target Slurry Density:	50	w/w%
Water added:	763.3	mL
Water in Feed:	178.2	mL
Target ~~FA~~:	pH 1.8	~~g/L H_2SO_4~~
Oxidant Type:	NaClO3	200 g/L
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	90	µm
Temperature:	50	°C

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time		Temp	pH	ORP	FA	Reagents Added		Comments
						H_2SO_4	NaClO3	
(hh:mm)	(hrs)	(°C)		(mV)	(g/L H_2SO_4)	(g)	(g)	
11:45	-0.4	23.1	8.82	135		22.70		Add Acid
11:49	-0.4	23.6	1.13	30				Start Heating
12:10	0.0	49.5	1.28	150				Start Test
12:25	0.2	59.2	1.56	200				
12:40	0.5	59.5	1.71	252				
13:10	1.0	54.9	1.73	284			3.10	Add NaClO3
13:11	1.0	54.9	1.73	309				
13:40	1.5	50.6	1.67	425				
14:10	2.0	48.8	1.66	435	2.94		2.90	Sample 1
14:13	2.1	48.1	1.65	436				
15:10	3.0	49.4	1.70	477			3.20	
15:11	3.0	49.4	1.70	478				
16:10	4.0	49.0	1.71	521				
18:10	6.0	50.1	1.71	575	0.39			Sample 2
0:10	12.0	50.4	1.71	625	0.196			Sample 3
12:10	24.0	50.4	1.53	635	2			Sample 4, End Test
TWA		51.2	1.64	594		22.7	9.2	g
						23.1	1.7	kg/t

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 22-Jul-10

Test ID: **AL-4**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

	Pulp Weight	**PLS Filtrate**	**Wash Filtrate**	**Wet Residue**	**Dry Residue**	**Pulp Density**	**Cake Moisture**	**PLS Filtrate**			
								pH	ORP[1]	SG	Free Acid
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	97.5	40.1	112.8	52.5	46.8	48.0%	11	1.66	435	1.015	3
6 hr	99.3	41.8	112.8	53.7	48.1	48.4%	11	1.71	478	1.017	0
12 hr	97.6	.9.8	114.5	52.4	44.2	45.3%	16	1.71	625	1.020	0
24 hr	93.4	39.6	114.8	52.9	46.9	50.2%	11	1.48	658	1.012	2
Final	1531.3	676.1	1219.5	892.8	743.0	48.5%	17	1.48	658	1.012	2
							TWA:	**1.6**	**601.2**		**1.3**

[1](ORP measured against Ag|AgCl sat'd KCl electrode)

[2] Assuming SG of pore water in washed cake is 1.00.

Notes: weight taken from LIMS (no tare on sample)
* Samples probably reversed

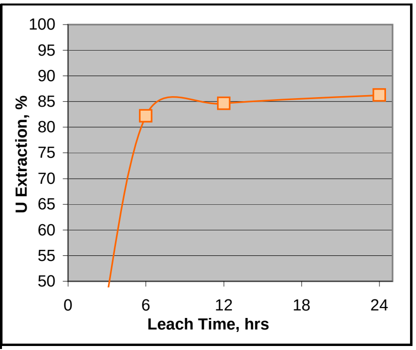
Filtration: 1001-185 Whatman #1 185 mm — enter filter paper type, size
12:18 - 12:27 9 min — enter final filtration time (time to no liquid on cake)

Filtrate Colour: lt orng
Residue Colour: gry

Metallurgical Balance:

	Amt.	**Assays, mg/L or %**			**U Dist'n**	**U Ext'n**
Product	mL, g	Fe	Fe^{2+}	U	%	%
Head	941	1.27		130		
2 h PLS	50	4300	2600	38	1.65	32.8
6 h PLS	50	4500	58	100	4.38	82.6
12 h PLS	52	4500	62	110	5.02	87.3
24 h PLS	46	3300	43	110	4.40	86.4
Final PLS	779	2900	45	100	67.82	86.0
2 h Residue	47			*83**	3.38	32.9
6 h Residue	48			*22**	0.92	82.2
12 h Residue	44			19	0.73	84.6
24 h Residue	47			17	0.69	86.3
Final Residue	743			17	11.00	**86.3**
Calc'd Head	929			124	100.00	
Mass Balance (out/in%)						95.1

Leach Kinetics:



Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	22-Jul-10

Test ID: **AL-5**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Overall Comp
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2549.4	g
Wet Feed Weight:	1187.3	g
Moisture:	19%	
Dry Feed Weight:	962.2	g
Target Slurry Density:	50	w/w%
Water added:	737.4	mL
Water in Feed:	225.1	mL
Target FA:	20	g/L H_2SO_4 50 g initial dose
Oxidant Type:	NaClO3	200 g/L
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	90	µm
Temperature:	75	°C

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	FA (g/L H_2SO_4)	Reagents Added H_2SO_4 (g)	 NaClO3 (g)	Comments
11:45	-0.5	22.1	8.55	112		49.60		Add Acid
11:47	-0.5	28.0	1.03	-50				Start Heating
12:15	0.0	74.5	0.85	358				Start Test
12:30	0.3	75.6	0.91	378				
12:45	0.5	75.4	0.94	382				
13:15	1.0	75.7	0.99	382			2.90	Add NaClO3
13:16	1.0	75.6	0.98	440				
13:45	1.5	74.5	0.99	460				
14:15	2.0	73.6	0.99	456	17.38	4.40	2.80	Sample 1
14:33	2.3	74.5	0.89	482				
15:15	3.0	75.7	0.91	503				
16:15	4.0	76.1	0.94	498			2.90	
16:16	4.0	76.2	0.94	513				
18:15	6.0	75.7	0.97	535	15.49	8.90		Sample 2
18:37	6.4	75.7	0.74	545				
0:15	12.0	75.4	0.83	527	20.318			Sample 3
12:15	24.0	72.3	0.86	515	17			Sample 4, End Test
TWA		75.3	0.89	517		62.9	8.6	g
						62.8	1.6	kg/t

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 22-Jul-10

Test ID: **AL-5**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

	Pulp Weight	**PLS Filtrate**	**Wash Filtrate**	**Wet Residue**	**Dry Residue**	**Pulp Density**	**Cake Moisture**	**PLS Filtrate**			
								pH	ORP[1]	SG	Free Acid
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	98.7	41.6	115	51.8	46.5	47.1%	11	0.99	456	1.041	17
6 hr	94.6	39.2	121.1	49.7	44.0	46.5%	12	0.97	535	1.046	15
12 hr	96.5	33.3	122	52.1	42.8	44.4%	19	0.83	527	1.058	20
24 hr	95.4	34.4	114.4	59.7	48.4	50.7%	20	0.99	517	1.056	17
Final	1535.8	602.5	1288.6	833.3	753.1	49.0%	10	0.99	517	1.056	17
							TWA:	**0.9**	**517.4**		**17.8**

[1](ORP measured against Ag|AgCl sat'd KCl electrode)

[2] Assuming SG of pore water in washed cake is 1.00.

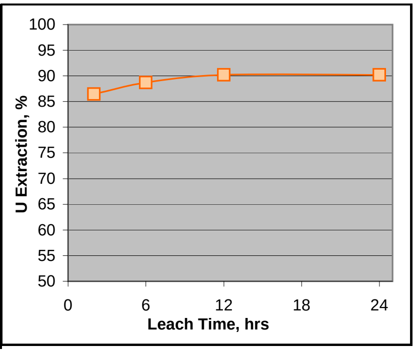
Notes: weight taken from LIMS (no tare on sample)

Filtration: 1001-185 Whatman #1 185 mm enter filter paper type, size Filtrate Colour: ylw
12:25 - 12:57 32 min enter final filtration time (time to no liquid on cake) Residue Colour: gry

Metallurgical Balance:

Product	**Amt.** mL, g	**Assays, mg/L or %** Fe	Fe^{2+}	U	**U Dist'n** %	**U Ext'n** %
Head	962	1.27		130		
2 h PLS	50	6400	4170	110	4.44	86.8
6 h PLS	48	6900	1380	120	4.68	89.8
12 h PLS	51	8300	1930	110	4.50	90.9
24 h PLS	45	9100	2500	130	4.66	90.2
Final PLS	742	8300	2270	120	71.68	90.1
2 h Residue	47			18	0.67	86.4
6 h Residue	44			15	0.53	88.7
12 h Residue	43			13	0.45	90.2
24 h Residue	48			13	0.51	90.2
Final Residue	753			13	7.89	**90.2**
Calc'd Head	935			133	100.00	
Mass Balance (out/in%)						102.2

Leach Kinetics:



Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	09/07/2010

Test ID: **VAL-1**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Comp TJ
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2337.2	g
Wet Feed Weight:	1139.7	g
Moisture:	16%	
Dry Feed Weight:	954.1	g
Target Slurry Density:	50	w/w%
Water added:	768.6	mL
Water in Feed:	185.6	mL
Target FA:	5	g/L H_2SO_4
Oxidant Type:	NaClO3	
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	150	µm
Temperature:	50	ºC

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	FA (g/L H_2SO_4)	Reagents Added H_2SO_4 (g)	Reagents Added NaClO3 (g)	Comments
10:07	-0.4	19.1	8.36	16		27.70		Add Acid
10:10	-0.4	19.4	1.35	275				Start Heating
10:33	0.0	49.5	1.08	342				Start Test
10:48	0.2	54.5	1.27	356				
11:03	0.5	50.3	1.26	357				
11:18	0.8	51.2	1.29	358				
11:33	1.0	53.4	1.32	359			3.00	Add Chlorate
11:34	1.0	54.0	1.33	387				
12:03	1.5	50.2	1.30	473				
12:33	2.0	46.6	1.25	472	7.81		2.60	Sample 1
12:59	2.4	59.7	1.30	476				
13:33	3.0	45.2	1.25	527				
14:33	4.0	51.0	1.40	534				Changed temperature probe, low readings
16:33	6.0	54.4	1.44	540	5.71			Sample 2
22:33	12.0	50.7	1.44	532	5.20			Sample 3
10:33	24.0	50.5	1.45	526	4.12			End Test
TWA		51.7	1.44	524		27.7	5.6	g
						27.9	1.0	kg/t

Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	09/07/2010
Test ID:	**VAL-1**		

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Sample	Pulp Weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Pulp Density	Cake Moisture	PLS Filtrate			
								pH	ORP[1]	SG	Free Acid
	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	99.4	38.4	120	53.8	47.6	47.9%	12	1.25	472	1.023	8
6 hr	100.5	39.9	117.2	54.4	48.4	48.2%	11	1.44	540	1.022	6
12 hr	100.1	40.9	117.1	55.4	48.5	48.5%	13	1.44	532	1.025	5
24 hr	100.6	34.4	117.7	62.2	49.4	49.1%	21	1.51	538	1.024	4
Final	1526.6	503.9	1341.3	960.7	740.9	48.5%	23	1.51	538	1.024	4
							TWA:	**1.5**	**531.3**		**5.0**

[1] (ORP measured against Ag|AgCl sat'd KCl electrode)

[2] Assuming SG of pore water in washed cake is 1.00.

Notes:

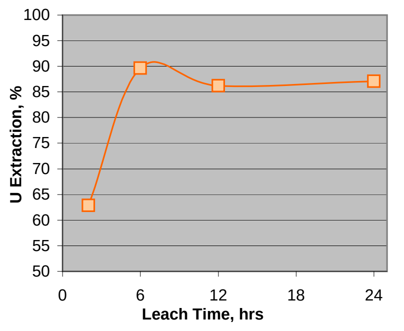
Filtration:

1001-185 Whatman #1 185 mm		enter filter paper type, size	Filtrate Colour:	ylw
10:36 - 10:50	14 min	enter final filtration time (time to no liquid on cake)	Residue Colour:	gry

Metallurgical Balance:

Product	Amt.	Assays, mg/L or %			U Dist'n	U Ext'n
	mL, g	Fe	Fe^{2+}	U	%	%
Head	954	1.12		110		
2 h PLS	51	3680	2110	70	3.27	63.4
6 h PLS	51	3980	671	100	4.71	89.8
12 h PLS	50	4670	732	103	4.79	87.0
24 h PLS	50	4760	850	108	4.99	87.9
Final PLS	767	4540	805	100	70.88	90.4
2 h Residue	48			43	1.89	62.9
6 h Residue	48			12	0.54	89.6
12 h Residue	49			16	0.72	86.2
24 h Residue	49			15	0.68	87.0
Final Residue	741			11	7.53	**90.5**
Calc'd Head	935			116	100.00	
Mass Balance (out/in%)						105.3

Leach Kinetics:



Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	09/07/2010
Test ID:	**VAL-2**		

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Comp SS
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2535.3	g
Wet Feed Weight:	1120.3	g
Moisture:	16%	
Dry Feed Weight:	945.4	g
Target Slurry Density:	50	w/w%
Water added:	770.4	mL
Water in Feed:	174.9	mL
Target FA:	5	g/L H_2SO_4
Oxidant Type:	NaClO3	
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	150	µm
Temperature:	50	ºC

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	FA (g/L H_2SO_4)	Reagents Added H_2SO_4 (g)	Reagents Added NaClO3 (g)	Comments
10:08	-0.3	18.6	8.43	10		27.60		Add Acid
10:13	-0.3	22.3	1.46	-110				Start Heating
10:29	0.0	49.5	1.42	20				Start Test
10:44	0.3	55.0	1.46	92				
10:59	0.5	53.4	1.51	153				
11:14	0.8	50.5	1.53	215				
11:29	1.0	48.7	1.53	245			2.70	Add Chlorate
11:30	1.0	49.4	1.54	278				
11:59	1.5	50.2	1.55	412				
12:29	2.0	50.9	1.58	428	5		2.60	Sample 1
12:58	2.5	51.9	1.61	434				
13:29	3.0	51.4	1.63	479				
14:29	4.0	49.7	1.65	497			2.70	
14:30	4.0	49.6	1.65	498				
16:29	6.0	51.7	1.71	572		4.20		Sample 2
16:43	6.2	51.7	1.44	588				
22:29	12.0	49.1	1.47	642		1.20		Sample 3
22:42	12.2	52.1	1.44	648				
10:29	24.0	50.3	1.54	614				End Test
TWA		50.8	1.56	580		33.0	8	g
						33.5	1.5	kg/t

Project No.: **12417-001**
Client: **Uracan**

Project Technologist: M. Archer
Date of Test: 09/07/2010

Test ID: **VAL-2**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Sample	**Pulp Weight** g	**PLS Filtrate** g	**Wash Filtrate** g	**Wet Residue** (g)	**Dry Residue** (g)	**Pulp Density** w/w	**Cake Moisture** (%)	**PLS Filtrate** pH	ORP[1] (mV)	SG	Free Acid (g/L)
2 hr	92.7	38.0	112.8	50.0	47.2	50.9%	6	1.58	428	1.020	5
6 hr	96.9	39.8	116.2	53.2	47.3	48.8%	11	1.71	572	1.020	2
12 hr	97.3	39.8	118	53.8	47.2	48.5%	13	1.47	642	1.025	5
24 hr	97.0	39.9	116.2	53.1	44.5	45.9%	17	1.47	592	1.024	4
Final	1553.9	669.6	1306.9	878.6	757.2	48.7%	14	1.47	592	1.024	4
							TWA:	**1.5**	**587.5**		**3.9**

[1](ORP measured against Ag|AgCl sat'd KCl electrode)

[2] Assuming SG of pore water in washed cake is 1.00.

Notes:

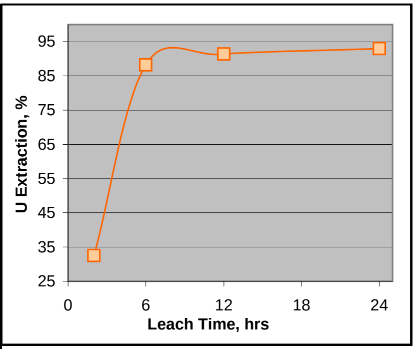
Filtration: 1001-185 Whatman #1 185 mm — enter filter paper type, size
10:32 - 10:43 11 min — enter final filtration time (time to no liquid on cake)

Filtrate Colour: ylw
Residue Colour: gry

Metallurgical Balance:

Product	**Amt.** mL, g	**Assays, mg/L or %** Fe	Fe^{2+}	U	**U Dist'n** %	**U Ext'n** %
Head	945	1.15		120		
2 h PLS	45	3770	2690	29	1.08	24.2
6 h PLS	49	4250	141	107	4.33	88.0
12 h PLS	49	4370	63	116	4.72	91.6
24 h PLS	51	4840	169	117	4.99	93.7
Final PLS	778	4300	165	113	73.20	91.3
2 h Residue	47			86	3.38	32.5
6 h Residue	47			15	0.59	88.2
12 h Residue	47			11	0.43	91.4
24 h Residue	45			9	0.33	92.9
Final Residue	757			11	6.93	**91.4**
Calc'd Head	943			127	100.00	
Mass Balance (out/in%)						106.1

Leach Kinetics:



Project No.:	**12417-001**	**Project Technologist:**	M. Archer
Client:	**Uracan**	**Date of Test:**	08-Sep
Test ID:	**VAL-3**		

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Comp MZ
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2514.3	g
Wet Feed Weight:	1158.3	g
Moisture:	20%	
Dry Feed Weight:	926.2	g
Target Slurry Density:	50	w/w%
Water added:	694.0	mL
Water in Feed:	232.1	mL
Target FA:	5	g/L H_2SO_4
Oxidant Type:	NaClO3	
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	150	µm
Temperature:	50	ºC

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time		Temp	pH	ORP	FA	Reagents Added		Comments
(hh:mm)	(hrs)	(°C)		(mV)	(g/L H_2SO_4)	H_2SO_4 (g)	NaClO3 (g)	
11:33	-0.3	20.9	8.60	131		27.60		Add Acid
11:35	-0.2	24.7	1.36	100				Start Heating
11:49	0.0	49.5	1.28	290				Start Test
12:04	0.3	55.6	1.29	346				
12:19	0.5	53.7	1.30	342				
12:34	0.8	52.5	1.30	339				
12:49	1.0	51.0	1.30	337			3.00	Add Chlorate
12:50	1.0	50.9	1.30	352				
13:19	1.5	50.0	1.30	441				
13:49	2.0	49.1	1.31	445	8.79		2.60	Sample 1
14:03	2.2	49.4	1.31	447				
14:49	3.0	49.5	1.34	495			2.50	
14:50	3.0	49.4	1.34	496				
15:49	4.0	50.2	1.37	562				
17:49	6.0	50.0	1.41	601	5.45			Sample 2
23:49	12.0	50.5	1.49	625	4.14	1.40		Sample 3
0:01	12.2	50.9	1.41	629				
11:49	24.0	49.6	1.49	613	3.75			End Test
TWA		50.5	1.47	592		29.0	8.1	g
						30.1	1.6	kg/t

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 08-Sep

Test ID: **VAL-3**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Sample	Pulp Weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Pulp Density	Cake Moisture	PLS Filtrate			
								pH	ORP¹	SG	Free Acid
	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr	97.6	40.2	116.8	53.3	48.1	49.3%	10	1.31	445	1.026	9
6 hr	97.4	40.0	116.9	54.8	47.3	48.6%	14	1.41	601	1.025	5
12 hr	99.2	40.2	122.3	55.5	48.3	48.7%	13	1.49	625	1.028	4
24 hr	96.6	39.5	116.6	53.5	47.1	48.8%	12	1.43	612	1.025	4
Final	1531.2	639.5	1274.6	863.2	744.1	48.6%	14	1.43	612	1.025	4
							TWA:	**1.4**	**599.5**		**4.6**

¹(ORP measured against Ag|AgCl sat'd KCl electrode)
² Assuming SG of pore water in washed cake is 1.00.

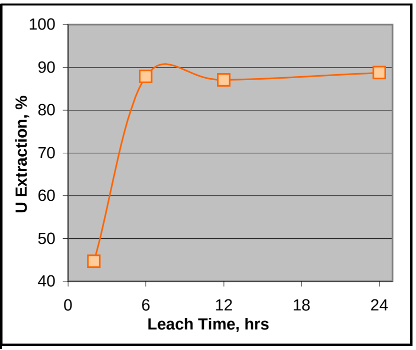
Notes:

Filtration: 1001-185 Whatman #1 185 mm — enter filter paper type, size — Filtrate Colour: ylw
11:54 - 12:06 12 min — enter final filtration time (time to no liquid on cake) — Residue Colour: gry

Metallurgical Balance:

Product	Amt.	Assays, mg/L or %			U Dist'n	U Ext'n
	mL, g	Fe	Fe^{2+}	U	%	%
Head	926	1.69		100		
2 h PLS	48	3910	2250	36	1.61	36.1
6 h PLS	49	4150	34	97	4.38	87.7
12 h PLS	50	4330	38	103	4.72	87.6
24 h PLS	48	4600	73	106	4.73	89.3
Final PLS	768	4420	70	97	68.85	86.2
2 h Residue	48			64	2.85	44.7
6 h Residue	47			14	0.61	87.9
12 h Residue	48			15	0.67	87.0
24 h Residue	47			13	0.57	88.8
Final Residue	744			16	11.01	**86.2**
Calc'd Head	935			116	100.00	
Mass Balance (out/in%)						115.7

Leach Kinetics:



Project No.: **12417-001**
Client: **Uracan**
Project Technologist: [redacted]
Date of Test:

Test ID: **AL-2**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

Feed: Overall Comp
Grind: 15.5 min 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Sulfuric Acid, Sodium Chlorate, NORM Material

Procedure:

1. The sample was ground to the desired P80 and the mill discharge pan filtered
2. A small sample was cut for %H2O determination (~50 g)
3. The wet wt. of feed was recorded along with the kettle tare weight, the solids were slurried and the kettle agitated
4. The Slurry was brought to desired temperature (if required)
5. The pH or FA was adjusted to target level with H_2SO_4; all acid additions were recorded (beware of foaming, add acid slowly)
6. Small amounts of NaClO3 were added to achieve ORP target
7. Records of pH, emf, Temp were kept throughout the test, H_2SO_4 was added to keep constant pH (with acid requirement recorded)
8. The reactor contents were sampled at 2, 6, 12, 24 hrs using 60 mL syringe
9. The pulp sample weight was recorded, then filtered
10. Solids were washed with 60 mL pH 2.0 water, then 60 mL DI water (DO NOT LET CAKE CRACK or repulp)
11. The filtrate weight and SG were recorded, along w/ pH, FA and ORP if sufficient volume permitted
12. Dry solids and filtrate were submitted for analysis, the wash solution was rejected
13. After completion of the test the reactor was allowed to cool (if at T) and agitation was stopped
14. The final weight of vessel was recorded and the contents filtered and washed once with 300 mL pH 2.0 water, 3 times with 300 mL DI
15. The filtration rate was recorded along with notes on residue and liquor colour
16. The filtrate weight and SG were recorded, along w/ pH, FA and ORP
17. Dry solids and filtrate were submitted for analysis, the wash solution was rejected

All pulp samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions:

Reactor Tare (incl. lid and baffles):	2462.3	g
Wet Feed Weight:	1167.6	g
Moisture:	19%	
Dry Feed Weight:	945.8	g
Target Slurry Density:	50	w/w%
Water added:	724.1	mL
Water in Feed:	221.8	mL
Target FA:	20	g/L H_2SO_4
Oxidant Type:	NaClO3	
Target ORP:	500 - 550	mV *(vs. Ag|AgCl sat'd KCl electrode)*
Fe3+	0	g/L
Grind	150	µm
Temperature:	50	ºC

Analytical Requirements:

Kinetic solutions	U, Fe, Fe2+
Kinetic residues	U
Final PLS	U, Fe2+, ICP
Final residue	U

Test Details:

Elapsed Time (hh:mm)	**(hrs)**	**Temp (°C)**	**pH**	**ORP (mV)**	**FA (g/L H_2SO_4)**	**Reagents Added H_2SO_4 (g)**	**Reagents Added NaClO3 (g)**	**Comments**
7:52		18.5	8.12	2		56.40		
7:55		26.1	1.09	-250				
8:11	0.0	49.5	0.80	250				
9:11	1.0	51.9	0.81	404			2.40	
9:15		51.9	0.81	428				
10:11	2.0	50.6	0.82	491			2.80	
10:12		50.4	0.81	500				
8:15		50.3	0.97	511				
TWA						56.4	5.2	g
						57.2	1.0	kg/t

Project No.:	**12417-001**	**Project Technologist:**	
Client:	**Uracan**	**Date of Test:**	

Test ID: **AL-2**

Objective: To conduct a sulphuric acid leach test on a uranium ore
To study the kinetics of uranium dissolution under various conditions

	Pulp Weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Pulp Density	Cake Moisture	PLS Filtrate			
								pH	ORP¹	SG	Free Acid
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		(g/L)
2 hr						~~#DIV/0!~~	~~#DIV/0!~~				
6 hr						~~#DIV/0!~~	~~#DIV/0!~~				
12 hr						~~#DIV/0!~~	~~#DIV/0!~~				
24 hr	102.6	42.4	121.9	53.4	47.0	45.8%	13	1.09	524	1.051	19
Final	1731.03	805.3	1275.6		793.0	45.8%	2053	1.09	524	1.051	19
							TWA:				

¹(ORP measured against Ag|AgCl sat'd KCl electrode)
² Assuming SG of pore water in washed cake is 1.00.

Notes:

Filtration: 1001-185 Whatman #1 185 mm — enter filter paper type, size — Filtrate Colour: ylw
8:21 - 8:37 16 min — enter final filtration time (time to no liquid on cake) — Residue Colour: gry

Metallurgical Balance:

	Amt.	Assays, mg/L or %				U Dist'n	U Ext'n	Th Ext'n
Product	mL, g	Fe	Fe^{2+}	Th	U	%	%	
Head	946	1.27		100	130			
24 h PLS	53	6400			130	5.16	100.0	
Final PLS	892	6400	0	59.3	130	87.10	91.8	
24 h Residue	47					0.00	100.0	
Final Residue	793			33	13	7.74	**91.8**	**66.9**
Calc'd Head	840			100	159	100.00		
Mass Balance (out/in%)							122.0	

Appendix C – SX/IX Test Details

Project No. **12417-001** **Project Technologist:**
Client: **Uracan** **Date of Test:**

Test: **UEX-1**

Note: can use pre-prepared organic if can find 2.5% Alamine

Extractant Preparation

1. Prepare 2 L of the organic mixture (2.5% Alamine336 + 2.5% isodecanol in Exxsol D80). Alamine336 is in storage in black jerry cans or newer 4 L jugs from Cognis
2. Measure out the extractant first in a cylinder of appropriate size. Measure out the isodecanol in another cylinder. Measure out the Isopar needed in a third cylinder. Pour the Alamine into the mixing vessel. Rinse the Alamine measuring cylinder with some of the Isopar that you have measured out. This will wash the viscous Alamine out the measuring cylinder. Do the same with the isodecanol. Finally add the remaining amount of the pre-measured Isopar to the mixing beaker and mix well.
3. Prepare 2000 mL of 50 g/L H_2SO_4 in DI water and 1000 mL of pH 4 DI water (acidified with H_2SO_4).
4. Contact the organic and the 50 g/L at O/A = 2/1 in a separatory funnel for 3 min, ambient temperature. Allow the phases to separate as completely as possible, or for 4 h, whichever is shorter, then make the second contact in the same day with fresh 50 g/L solution. Drain off the aqueous after separation.
5. Contact the organic and the pH 4 DI water in the separatory funnel for 3 min, ambient temperature. Allow the phases to separate overnight in a relatively warm place. After separation, drain off the aqueous and record the aqueous pH. This aqueous and the 50 g/L aqueous can be discarded.

Extraction Contacts

1. Carry out the extraction contacts at the indicated volumes. Shake in a separatory funnel for 4 min.
2. Allow the phases to fully separate.
3. Record approximate times (sec) for initial and complete phase separation. Record the temperature in the separatory funnel. Measure the volume of each separated phase using the smallest cylinder that will contain the solution (for maximum accuracy). Record the equilibrium pH. Record phase colours and clarities for the separated phases. You may need to leave phases overnight for good separation.
4. Filter a sample of ~50 mL of separated aqueous through Whatman No 1 or 3 paper to remove any fine organic droplets. Filter a sample of ~50 mL of separated organic through Whatman No 1ps paper to remove any entrained aqueous droplets.
5. Submit aqueous feeds, raffinates and organic for U, and Fe.

Project No. 12417-001
Client: Uracan

Project Technologist: M. Archer
Date of Test: 20-Oct-10

Test No. **UEX-1**

Objective: Uranium extraction isotherm using Alamine 336

Procedure: See Procedure sheet.

Reactants:

Aqueous Feed
12417-001 Combined PLS from Overall Comp Leaches

Organic Feed
2.5 $^v/_o$ Alamine 336, 2.5$^v/_o$ isodecanol in Exxsol D80

Conditions:

Mixer:
Impeller: hand shaken
Contact Time: 4 minutes
Phase Ratio: various

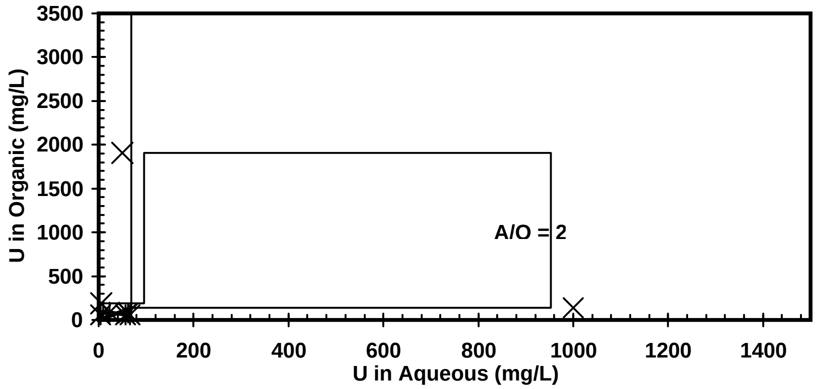
Phase Continuity: not controlled
Temperature: ambient (20 ºC)
Atmosphere: air
Equilibrium pH: not controlled

O/A Ratio			**Feed**	**1/20**	**1/10**	**1/5**	**1/2**	**1/1**
Temperature, ºC								
Equilibrium pH								
Organic IN		mL		20	20	30	50	100
Organic OUT		mL		~10	16	27	49	100
Aqueous IN		mL		400	200	150	100	100
Aqueous OUT (equil)		mL		388	193	134	99	99
Initial Disengagement²		sec		15	60	8	7	13
Final Disengagement		sec		240	240	975	83	109
Emulsion		mm		4	2	1	1	0
Crud				O	O	O	--	--
Phases	Aqueous	colour	green	grn	grn	grn	grn	grn
		clarity	clear	clr	clr	clr	clr	clr
	Organic	colour	grn	ylw	ylw	ylw	ylw	ylw
		clarity	clr	cloudy	clr	clr	clr	cloudy
Sample ID			EF	1	2	3	4	5
Uranium	Organic	mg/L	0	<100	<100	100	<100	<100
	Calc'd Org.	mg/L	0	60	80	60	90	60
	Aqueous	mg/L	69	66	61	56	23	4
	Loaded	%		4	11	18	67	94
	Distribution Coeff. (O/A)			1	1	1	4	14
	Calc. Aq. In			69	69	74	72	104
Iron	Organic	mg/L	0	15	<10	<10	<10	<10
	Aqueous	mg/L	4000	3330	3280	3330	3300	3300
	Loaded	%		19	21	26	18	18
	Distribution Coeff. (O/A)			0.00	<0.00	<0.00	<0.00	<0.00
	Calc. Aq. In	mg/L		3231	3166	2977	3272	3277

Colour Key
grn = green
yel = yellow
slt = slight

² times are for initial break and complete separation of one phase

U Extraction Isotherm



Project No. 12417-001 **Project Technologist:** M. Archer
Client: Uracan **Date of Test:** 26-Oct-10

Test No. **UIX-1**

Objective: Uranium extraction isotherm using Purolite A660 resin.

Procedure: See Procedure sheet.

Reactants:

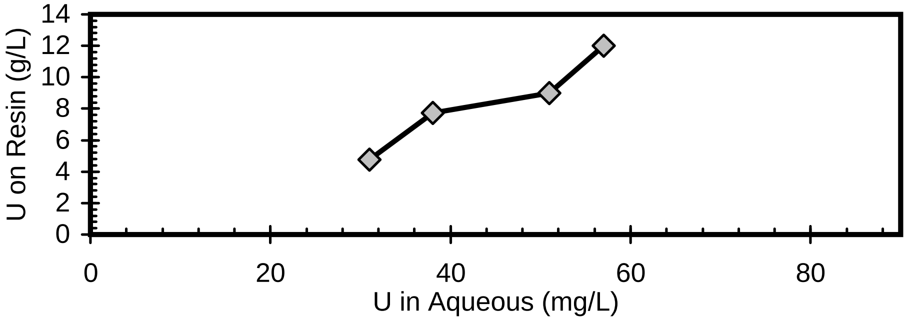
Aqueous Feed	Resin
12417-001 Combined PLS from Overall Comp Leaches	Preconditioned A660 SBA Resin

Conditions:

Mixer:	bottle roll	Phase Continuity:	N/A
Impeller:	N/A	Temperature:	ambient (20 ºC)
Contact Time:	24 h	Atmosphere:	air
Phase Ratio:	various	Equilibrium pH:	not controlled
Sampling:	24 h aq - U resins - U		

mL/L			Feed	1.0	2.0	4.0	8.0
Temperature, ºC				ambient			
Equilibrium pH				not controlled (aq. ~1.8)			
wsr Resin IN		mL		2	2	2	4
Resin OUT		mL		2	2	2	4
Resin OUT		g		0.8	0.8	0.9	1.7
Aqueous IN		mL		2000	1000	500	500
Aqueous OUT (equil)		mL		1960	1000	505	502
Phases	Aqueous	colour	green	grn	grn	grn	grn
		clarity	clear	clr	clr	clr	clr
	Resin	colour	orn	orn	orn	orn	orn
		clarity					
Uranium	Resin	mg/L		NSS	NSS	NSS	NSS
	Calc'd Resin	mg/L		12000	9000	7750	4750
	Aqueous	mg/L	69	57	51	38	31
	Loaded	%		17	26	45	55
	Distribution Coeff. (R/A)			211	176	204	153
	Calc. Aq. In			68	69	69	68

U Extraction Isotherm



Project No. 12417-001
Client: Uracan

Project Technologist: M. Archer
Date of Test: 26-Oct-10

Test No. **UIX-1**

Objective: Uranium extraction isotherm using Purolite A660 resin.

Procedure: See Procedure sheet.

Reactants:

Aqueous Feed	Resin
12417-001 Combined PLS from Overall Comp Leaches	Preconditioned A660 SBA Resin

Conditions:

Mixer: bottle roll
Impeller: N/A
Contact Time: 24 h
Phase Ratio: various
Sampling: 24 h aq - U
resins - U

Phase Continuity: N/A
Temperature: ambient (20 ºC)
Atmosphere: air
Equilibrium pH: not controlled

U in Aqueous (mg/L)

Appendix D – Neutralization Details

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 18-Nov

Test ID: **Neut 1**

Objective: To conduct a neutralization test on leach residue and IX Barren Solution

Feed: "Bulk" Leach Residue and Barren IX Solution
Grind: N/A 50% solids in lab ball mill
(note time/kg, weight charged, % solids in mill and mill size/type)

MSDS for Review: Dilute Sulphuric Acid, Barium Chloride, Limestone, Hydrated Lime, NORM Solids

Procedure:

1. The % moisture was determined from the "Bulk" Leach Reside sample taken for assay.
2. The slurry was brought to the required % solids by weighing wet residue and adding the barren solution
3. Barium Chloride was added as a 10 g/L solution to obtain approximately 250 mg/L BaCl2 in the reaction solution.
4. The slurry pH was adjusted to pH 5.5 over one hour at room temperature using 30% limestone slurry. Additions were recorded.
5. A solution sample was obtained to be assayed for U, Fe, and As.
6. The slurry pH was adjusted to pH 10 using 20% hydrated lime slurry. pH was maintained about pH 9 for two hours.
7. A solution sample was obtained to be assayed for Hg, ICP-MS (low detection), and Ra226.
8. The reaction slurry was filtered and the residue was washed and dried. The final residue was submitted for SG, ICP-MS, NAG, and ABA.

All samples must be labeled "NORM" for Naturally Occurring Radioactive Material

Conditions: ***Analytical Requirements:*** See Instructions

Reactor Tare (incl. lid and baffles):	2553.6	g
Wet Feed Weight:	1013.0	g
Moisture:	13%	
Dry Feed Weight:	886.4	g
Target Slurry Density:	30	w/w%
Barren added:	1957.6	mL
Water in Feed:	126.6	mL
Target $BaCl_2$:	250	mg/L
10 g/L $BaCl_2$ addition:	52.00	mL
LS Slurry pH Target:	5.5	over one hour
Lime Slurry pH Target:	9-10	hold for two hours
Temperature:	RT	ºC

Test Details:

Elapsed Time (hh:mm)	(hrs)	Temp (°C)	pH	ORP (mV)	Reagents Added $BaCl_2$ (mL)	LS Slurry (g)	Lime Slurry (g)	Comments
13:00	0.0	16.8	1.35	724	52			
13:02	0.0	16.8	1.30	725		130.80		
13:17	0.3	18.1	3.02	645		72.50		
13:32	0.5	18.1	4.11	428		36.70		
13:47	0.8	18.1	5.61	80			73.40	
13:52	0.0	19.1	9.77	-144				
13:56	0.1	19.3	8.93	-105			14.70	
13:59	0.1	19.4	9.79	-140				
14:14	0.4	19.6	8.99	-89			8.60	
14:16	0.4	19.7	10.14	-147				
15:52	2.0	19.9	9.45	-99				
TWA					52.0	240.0	96.7	mL or g
					249.5	81.2	21.8	mg/L or kg/t

Project No.: **12417-001** **Project Technologist:** M. Archer
Client: **Uracan** **Date of Test:** 18-Nov

Test ID: **Neut 1**

Objective: To conduct a neutralization test on leach residue and IX Barren Solution

	Pulp Weight	PLS Filtrate	Wash Filtrate	Wet Residue	Dry Residue	Pulp Density	Cake Moisture	PLS Filtrate			
								pH	ORP¹	SG	
Sample	g	g	g	(g)	(g)	w/w	(%)		(mV)		
pH 5.5	74.2	41.9				0.0%	#DIV/0!	5.61	80	1.050	
pH 10	3247.9	1804.1	1188.8	1198.5	991.3	30.5%	17	8.73	189	1.000	
							TWA:				

¹(ORP measured against Ag|AgCl sat'd KCl electrode)
² Assuming SG of pore water in washed cake is 1.00.

Notes: pH 5.5 Sample - spilled 17.5 g, saved 24.4 g SG Estimated

Filtration:
#3 185 mm enter filter paper type, size Filtrate Colour: clr
15:56 - 16:02 6 min enter final filtration time (time to no liquid on cake) Residue Colour: brn

Metallurgical Balance:

	Amt.	Assays, mg/L or g/t				
Product	mL, g	Fe	Fe^{2+}	U	As	Hg
Head Solids	886			13		
Barren Solution	2084			2		
pH 5.5	71	2.8		0.5	<0.3	
pH 10 PLS	2257	<0.2		0.01	<0.3	0.0001
pH 10 Residue	991	12000		9.5	<10	
Calc'd Head	991			9.6		
Mass Balance (out/in%)						

CERTIFICATE OF AUTHOR

To accompany the report entitled: Uracan North Shore Property Double S Zone Technical Report, Quebec, Canada, dated August 15, 2011

I, Jean-François Couture, residing at 59 Tiverton Avenue in Toronto, Ontario do hereby certify that:

1) I am a Principal Geologist with the firm of SRK Consulting (Canada) Inc. with an office at Suite 2100, 25 Adelaide Street East Toronto, Ontario, Canada;
2) I am a graduate of the Université Laval in Quebec City with a BSc. in Geology in 1982. I obtained an MSc.A. in Earth Sciences and a Ph.D. in Mineral Resources from Université du Québec à Chicoutimi in 1986 and 1994, respectively. I have practiced my profession continuously since 1982. From 1982 to 1988, I conducted regional mapping programs in the Precambrian Shield of Canada, from 1988 to 1996, I conduced mineral deposit studies for a variety of base and precious metals deposits of hydrothermal and magmatic origins. From 1996 to 2000, I was a Senior Exploration Geologist responsible for the development, execution and management of exploration program for base and precious metals in Precambrian terranes, including volcanogenic sulphide deposits. Since 2001 I am a Principal Geologist and have authored and co-authored several independent technical reports on several base and precious metals exploration and mining projects in Canada, United States, China, Kazakhstan, Mexico, Northern Europe, South America, West Africa and South Africa;
3) I am a Professional Geoscientist registered with the Ordre des Géologues du Québec (OGQ#1106) and the Association of Professional Geoscientists of the province of Ontario (APGO#0197);
4) I have personally inspected the subject property on February 25, 2010;
5) I have read the definition of “qualified person” set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of National Instrument 43-101 and that this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1 guidelines;
6) I am a co-author of this technical report and have conducted the site visit and reviewed all sections of this technical report. I accept professional responsibility for this technical report except sections 13, 15, 16, 18 and 19;
7) I am, as a qualified person, independent of the issuer as defined in Section 1.4 of National Instrument 43-101;
8) SRK Consulting (Canada) Inc. was retained by Uracan Resources Ltd. to prepare a technical report for the North Shore Property in accordance with National Instrument 43-101 and Form 43-101F1 guidelines. The preceding report is based on a site visit, our review of project files and discussions with Uracan Resources Ltd. personnel;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
10) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the North Shore Property or securities of Uracan Resources Ltd.;
11) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading;
12) I consent to the filing of the technical report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the technical report; and

Toronto, Canada

August 15, 2011

Jean-François Couture, Ph.D, P.Geo.

Principal Geologist

CERTIFICATE OF AUTHOR

To accompany the report entitled: Uracan North Shore Property Double S Zone Technical Report, Quebec, Canada, dated August 15, 2011

I, Marek Nowak, residing at 4064 Toronto St., Port Coquitlam, BC do hereby certify that:

1) I am a Principal Geostatistician with the firm of SRK Consulting (Canada) Inc. with an office at 22nd Floor 1066 West Hastings Street Vancouver, BC Canada;

2) I am a graduate of the of the University of Mining and Metallurgy, Cracow, Poland with a Master of Science degree in mining engineering in 1979. In 1991 I obtained a Master of Science degree in geostatistics from the University of British Columbia, Vancouver. I have over 25 years of experience in the mining industry, as a mining engineer (in Poland), geologist and geostatistician (in Canada). I specialize in natural resource evaluation and risk assessment using a variety of geostatistical techniques. I have co-authored several independent technical reports on base and precious metals exploration and mining projects in Canada, and United States;

3) I am a Professional Engineer registered with The Association of Professional Engineers and Geoscientists of the Province of British Columbia, Canada, Reg. No. 16985;

4) I have not visited the subject property and relied on the site visit completed by Jean-François Couture, a co-author of this technical report;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;

6) I am, as a qualified person, independent of the issuer as defined in Section 1.4 of National Instrument 43-101;

7) I am a co-author of this technical report and accept professional responsibility for sections 13, 15, 16, 18, and 19;

8) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;

9) SRK Consulting (Canada) Inc. was retained by Uracan Resources Ltd. to prepare a technical report for the Doube S Zone in accordance with NI 43-101 and Form 43-101F1 guidelines. The preceding report is based on a site visit, our review of project files and discussions with Uracan personnel;

10) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the North Shore Project or securities of Uracan Resources Ltd;

11) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading;

12) I consent to the filing of the technical report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the technical report.

Vancouver, Canada
August 15, 2011

Marek Nowak, P.Eng
Principal Geostatistician