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26 February 2012

Mr. Keith McConnell, Deputy Director
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management
U.S. Nuclear Regulatory Commission
11545 Rockville Pike, Mail Stop T7-E18
Rockville, MD 20852

Dear Mr. McConnell:

SUBJECT: Sweetwater Uranium Project – Docket Number 40-8584
Source Material License No. SUA-1350
Annual ALARA Audit

Enclosed is Kennecott Uranium Company's Annual ALARA Audit. This audit addresses conditions 9.3D and 12.3 of Source Material License number SUA-1350.

If you or your staff have any questions or require further information, please contact me at (307) 328-1476.

Sincerely,

Oscar A Paulson
Oscar A. Paulson
Facility Supervisor

cc: James Webb, Project Manager (NRC) (2)
Director, DNMS (NRC) - Arlington, TX (w/o attachments)
Rich Atkinson

Rio Tinto

Internal memo

26 February 2012

To: NRC File

Subject: Sweetwater Uranium Project – Source Materials License SUA-1350: In-House Review of the Radiation Safety Program Including Audits, Inspections, Employee Exposures, Effluent Releases and Environmental Data as Required by License Condition 12.3

As required by License Condition 12.3 of SML #SUA-1350, the radiation safety, health physics and environmental monitoring programs are reviewed herein. In addition, trends in exposure, possible reductions in exposure or effluents under the ALARA concept and the use, maintenance and inspection of radiation monitoring equipment is discussed. The required (License Conditions 9.3 and 12.3) report on the activities of the Safety and Environmental Review Panel (SERP) is also attached.

Attached as part of this review process are the following:

- Summary of Monthly Radiation Safety Meetings
- Summary of Annual Radiation Refresher Training
- Occupational Exposure Assessment - Suspended Operations
- Bioassay Assessment
- Summary of Radiation Instrument Calibrations
- External Gamma Radiation Survey Assessment
- Total and Removable Alpha Radiation Survey Assessment
- Radon Daughter Monitoring Assessment
- Potable Water Quality Summary
- Safety and Environmental Review Panel (SERP)
- Respiratory Protection
- Releases for Unrestricted Use
- Review of Standard Operating Procedures
- Radiation Work Permits
- Dose Assessment/Determination of No Requirement for Individual Monitoring or Dose Calculation at the Sweetwater Uranium Project for 2011
- Discussion of other Items (Fire Protection, etc.).

Review of the Programs

A review of the program revealed the following item(s) which required additional attention or correction during the year:

1. Storage of Contaminated Equipment and Ion Exchange Resin on Site

Contaminated equipment now belonging to the Green Mountain Mining Venture (GMMV), but originally stored on site in 1997 by U.S. Energy Corp/Yellowstone Fuels, Inc., continues to be stored on site. The equipment is stored in the Mill Building, Solvent Extraction (SX) Building, in the tailings impoundment, in a designated restricted area within the Main Shop (the Welding Bay). Ownership of this equipment was transferred to the Green Mountain Mining Venture (GMMV) by U.S. Energy Corp/Yellowstone Fuels, Inc., on September 11, 2000.

In addition, approximately 174,740 pounds of an ion exchange resin/water mixture is stored on site in the Number 1 Counter Current Decantation (CCD) thickener tank in the Mill Building. This material now belongs to the Green Mountain Mining Venture (GMMV), but was originally stored on site by U.S. Energy Corp/Yellowstone Fuels, Inc. This material was unloaded on site between April 22 and May 7, 1998.

This material is stored submerged in the Number 1 CCD tank in the mill, which is heated to prevent freezing in the winter. Ownership of this ion exchange resin was transferred to the Green Mountain Mining Venture (GMMV) by U.S. Energy Corp/Yellowstone Fuels, Inc. on September 11, 2000.

Additional radon monitoring was performed using the modified Kusnetz method during unloading and RadTrak radon monitors are placed on top and below the CCD thickener (used to store the resin) and are changed quarterly. Air sample filters are collected semiannually near the Number 1 Counter Current Decantation (CCD) thickener tank and analyzed using the modified Kusnetz method. This is done to determine if handling or storing the resin creates elevated radon levels in the area. The results of the monitoring show that the radon levels in the storage area remain at background in spite of resin being stored there.

The stored equipment may have been responsible for previously elevated radon daughter concentrations measured in the Solvent Extraction (SX) Building. This situation has been corrected by operating an exhaust fan to remove accumulated radon and radon daughters since December 11, 2001. Radon daughter monitoring using the modified Kusnetz method has been performed semiannually in this area. The monitoring shows radon daughter concentrations ranging from 0.012 WL to 0.026 WL.

Changes in the Program

Additional Continuous Radon Monitoring
Continuous RadTrak radon monitors are placed on top and at the base of the Number 1 CCD Thickener and changed on a quarterly basis to monitor radon levels in the area to determine if the storage of resin in the thickener increased radon levels in the Mill Building. Radon levels in the Mill Building remain at background levels.

Additional Airborne Particulate monitoring in the Mill and Solvent Extraction (SX) Buildings
Eleven (11) additional high volume air samples were collected in the Mill and SX Buildings in an attempt to determine the cause of the elevated natural uranium concentrations in the breathing zone sample collected on Tuesday, August 23, 2011. All of these additional samples showed airborne particulate radionuclide concentrations to be low, casting doubt on the validity of the Tuesday, August 23, 2011 breathing zone sample result.

Trends in Exposure
Operations were suspended in April 1983. Operations have remained suspended since that time. Exposures are low. Individual monitoring of personnel is not required since all exposures are below 10% of the allowable limit. In-plant air samples are collected semiannually. Work performed in the mill and tailings impoundment has been under Standard Operating Procedures (SOPs). The only activities conducted in 2011 were property security, preservation, maintenance, operation of the tailings impoundment and Catchment Basin pumpback system, environmental monitoring, storage of equipment and used ion exchange resin, liner repair and land farming of petroleum contaminated soils.

Storage of some of the equipment, notably some steel pressure vessels in the mill, has caused gamma radiation levels to increase slightly in the area within the mill in which they are stored. An exhaust fan is operated in the SX building continuously to vent any accumulated radon and radon progeny. Radon daughter concentrations in this area varied between 0.012 WL to 0.026 WL.

Gamma exposures in the tailings impoundment have been reduced by the addition of the material excavated from the Catchment Basin area. This material has a lower radium-226 concentration than the tailings and acts as shielding attenuation gamma radiation from the tailings. The average gamma exposure rate in the impoundment is 103.5 µR/hr (80.6 µR/hr above background).

A single breathing zone sample collected on Tuesday, August 23, 2011 had elevated levels of natural uranium (4.81 E-12 µCi/ml) and Thorium-230 (5.46 E-13 µCi/ml). These results were confirmed by the laboratory. This single sample increased calculated internal doses for the facility. It is unclear why these measured concentrations were so high. Upon receipt and confirmation of these results eleven (11) additional high volume air samples were collected in the Mill and Solvent Extraction buildings in an attempt to determine the cause of the elevated breathing zone sample. The results are documented in this report. It was not possible to question the employee regarding these results since he failed to report for work on Monday, August 29, 2011 and the contract employment agency was unable to locate him. None of the concentrations measured via the high volume air samples even approached the concentrations measured by the breathing zone sample. Four (4) additional breathing zone samples were collected from another Mill Laborer (Mill Laborer-2) in November and December 2011 and none approached the concentrations reported for the Tuesday, August 23, 2011 breathing zone sample from Mill Laborer-1.

Possible Reduction of Personnel Exposures or of Effluents under ALARA
With operations suspended since April 1983, there have been no releases of effluents or employee exposures. The mill, with the exception of the dryer, and yellowcake area has been decontaminated. The dryer is locked and entry is restricted. The yellowcake (precipitation) area has been externally cleaned and the tanks are covered. All thirteen (13) nuclear density gauges in the mill are shuttered and are inventoried semiannually. The gauges were inventoried on June 15 and December 21, 2011. The gauges were leak tested on May 24, 2007.

No leakage was detected. An amendment dated April 9, 1998 was obtained to the nuclear density gauge license, which freed the licensee from testing the on-off mechanism on the thirteen (13) nuclear density gauges in the mill as long as operations remain suspended. This change has caused some reduction in personnel exposure in that personnel now spend less time near the gauges and personnel are not exposed to yellowcake dust associated with testing the on-off mechanism of the gauge in the yellowcake barreling area. A Corrective Action Program (CAP) is in place to address the seepage from the tailings impoundment and Catchment Basin. The pumpback system continues to operate as designed. The fan in the Solvent Extraction (SX) Building is now operated continuously to exhaust any accumulated radon and radon daughters emanating from equipment stored there.

Current Use of Control Equipment
Concurrent with the suspension of mill operations in April 1983, all mill control systems have been shut down. The Mill and Solvent Extraction (SX) buildings are kept locked when personnel are not inside them. Security is maintained on site twenty-four (24) hours a day as required by Section 5.4 of the license application that is cited in License Condition 9.5 of SUA-1350, to prevent unauthorized access to the facility and unauthorized entry into the tailings impoundment. This prevents potential exposure to radioactive materials to unauthorized individuals, who may attempt to gain access to the facility buildings or the tailings impoundment. The tailings retention system continues as a passive control system incorporating a synthetic Hypalon liner to retain the tailings fluids. Seepage has occurred in the past due to a liner failure. The liner was discussed by Kent Bruxvoort of Telesto Solutions, Inc. in the 2011 Inspection of Tailings Impoundment Liner report dated June 22, 2011. The report states:

> *The liner is fully maintained and repaired within five vertical feet of the tailings or tailings fluid around the entire perimeter of the impoundment. The liner remains, by observation and testing, pliable. There is no evidence of exposed scrim by either physical or chemical means.*
>
> *Placement of the additional 11(e).2 soils from the catch basin area into the tailings impoundment, regrading of the tailings surface, maintenance and repair of the liner within five vertical feet of the tailings, and completion of lined evaporation lagoons all provide significant measures to manage the tailings. Potential for fluid to escape through the damaged liner is limited, potential for windblown tailings is decreased, potential for radon emissions is*

decreased, the surface of the tailings has been lowered to a level everywhere below the surrounding native ground surface, tailings consolidation throughout the impoundment is promoted, and evaporation is enhanced.

The impoundment's Hypalon liner is inspected weekly by site personnel to insure that it is maintained within five (5) vertical feet of the fluid surface.

A seepage collection (pumpback) system is in operation. This system was extended to include two (2) wells west of the Catchment Basin in 2005. A system using lagoons constructed on the tailings and operated during non-freezing weather serves to minimize dusting, reduce radon emanation and evaporate fluids. A substantial effort was made in 2008 to regrade / level the tailings in order to construct lined lagoons on the tailings surface to control dusting and aid in evaporation of tailings fluid and pumpback water. This effort has been successful and is described by Kent Bruxvoort of Telesto Solutions, Inc. in the 2010 Inspection of the Tailings Impoundment Liner dated July 8, 2010. The report states:

During the latter half of 2007 and in 2008 the tailings surface and the additional 11(e).2 soils were regraded. Beach sands were moved from the elevated western edge of the impoundment to the lower eastern portion of the impoundment. Substantial progress was thereby achieved toward meeting tailings management objectives: regrading the tailings to achieve a more regular surface in anticipation of either reclamation of future tailings storage; leveling the tailings to create a surface that is entirely below the bench, more sheltered from wind, and easier to keep moistened; covering the tailings to limit wind erosion potential; and creating stable, flat, bermed areas as evaporation lagoons for tailings dewatering.

The Low Volume air samples taken at Air 4A, (downwind of the tailings impoundment) show levels of natural uranium, thorium-230 and radium-226, which each remained below 1.0% of the allowable effluent concentrations during 2011, documenting the effectiveness of the lagoons and spray system in controlling dusting on the tailings impoundment. Evaporation will continue to decrease the potential of seepage from the impoundment. A fan is operated continuously in the Solvent Extraction (SX) Building to exhaust any accumulated radon and radon daughters emanating from equipment stored there.

Additional monitor wells were drilled in 2004 around the Catchment Basin. The nature and extent of the contamination of soils and ground water around the Catchment Basin has been described in submittals dated May 12, July 22 and December 15, 2004 and January 18, 2005. Fluid has been pumped out of one of the shallow monitor wells (TMW-90) beginning on September 4, 2003, under Safety and Environmental Evaluation (SEE) #6 and out of the second shallow monitor well (TMW-105) beginning on March 23, 2004 under an amendment to Safety and Environmental Evaluation (SEE) #6. Pumping of these wells was terminated in 2005 since they pumped dry. Additional information about these wells may be found in the Corrective Action Program (CAP) Review. These two wells were removed by the Catchment Basin Excavation in 2006. In addition, TMW-96 and TMW-97 were pumped during 2011.

A license amendment request to excavate the contaminated soils around the Catchment Basin and expand the pumpback system to include wells around the Catchment Basin was approved on May 26, 2005. During 2006 to 2007 a total of 233,268 cubic yards of contaminated soils were excavated around the Catchment Basin. The excavation area was gridded and sampled. It is now backfilled. The fire water lines removed during the course of that excavation were replaced by the end of 2008. The chain link fence along the east side of the Mill area removed by the excavation was replaced. The top of the grade beam was doweled into the twelve (12) inch slab on grade along the east wall of the Mill Building as recommended by QED Associates/JVA Incorporated to address the separation crack in the report dated November 5, 2007. A seepage collection system consisting of two lines of perforated pipe was installed along the west high wall at the excavation bottom to collect any seepage before it migrates to the Battle Spring Formation. To date no seepage has been detected in these collection systems. Plastic liner was placed on the west high wall to separate contaminated soils beneath the Mill Building and tank slabs from

the clean backfill. Details concerning the excavation were provided in the Catchment Basin Excavation Completion Report submitted on May 6, 2008. A request for additional Information (RAI) dated November 19, 2008 was received regarding the report. A response to the Request for Additional Information (RAI) was submitted by January 30, 2009. Pump back of contaminated Battle Spring Aquifer water around the Catchment Basin began in the summer of 2005. Details about this expansion of the pumpback system are included in the Corrective Action Program Review.

Oscar Paulson

In-House Review-2011.doc

Rio Tinto

Internal memo

26 February 2012

To: NRC File

Subject: Source Material License SUA-1350 - License Condition 12.3 – Annual ALARA Report

The following areas of the Sweetwater Uranium Project Radiation Safety Program were reviewed to determine if occupational radiation safety exposures were managed to be **A**s **L**ow **A**s **R**easonably **A**chievable (ALARA):

1. Employee Exposure Records:
Individual monitoring and reporting of employee exposures at the Sweetwater Uranium Project is not required as per 10 CFR 20.1502 since employees are unlikely to receive in excess of 10% of the limits for external or internal exposure. Gamma radiation levels and concentrations of airborne radionuclides are assessed and doses tracked to verify that employee doses are below the levels requiring individual monitoring and reporting.

2. Bioassay Results:
All bioassay results from site employees were below the first action level. In addition, pre-job bioassays were taken of any new contract employees and post-job bioassays collected from workers no longer working in the restricted area. All results were below the first action level. All bioassay results for personnel were non-detect (ND).

3. Inspections and Reports:
Daily Mill Foreman inspections and weekly work area inspections by the Radiation Safety Officer have been suspended during the period of mill shutdown as per a letter from the licensee dated June 10, 1983 and a response from NRC dated September 23, 1983.

4. Training:
Annual Radiation Worker Training was conducted on Thursday, January 6, 2011. Annual MSHA Refresher Training was conducted on Wednesday, January 5, 2011. In addition, driver training was conducted on Tuesday, January 4, 2011. Radiation training of individual contract employees (contractor new hires) was conducted on an as-needed basis. Equipment hazard training was provided on Tuesday, January 4, 2011.

5. Safety Meetings:
Radiation safety meetings were held on at least a monthly basis with site and applicable contract personnel. These are enumerated in this document.

6. Radiation Surveys and Sampling:
Gamma, radon and airborne uranium levels in the mill are low. Internal and external dose levels are below 10% of the applicable limits so individual monitoring of personnel and reporting of individual doses are not required.

7. Reports of Overexposure of Workers:
No overexposures have occurred.

8. Standard Operating Procedures (SOPs):
Standard Operating Procedures (SOPs) were reviewed during 2011, as documented in the memorandum entitled "Annual Review of Standard Operating Procedures (SOPs)", dated 29 December 2011.

9. Radiation Work Permits:
No radiation work permits were issued in 2011.

10. Nuclear Density Gauges:
All nuclear density gauges in the mill are stored in place with the shutters closed and locked. All nuclear density gauges are inventoried semiannually. The gauges were inventoried on June 15 and December 21, 2011. All nuclear density gauges in the mill were leak tested on May 24, 2007. All gauges passed the leak test. Leak testing of the gauges is only required every ten (10) years provided they are in storage and not being used, as is the case at the Sweetwater Uranium Project. An inspection by Nuclear Regulatory Commission (NRC) staff of the gauges was performed on April 22, 2010. No violations were identified. The license was renewed for ten (10) years on October 21, 2011.

11. Safety and Environmental Review Panel (SERP):
A single Safety and Environmental Evaluation (SEE) was issued by the Safety and Environmental Review Panel in 2011.

12. Instrument Calibrations:
Instrument calibrations were reviewed. All instruments were within their calibration interval when used.

13. Respiratory Protection:
Members of the site's respirator program were qualified for respirator use by a physician on July 21, July 24 and October 29, 2011. Annual fit testing and respirator training was conducted on August 25 and November 28, 2011.

The following is based on the review of the Radiation Safety Program:

Trends in Exposure
Operations were suspended in April 1983. The mill has been cleaned with the exception of the precipitation and drying areas, which are isolated. Exposures remain low since operations are suspended.

Some equipment stored on site, especially some steel pressure vessels stored in the grinding area of the mill, has created the potential for very slight increases in gamma doses. The gamma dose rates from this equipment are not sufficiently high to require posting under 10 CFR 20.1003; however, site employees have been instructed about the vessels and avoid them. The storage of this equipment has caused slight increases in exposure to individuals working near where the equipment is stored. In addition, the equipment has caused slightly elevated radon daughter concentrations in the Solvent Extraction (SX) Building. This situation was corrected by the installation of a vent fan. The vent fan in that building was adjusted to operate continuously beginning on December 11, 2001, to exhaust accumulated radon and radon daughters. Radon daughter concentrations in the Solvent Extraction (SX) Building averaged 0.026 WL in June 2011 and 0.017 WL in December 2011.

A single breathing zone sample collected on Tuesday, August 23, 2011 had elevated levels of natural uranium (4.81 E-12 µCi/m) and Thorium-230 (5.46 E-13 µCi/ml). These results were confirmed by the laboratory. This single sample increased calculated internal doses for the facility. It is unclear why these measured concentrations were so high. Upon receipt and confirmation of these results eleven (11) additional high volume air samples were collected in the Mill and Solvent Extraction buildings in an attempt to determine the cause of the elevated breathing zone sample. The results are documented in this report. It was not possible to question the employee regarding these results since he failed to report for work on Monday, August 29, 2011 and the contract employment agency was unable to locate him. None of the concentrations measured via the high volume air samples even approached the concentrations measured by the single breathing zone sample. Four (4) additional breathing zone samples were collected from another Mill Laborer (Mill Laborer-2) in November and December 2011 and none approached the concentrations reported for the Tuesday, August 23, 2011 breathing zone sample.

Current Use of Control Equipment
Since the mill is not operating use of control equipment is not required in the Mill Building. The mill and solvent extraction (SX) buildings are kept locked to control access. Lagoons are operated in the tailings impoundment when weather conditions permit to control dusting. A fan is operated continuously in the Solvent Extraction (SX) Building to vent any accumulated radon and radon daughters in the building.

The shutters on the nuclear density gauges in the mill are closed and locked.

Contaminated soils were excavated from the Catchment Basin area during 2006. These soils were spread on top of tailings in the tailings impoundment. These soils, since they were lower in radium-226 than the underlying tailings, reduced gamma exposures in the tailings impoundment by acting as shielding. Airborne radionuclide concentrations in the air samples related to the tailings impoundment have been low.

A discrete Shower/Change/Monitoring trailer was installed in the fence south of the Catchment Basin excavation in 2006 to provide a place for workers to shower, change and monitor, to assure that contamination was not being taken off site. This facility included a washing machine, showers and sinks that drained to a buried holding tank which could be pumped to the tailings impoundment. This facility was also used by tailings impoundment workers.

Work was performed in the tailings impoundment including liner repair, tailings regrading, and lagoon construction which has reduced the risk of wind induced liner failure and will ultimately enhance control of blowing tailings. This is discussed in greater detail in Sweetwater Uranium Project – Source Materials License SUA-1350: In-House Review of the Radiation Safety Program Including Audits, Inspections, Employee Exposures, Effluent Releases and Environmental Data as Required by License Condition 12.3

Possible Reduction of Exposure under the ALARA Concept
Exposures are at minimal levels due to suspension of operations. Access to known contaminated areas and to stored equipment with slightly elevated gamma levels is limited and controlled. All nuclear density gauge shutters are closed and locked. An amendment to the sealed source license BML-49-19005-01 dated April 9, 1998 was obtained which freed the licensee from the requirement of testing the on-off mechanism on the gauges every six (6) months. This amendment has caused some reduction in exposures by reducing the time that personnel have to work around the gauges and by eliminating personnel having to work with the gauge in the yellowcake barreling area thus reducing exposure to airborne yellowcake particles.

Oscar A Paulson
Oscar Paulson
Facility Supervisor
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Rio Tinto

Internal memo

20 February 2012

To: NRC File

Subject: Summary of Monthly Radiation Safety Meetings

The following is a summary of the twelve (12) monthly (plus eight (8) additional) Radiation Safety meetings held in 2011:

2011	TOPIC	ATTENDEES
1/18	Discussed Radon Emissions from Tailings and Evaporation Ponds – Presentation prepared by Doug Chambers of SENES Consultants, Ltd	KUC, ADC
1/25	Discussed potable water sampling / PWW-1 sample / uranium results..	KUC, ADC
2/24	Discussed Environmental Protection Agency presentation entitled Public and Worker Exposures at Legacy (Abandoned) Uranium Mines by Robert Durasky.	KUC
3/14	Discussed Fukushima power plants.	KUC
3/24	Discussed 40 CFR Part 61 Subpart W / Evaporation ponds planned for Energy Fuels Resources planned uranium mill.	KUC
4/27	Discussed 40 CFR Part 61 Subpart W – Uranium One America's letter / beta scanning of personnel.	KUC
5/17	Discussed PowerTech Uranium's proposed Dewey Burdock Mine.	KUC
6/6	Discussed tailings impoundment inspection report / NRC Information Notice 2011-09-Fixed Gauge Shutter Failures due to Operating in Harsh Working Environments.	KUC
6/28	Discussed Earthworks' document entitled Nuclear Power's Other Tragedy – Communities Living with Uranium Mining	KUC, ADC
7/27	Discussed Radon-222 and Radon-222 decay products / Discussed doses to site employees in 2010.	KUC, ADC
8/8	Discussed HP-38 / Consumption of water in the restricted area / Scanning and monitoring / bioassays / dosimeters.	KUC, ADC, ACI
8/9	Discussed Method 115 Testing / Radon-222 flux testing in the tailings impoundment.	KUC, ADC
8/23	Discussed radiation safety for crane inspections (Tyveks, dosimetry, bioassays and scanning/monitoring)	KUC, AEQ
8/25	Discussed radiation types (alpha, beta and gamma), respiratory protection, conducted respirator training and conducted a respirator fit test.	KUC, ADC, ACI
8/30	Discussed radiation safety for fire extinguisher checks (dosimetry, bioassays and scanning/monitoring)	KUC, GRN
9/12	Discussed Method 115 test results.	KUC, ACI
10/25	Discussed radiation safety for tailings impoundment repair work.	KUC, ACI
10/27	Discussed security of highly enriched uranium (HEU), high volume air samplers and breathing zone samples.	KUC, SEC
11/28	Discussed respiratory protection, conducted respirator training and performed respirator fit tests.	KUC, SEC
12/11	Discussed radon progeny measurements in Mill and Solvent Extraction Buildings and in other areas.	KUC, SEC

Initial key: **ADC** = Adecco USA, Inc. **AEQ** = American Equipment
KUC = Kennecott Uranium Company **ACI** = Archer Construction, Inc.
SEC = Securitas Security Services **GRN** = Simplex Grinnell

Oscar A Paulson

Oscar Paulson

Rio Tinto

Internal memo

16 February 2012

To: NRC File

Subject: Annual Radiation Refresher Training

Annual radiation safety training for uranium mill workers was conducted by Tetra Tech Inc. on January 6, 2011. All permanent site workers and contract workers receive annual radiation safety training for mill workers. Regarding radiation training for contract workers, "Regulatory Guide 8.31 Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Recovery Facilities will be as Low as is Reasonably Achievable, states: *Contractors that have work assignments in a UR facility should also be given appropriate training and safety instruction. Contractor workers who will perform work on heavily contaminated equipment should receive the same training and radiation safety instruction normally required of all permanent workers."* This training also included an introduction to respiratory protection.

A description of the course content and completion certificates are maintained in the file on site. The completed exams were retained by Tetra Tech, Inc. The attendees are listed below:

Jed Goodman – Archer Construction, Inc.	Harold Kelley – Kennecott Uranium Company
Kelly Haag – Adecco	George Palochak – "
Harry Lovato – L & L Electric	Oscar Paulson – "
Jim McCoy – Archer Construction, Inc.	Shelley Schutterle – "
Jim McMacken – Securitas Security Services	
Anita Morris – Robert Jack Smith & Associates	
Charles Rider – Securitas Security Services	

In addition, the following five (5) individuals were provided with radiation safety training for uranium mill workers on site at the listed dates:

Ronald Munguia	Adecco Services	May 31, 2011
Tony Jackson	Archer Construction, Inc.	July 21, 2011
Jeremy Levine	Archer Construction, Inc.	July 21, 2011
John Smith	Archer Construction, Inc.	July 21, 2011
Otis Smith	Archer Construction, Inc.	July 21, 2011

Oscar A Paulson

Oscar Paulson

Facility Supervisor

Annual RadRefreshTrng-2011.doc

Rio Tinto

Internal memo

25 February 2012

To: NRC File

SUBJECT: Internal Occupational Exposure Assessment – Suspended Operations

The following occupational exposure assessment is based on air samples taken in the Sweetwater Mill and Tailings Impoundment during 2011. Annual intakes (based on airborne concentrations and exposure times) below 10% of the applicable Allowable Limits of Intake (ALI) in Table 1, Column 1 of Appendix B (5 E-2 µCi for Class Y natural uranium) do not require individual monitoring or dose assessment. This assessment is of the Mill Foreman, who is the individual on site who spends the greatest amount of time within the restricted areas and receives the greatest exposure.

Airborne Particulate Air Sampling Results

The results of this sampling are attached. The sampling spreadsheets are listed on the following page.

Time Spent in the Mill Building, Tailings Impoundment and Catchment Basin Excavation (Restricted Area)

The following personnel spent the following times in the Sweetwater Mill and Solvent Extraction (SX) buildings and tailings impoundment:

Individual	Time in Mill and Solvent Extraction Buildings	Time in Tailings Impoundment
Facility Supervisor	306.2 hours	275.5 hours
Mill Foreman	240.0 hours	340.0 hours
Mill Laborer-1	140.0 hours	210.0 hours
Mill Laborer-2	93.0 hours	79.8 hours

This is a maximum estimate of time for January 1 to November 20, 2011, and is based upon the assumption that for each day an individual was in the Restricted Area he spent the entire ten (10) hour day there, even though on many occasions a visit to the mill or tailings impoundment in a given day constituted only a few hours inside the building or inside the impoundment. The days spent in each area are based on comments in the Alpha Monitor Record, which is signed upon completion of monitoring after leaving a Restricted Area. Beginning on November 21, 2011 personnel entering the Mill or SX buildings or the tailings impoundment were required to log their entry and exit times on the Alpha Monitor Record. A table listing the time the above listed personnel spent in various areas is included with this document.

Dose Calculation Method

10CFR20.1003 states, “Occupational dose does not include dose received from background radiation…”. In the interest of simplicity and conservatism, however, background airborne radionuclide concentrations have not been deducted from the concentrations, derived air concentrations (DACs) or percentages of allowable limits of intake (ALIs) presented in the table on the spreadsheet or text that follows.

The following additional steps were followed to ensure that the calculated dose is conservative:

- An assumption of ten (10) hours occupancy (a full working day) in either the Mill Building or tailings impoundment was assumed if personnel entered either area on a given day between January 1 and November 20, 2011, in spite of the fact that actual occupancy may have been far less. Beginning on November 21, 2011 personnel entering the Mill or SX buildings or the tailings impoundment were required to log their entry and exit times on the Alpha Monitor Record.

- The average and maximum airborne concentrations for natural uranium, thorium-230 and radium-226, based on breathing zone samples collected on personnel entering the Mill and SX buildings and high volume air samples collected in the Mill and SX buildings were used to calculate the doses to natural uranium, thorium-230 and radium-226 for the time spent in the Mill and SX buildings.
- The average and maximum airborne concentrations for natural uranium, thorium-230 and radium-226 based on high volume air samples were used to calculate the doses for natural uranium, thorium-230 and radium-226 for time spent in the tailings impoundment.
- The average and maximum air sample results for natural uranium, thorium-230 and radium-226 were used to calculate the internal dose since:
    - The breathing zone samples collected in the Mill Building are generally believed to be more representative of worker exposure than high volume air samples of the entire work area.

A single breathing zone sample collected on August 23, 2011 from the contract Mill Laborer was aberrant and showed the following results:

Date	Task	Volume (milliliters)	Sample Lower Limit of Detection (LLD) (microCurie per milliliter)	Natural Uranium (microCurie per milliliter)	Thorium-230 (microCurie per milliliter)	Radium-226 (microCurie per milliliter)	Natural Uranium % of DAC (Percent)	Thorium 230 % of DAC (Percent)	Radium 226 % of DAC (Percent)
23-Aug-11	Mill Laborer 1	1.39E+06	1.00E-16	4.56E-12	4.92E-13	3.18E-13	22.800	8.200	0.106
23-Aug-11	Mill Laborer 1	1.39E+06	1.00E-16	5.05E-12	5.99E-13	3.18E-13	25.250	9.983	0.106
8/23/2011-Average	Mill Laborer 1	1.39E+06	1.00E-16	4.81E-12	5.46E-13	3.18E-13	24.025	9.092	0.106
Average:		1.39E+06	1.00E-16	4.81E-12	5.46E-13	3.18E-13	2.40E+01	9.09E+00	1.06E-01

Notes: All results listed on the laboratory reports as being less than the specific sample's Lower Limit of Detection (LLD) are entered at the LLD value of 1.00E-16 microCuries per milliliter.
Air sample results plus time spent in the restricted area to date show that the Mill Laborer -1 was unlikely to have received in excess of 10% of the applicable ALI thus individual monitoring of intakes is not required.

Derived Air Concentrations Used	microCurie per milliliter		
Natural Uranium	2.00E-11	Year	(Conservative)
Radium-226	3.00E-10	Week	
Thorium-230	6.00E-12	Year	(Conservative)

Initial result

Laboratory recheck

Average

The breathing zone sample was collected on Tuesday, August 23, 2011 and sent to the laboratory for analysis. The contract Mill Laborer failed to report to work on Monday, August 29, 2011 and the labor contractor was unable to ever locate him. When the analysis results for the filter were received, the laboratory was immediately asked to rerun the sample, which was done. The recheck result was similar to the initial result, as shown above. Being that the contract Mill Laborer failed to report for work on Monday, August 29, 2011 and all attempts to locate him failed, there was no opportunity to question him regarding the breathing zone sample in an attempt to determine why the natural uranium and Thorium-230 activities were so high. No breathing zone sample filter in the past twenty (20) years on site had such a high natural uranium activity. This is especially puzzling given the fact that all stored product on site was removed in the Fall of 2004 and the facility is not operating. Regardless, a decision was made not to disregard this sample result, but rather to use it in the dose assessment since the contract Mill Laborer could not be questioned to determine if somehow the filter had gotten contaminated.

In order to attempt to determine if any elevated natural uranium activities in air existed in the Mill or SX buildings, an additional eleven (11) high volume air samples (above and beyond the two (2) normally collected) were taken in the Mill and SX buildings. All of these additional samples showed no aberrant natural uranium activity in air. The cause of the elevated natural uranium activity in the Tuesday, August 23, 2011 breathing zone sample has not been determined.

Attached please find in addition to the spreadsheets entitled “Airborne Sampling Results” using average values and using maximum values broken down by quarter, the following spreadsheets:

- Mill High Volume Air Samples
- Tailings Impoundment High Volume Air Samples
- Mill Foreman Breathing Zone Samples
- Mill Laborer-1 Breathing Zone Samples
- Mill Laborer-2 Breathing Zone Samples
- Spreadsheet showing times in the Mill and SX buildings and tailings impoundment for the Mill Foreman, Mill Laborer-1, Mill Laborer-2 and Facility Supervisor
- Airborne Particulate Dose using maximum quarterly breathing zone samples
- Airborne Particulate Dose using average quarterly breathing zone samples
- Maximum inhaled intake based on quarterly breathing zone sample results
- Airborne Particulate Dose using the highest airborne sampling results for 2011 for natural uranium, Radium-226 and Thorium-230 and the maximum hours spent by any individual on site in the Mill and SX buildings and tailings impoundment (Absolute maximum airborne particulate dose scenario)
- Maximum Potential Weekly Exposure to Soluble Uranium using the maximum airborne activity of natural uranium measured in 2011 and assuming an individual worked an entire forty (40) hour week in that airborne concentration

Dose Calculation Results

An internal dose of 87.0 millirems (0.087 rems) was calculated for the maximally exposed individual (the Mill Foreman) using the highest quarterly breathing zone sample results collected in the Mill and SX buildings and the highest high volume air sampling results from the tailings impoundment and the exposure times included in the attached spreadsheets. This calculation is on the attached spreadsheet entitled Airborne Sampling Results (Using Maximum Values). A second calculation was made using the average natural uranium, radium-225 and thorium-230 results from breathing zone samples collected in the Mill and SX buildings and high volume air sampling results from the tailings impoundment on a quarterly basis. This calculation resulted in an internal dose of 83.2 millirems (0.083 rems). This calculation is on the attached spreadsheet entitled Airborne Sampling Results (Using Average Values). An absolute maximum airborne particulate dose scenario was also run by applying the highest airborne concentrations of natural uranium, Radium-226 and Thorium-230 measured in the Mill and Solvent Extraction buildings and tailings impoundment along with the longest lengths of time spent by any individual in these areas. The result was a total internal dose from natural uranium, Radium-226 and Thorium-230 of 273 millirems (0.273 rems). This is below 10% of the Allowable Limit of Intake (ALI) since a dose of one (1) ALI comprises an internal dose of 5,000 millirems.

These calculated doses are all less than 10% of the 5,000 millirem internal dose limit (500 millirems), above which individual monitoring is required as per 10 CFR 20.1502(b)(1). Also, the maximally exposed individual received less than 10% of the ALI for natural uranium, Radium-226 and Thorium-230 when working in the Mill and SX buildings and tailings impoundment, meaning that no worker was "…likely to receive in 1 year an intake in excess of 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2 of Appendix B to §20.1001-21.2401:…" Thus, individual monitoring of occupational intake for airborne particulate radionuclides was not required.

Oscar A. Paulson

InternalOccExpAssess-2011.doc

2011

Hours Worked in Restricted Areas

Date	Mill Foreman		Mill Laborer - 1		Mill Laborer - 2		Facility Supervisor	
	Mill	Tailings	Mill	Tailings	Mill	Tailings	Mill	Tailings
1/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/5/2011	0	0	0	0	0.0	0.0	10.0	0.0
1/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/13/2011	0	10	0	0	0.0	0.0	0.0	0.0
1/14/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/15/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/20/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/25/2011	10	0	0	0	0.0	0.0	10.0	0.0
1/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/28/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
1/31/2011	10	0	0	0	0.0	0.0	0.0	0.0
2/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/3/2011	10	0	0	0	0.0	0.0	0.0	0.0
2/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/5/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/6/2011	10	0	0	0	0.0	0.0	0.0	0.0
2/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/14/2011	10	0	0	0	0.0	0.0	0.0	0.0
2/15/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/20/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/22/2011	0	10	0	0	0.0	0.0	0.0	0.0
2/23/2011	10	0	0	0	0.0	0.0	0.0	0.0
2/24/2011	0	10	0	0	0.0	0.0	0.0	0.0
2/25/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
2/28/2011	5	5	0	0	0.0	0.0	0.0	0.0
3/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/5/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/8/2011	10	0	0	0	0.0	0.0	0.0	0.0

2011

Hours Worked in Restricted Areas

Date	Mill Foreman		Mill Laborer - 1		Mill Laborer - 2		Facility Supervisor	
	Mill	Tailings	Mill	Tailings	Mill	Tailings	Mill	Tailings
3/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/10/2011	10	0	0	0	0.0	0.0	0.0	0.0
3/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/14/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/15/2011	10	0	0	0	0.0	0.0	10.0	0.0
3/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/20/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/25/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/28/2011	0	10	0	0	0.0	0.0	0.0	0.0
3/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
3/30/2011	0	10	0	0	0.0	0.0	0.0	0.0
3/31/2011	5	5	0	0	0.0	0.0	10.0	0.0
4/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/5/2011	5	5	0	0	0.0	0.0	0.0	0.0
4/6/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/7/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/12/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/14/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/15/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/19/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/20/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/21/2011	0	10	0	0	0.0	0.0	0.0	0.0
4/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/25/2011	10	0	0	0	0.0	0.0	0.0	0.0
4/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/28/2011	10	0	0	0	0.0	0.0	0.0	0.0
4/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
4/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/2/2011	0	10	0	0	0.0	0.0	5.0	5.0
5/3/2011	0	0	0	0	0.0	0.0	5.0	5.0
5/4/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/5/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/9/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/10/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/11/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/14/2011	0	0	0	0	0.0	0.0	0.0	0.0

2011

Hours Worked in Restricted Areas

Date	Mill Foreman		Mill Laborer - 1		Mill Laborer - 2		Facility Supervisor	
	Mill	Tailings	Mill	Tailings	Mill	Tailings	Mill	Tailings
5/15/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/16/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/19/2011	0	0	0	0	0.0	0.0	10.0	0.0
5/20/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/24/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/25/2011	0	10	0	0	0.0	0.0	0.0	0.0
5/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/28/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
5/31/2011	10	0	0	0	0.0	0.0	0.0	0.0
6/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/2/2011	0	10	5	5	0.0	0.0	0.0	0.0
6/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/5/2011	0	10	0	0	0.0	0.0	0.0	0.0
6/6/2011	0	0	0	0	0.0	0.0	10.0	0.0
6/7/2011	0	10	0	0	0.0	0.0	10.0	0.0
6/8/2011	0	10	0	10	0.0	0.0	10.0	0.0
6/9/2011	0	10	0	10	0.0	0.0	10.0	0.0
6/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/13/2011	5	5	5	5	0.0	0.0	0.0	10.0
6/14/2011	0	10	0	10	0.0	0.0	10.0	0.0
6/15/2011	5	5	5	5	0.0	0.0	5.0	5.0
6/16/2011	0	10	0	0	0.0	0.0	0.0	0.0
6/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/20/2011	10	0	10	0	0.0	0.0	0.0	0.0
6/21/2011	0	0	10	0	0.0	0.0	10.0	0.0
6/22/2011	0	10	0	10	0.0	0.0	0.0	0.0
6/23/2011	0	10	0	10	0.0	0.0	0.0	0.0
6/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/25/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
6/27/2011	0	0	10	0	0.0	0.0	0.0	0.0
6/28/2011	0	0	10	0	0.0	0.0	0.0	0.0
6/29/2011	10	0	10	0	0.0	0.0	0.0	0.0
6/30/2011	5	5	5	5	0.0	0.0	10.0	0.0
7/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/5/2011	5	5	5	5	0.0	0.0	0.0	0.0
7/6/2011	10	0	10	0	0.0	0.0	0.0	0.0
7/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/11/2011	5	5	5	5	0.0	0.0	0.0	0.0
7/12/2011	10	0	0	0	0.0	0.0	5.0	5.0
7/13/2011	0	0	0	0	0.0	0.0	0.0	10.0
7/14/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/15/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/18/2011	0	0	0	10	0.0	0.0	0.0	0.0
7/19/2011	0	0	0	0	0.0	0.0	0.0	10.0
7/20/2011	0	0	0	0	0.0	0.0	0.0	0.0

2011

Hours Worked in Restricted Areas

Date	Mill Foreman		Mill Laborer - 1		Mill Laborer - 2		Facility Supervisor	
	Mill	Tailings	Mill	Tailings	Mill	Tailings	Mill	Tailings
7/21/2011	0	0	10	0	0.0	0.0	0.0	0.0
7/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/25/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/26/2011	0	0	5	5	0.0	0.0	5.0	5.0
7/27/2011	0	0	0	10	0.0	0.0	0.0	0.0
7/28/2011	0	0	5	5	0.0	0.0	0.0	0.0
7/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
7/31/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/2/2011	0	0	0	10	0.0	0.0	0.0	0.0
8/3/2011	0	0	0	10	0.0	0.0	0.0	0.0
8/4/2011	0	0	5	5	0.0	0.0	0.0	0.0
8/5/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/8/2011	0	0	0	10	0.0	0.0	0.0	10.0
8/9/2011	0	0	0	0	0.0	0.0	0.0	10.0
8/10/2011	0	0	0	10	0.0	0.0	0.0	10.0
8/11/2011	0	0	0	10	0.0	0.0	0.0	10.0
8/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/14/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/15/2011	0	0	10	0	0.0	0.0	5.0	5.0
8/16/2011	0	0	5	5	0.0	0.0	0.0	10.0
8/17/2011	0	0	0	10	0.0	0.0	0.0	0.0
8/18/2011	0	0	0	10	0.0	0.0	0.0	10.0
8/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/20/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/23/2011	0	0	5	5	0.0	0.0	5.0	5.0
8/24/2011	0	0	0	0	0.0	0.0	0.0	10.0
8/25/2011	0	0	0	10	0.0	0.0	0.0	10.0
8/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/28/2011	0	0	0	0	0.0	0.0	0.0	0.0
8/29/2011	0	0	0	0	0.0	0.0	0.0	10.0
8/30/2011	0	0	0	0	0.0	0.0	10.0	0.0
8/31/2011	0	0	0	0	0.0	0.0	0.0	10.0
9/1/2011	0	0	0	0	0.0	0.0	0.0	10.0
9/2/2011	0	0	0	0	0.0	0.0	0.0	10.0
9/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/5/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/8/2011	0	0	5	5	0.0	0.0	0.0	0.0
9/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/12/2011	0	0	0	0	0.0	0.0	0.0	10.0
9/13/2011	0	0	0	0	0.0	0.0	5.0	5.0
9/14/2011	0	0	0	0	0.0	0.0	10.0	0.0
9/15/2011	0	0	0	0	0.0	0.0	10.0	0.0
9/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/19/2011	0	0	0	0	0.0	10.0	0.0	0.0
9/20/2011	0	0	0	0	0.0	10.0	0.0	10.0
9/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/22/2011	0	0	0	0	5.0	5.0	5.0	5.0
9/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/25/2011	0	0	0	0	0.0	0.0	0.0	0.0

2011

Hours Worked in Restricted Areas

Date	Mill Foreman		Mill Laborer - 1		Mill Laborer - 2		Facility Supervisor	
	Mill	Tailings	Mill	Tailings	Mill	Tailings	Mill	Tailings
9/26/2011	0	0	0	0	0.0	0.0	5.0	5.0
9/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/28/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
9/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/1/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/3/2011	0	0	0	0	0.0	10.0	0.0	10.0
10/4/2011	0	0	0	0	10.0	0.0	10.0	0.0
10/5/2011	0	0	0	0	10.0	0.0	5.0	5.0
10/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/11/2011	10		0	0	10.0	0.0	10.0	0.0
10/12/2011	10		0	0	0.0	10.0	0.0	10.0
10/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/14/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/15/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/17/2011	10		0	0	0.0	10.0	0.0	0.0
10/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/20/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/21/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/25/2011	0	0	0	0	0.0	0.0	0.0	10.0
10/26/2011	0	0	0	0	0.0	0.0	10.0	0.0
10/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/28/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/29/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
10/31/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/1/2011	0	0	0	0	10.0	0.0	0.0	0.0
11/2/2011	10	0	0	0	10.0	0.0	10.0	0.0
11/3/2011	0	0	0	0	10.0	0.0	0.0	0.0
11/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/5/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/6/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/8/2011	0	0	0	0	0.0	0.0	10.0	0.0
11/9/2011	0	0	0	0	0.0	0.0	10.0	0.0
11/10/2011	0	0	0	0	0.0	0.0	10.0	0.0
11/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/12/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/13/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/14/2011	0	0	0	0	10.0	0.0	0.0	0.0
11/15/2011	0	0	0	0	5.0	5.0	10.0	0.0
11/16/2011	0	0	0	0	5.0	5.0	5.0	5.0
11/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/20/2011	0	0	0	0	0.0	0.0	5.0	5.0
11/21/2011	0	0	0	0	0.0	0.0	0.8	0.0
11/22/2011	0	0	0	0	0.0	0.0	0.4	0.0
11/23/2011	0	0	0	0	0.0	0.0	0.0	2.1
11/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/25/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/27/2011	0	0	0	0	0.0	0.0	0.0	0.0
11/28/2011	0	0	0	0	0.0	0.3	0.0	0.0
11/29/2011	0	0	0	0	2.9	0.0	1.1	0.0
11/30/2011	0	0	0	0	0.0	1.8	0.9	0.0
12/1/2011	0	0	0	0	5.1	0.0	1.2	0.0

2011

Hours Worked in Restricted Areas

Date	Mill Foreman		Mill Laborer - 1		Mill Laborer - 2		Facility Supervisor	
	Mill	Tailings	Mill	Tailings	Mill	Tailings	Mill	Tailings
12/2/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/3/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/4/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/5/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/6/2011	0	0	0	0	0.0	0.0	0.2	2.0
12/7/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/8/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/9/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/10/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/11/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/12/2011	0	0	0	0	0.0	2.9	0.0	0.0
12/13/2011	0	0	0	0	0.0	2.8	1.7	1.0
12/14/2011	0	0	0	0	0.0	4.2	0.5	2.5
12/15/2011	0	0	0	0	0.0	0.8	0.0	0.0
12/16/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/17/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/18/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/19/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/20/2011	0	0	0	0	0.0	0.0	2.0	0.9
12/21/2011	0	0	0	0	0.0	0.0	0.7	0.8
12/22/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/23/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/24/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/25/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/26/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/27/2011	0	0	0	0	0.0	2.1	0.3	0.0
12/28/2011	0	0	0	0	0.0	0.0	1.5	0.0
12/29/2011	0	0	0	0	0.0	0.0	0.0	1.2
12/30/2011	0	0	0	0	0.0	0.0	0.0	0.0
12/31/2011	0	0	0	0	0.0	0.0	0.0	0.0
Total:	**240**	**340**	**140**	**210**	**93.0**	**79.8**	**306.2**	**275.5**

Notes:

If an employee scanned on a given day, it is assumed that the employee was in the restricted ara for the entire ten (10) hour shift regardless of actual time spent there. This maintains a conservative estimate of dose. This applies from January 1 to November 20, 2011.

If Mill or SX appear in the comments the time is assigned to the Mill and assigned that level of airborne exposure

If Tails appears in the comments the time is assigned to the tailings impoundment and assigned that level of exposure.

If both Tails and either Mill, SX or Mill/SX appear in the comments, five (5) hours are assigned to the tailings impoundment and five (5) hours are assigned to the Mill and these hours are assigned appropriate levels of exposure for the Mill and tailings impoundment.

Beginning on November 21, 2011, personnel were required to log the time they entered or left the Mill or Solvent Extraction (SX) Buildings or tailings impoundment to enable more accurate estimation of doses.

Kennecott Uranium Company										
Sweetwater Uranium Project										
Tailings Impoundment										
High Volume Air Samples										
Sample Number	**Date**		**Volume**	**Sample Lower Limit of Detection (LLD)**	**Natural Uranium**	**Thorium 230**	**Radium 226**	**Natural Uranium % of DAC**	**Thorium 230 % of DAC**	**Radium 226 % of DAC**
	Start	**Stop**	**(milliliters)**	**(microCurie per milliliter)**	**(microCurie per milliliter)**	**(microCurie per milliliter)**	**(microCurie per milliliter)**	**(Percent)**	**(Percent)**	**(Percent)**
1	2-May-11	3-May-11	2.29E+09	1.00E-16	1.94E-15	3.70E-15	1.98E-15	9.70E-03	6.17E-02	6.60E-04
2	8-Aug-11	25-Aug-11	7.68E+09	1.00E-16	9.37E-16	1.94E-15	1.06E-15	4.69E-03	3.23E-02	3.53E-04
3	20-Jan-11	21-Nov-11	2.65E+09	1.00E-16	1.19E-15	4.83E-15	5.34E-16	5.95E-03	8.05E-02	1.78E-04
Average:			4.21E+09		1.36E-15	3.49E-15	1.19E-15	6.78E-03	5.82E-02	3.97E-04
Derived Air Concentrations Used										
	microCurie per milliliter									
Natural Uranium	2.00E-11	Year	**(Conservative)**							
Radium-226	3.00E-10	Week								
Thorium-230	6.00E-12	Year	**(Conservative)**							
Notes:										
	Air sampler was located near the northeast corner of the interior of the impoundment.									
	Air sampler was pointed southwest into the prevailing wind to maximize radionuclide concentrations.									
	No sample exceeded effluent limits for natural uranium, radium-226 or thorium-230 in spite of the fact that they were collected inside of the impoundment.									
		Multiday composite								

Kennecott Uranium Company											
Sweetwater Uranium Project											
Mill Building											
High Volume Air Samples											
Sample Number	**Date**			**Volume**	**Sample Lower Limit of Detection (LLD)**	**Natural Uranium**	**Thorium 230**	**Radium 226**	**Natural Uranium % of DAC**	**Thorium 230 % of DAC**	**Radium 226 % of DAC**
	Start	**Stop**		**(milliliters)**	**(microCurie per milliliter)**	**(microCurie per milliliter)**	**(microCurie per milliliter)**	**(microCurie per milliliter)**	**(Percent)**	**(Percent)**	**(Percent)**
1	2-May-11	3-May-11	Mill Grinding Area	2.43E+09	1.00E-16	1.58E-15	7.76E-16	4.70E-16	7.90E-03	1.29E-02	1.57E-04
2	2-May-11	3-May-11	Mill Precipitation Area	2.57E+09	1.00E-16	1.86E-15	9.32E-16	8.08E-16	9.30E-03	1.55E-02	2.69E-04
3	3-May-11	4-May-11	Solvent Extraction (SX) Building	2.22E+09	1.00E-16	1.93E-15	1.22E-15	7.10E-16	9.65E-03	2.03E-02	2.37E-04
4	9-Nov-11	10-Nov-11	Leaching Area - Leach Floor	2.66E+09	1.00E-16	2.21E-14	4.65E-15	2.68E-15	1.11E-01	7.75E-02	8.93E-04
5	8-Nov-11	9-Nov-11	Grinding Area - Below Leach Deck (Normal Semiannual Sampling Location)	2.46E+09	1.00E-16	1.42E-15	7.03E-16	6.14E-16	7.10E-03	1.17E-02	2.05E-04
6	15-Nov-11	16-Nov-11	Precipitation Area - Scrubber Deck	2.52E+09	1.00E-16	4.02E-15	7.49E-16	6.52E-16	2.01E-02	1.25E-02	2.17E-04
7	20-Nov-11	21-Nov-11	Precipitation Area - Bottom Floor	2.74E+09	1.00E-16	3.97E-15	5.82E-16	5.39E-16	1.99E-02	9.70E-03	1.80E-04
8	8-Nov-11	9-Nov-11	Grinding Area - Floor	2.66E+09	1.00E-16	2.01E-15	8.22E-16	9.86E-16	1.01E-02	1.37E-02	3.29E-04
9	9-Nov-11	10-Nov-11	Grinding Area - Second Deck	2.56E+09	1.00E-16	1.13E-14	2.93E-15	2.34E-15	5.65E-02	4.88E-02	7.80E-04
10	9-Nov-11	10-Nov-11	Leaching Area - Top of Leach	2.69E+09	1.00E-16	1.01E-14	3.09E-15	1.57E-15	5.05E-02	5.15E-02	5.23E-04
11	9-Nov-11	10-Nov-11	Precipitation Area - Precipitation Deck (Normal Semiannual Sampling Location)	2.70E+09	1.00E-16	4.74E-15	1.84E-15	1.06E-15	2.37E-02	3.07E-02	3.53E-04
12	15-Nov-11	16-Nov-11	Counter Current Decantation Area - Top	2.09E+09	1.00E-16	2.61E-15	1.78E-15	1.85E-15	1.31E-02	2.97E-02	6.17E-04
13	15-Nov-11	16-Nov-11	Counter Current Decantation Area - Bottom	2.74E+09	1.00E-16	5.12E-15	8.67E-16	8.51E-16	2.56E-02	1.45E-02	2.84E-04
14	15-Nov-11	16-Nov-11	Precipitation Area - Centrifuge Deck	2.44E+09	1.00E-16	2.63E-15	8.29E-16	8.09E-16	1.32E-02	1.38E-02	2.70E-04
15	20-Nov-11	21-Nov-11	Solvent Extraction (SX) Building - Top	2.66E+09	1.00E-16	2.72E-15	1.08E-15	5.59E-16	1.36E-02	1.80E-02	1.86E-04
16	21-Nov-11	22-Nov-11	Solvent Extraction Building - Bottom	2.19E+09	1.00E-16	3.69E-15	6.19E-16	7.90E-16	1.85E-02	1.03E-02	2.63E-04
Average:				2.52E+09		5.11E-15	1.47E-15	1.08E-15	2.56E-02	2.44E-02	3.60E-04
Derived Air Concentrations Used											
	microCurie per milliliter										
Natural Uranium	2.00E-11	Year	**(Conservative)**								
Radium-226	3.00E-10	Week									
Thorium-230	6.00E-12	Year	**(Conservative)**								

Kennecott Uranium Company
Sweetwater Uranium Project
Mill Foreman
Breathing Zone Samples

Date	Task	Volume (milliliters)	Sample Lower Limit of Detection (LLD) (microCurie per milliliter)	Natural Uranium (microCurie per milliliter)	Thorium-230 (microCurie per milliliter)	Radium-226 (microCurie per milliliter)	Natural Uranium % of DAC (Percent)	Thorium 230 % of DAC (Percent)	Radium 226 % of DAC (Percent)
31-Mar-11	Mill Foreman	9.64E+05	1.00E-16	3.43E-13	5.68E-13	7.53E-13	1.715	9.467	0.251
31-Mar-11	Mill Foreman	9.64E+05	1.00E-16	3.43E-13	7.98E-13	2.44E-13	1.715	13.300	0.081
3/31/2011 - Average	Mill Foreman	9.64E+05	1.00E-16	3.43E-13	6.83E-13	4.99E-13	1.715	11.383	0.166
30-Jun-11	Mill Foreman	1.09E+06	1.00E-16	8.23E-13	4.39E-13	-2.39E-13	4.115	7.317	-0.080
Average:		1.03E+06	1.00E-16	5.83E-13	5.61E-13	1.30E-13	2.92E+00	9.35E+00	4.33E-02

Notes: All results listed on the laboratory reports as being less than the specific sample's Lower Limit of Detection (LLD) are entered at the LLD value of 1.00E-16 microCuries per milliliter.
Air sample results plus time spent in the restricted area to date show that the Mill Foreman was unlikely to have received in excess of 10% of the applicable ALI thus individual monitoring of of intakes is not required.
Some results for Radium-226 were reported as negative values signifying concentrations below the Lower Limit of Detection (LLD).
Used average result for natural uranium for the first quarter breathing zone sample.

Derived Air Concentrations Used

	microCurie per milliliter	
Natural Uranium	2.00E-11	Year
Radium-226	3.00E-10	Week
Thorium-230	6.00E-12	Year

Initial result
Laboratory recheck
Average

Kennecott Uranium Company
Sweetwater Uranium Project
Mill Laborer - 1
Breathing Zone Samples

Date	Task	Volume (milliliters)	Sample Lower Limit of Detection (LLD) (microCurie per milliliter)	Natural Uranium (microCurie per milliliter)	Thorium-230 (microCurie per milliliter)	Radium-226 (microCurie per milliliter)	Natural Uranium % of DAC (Percent)	Thorium 230 % of DAC (Percent)	Radium 226 % of DAC (Percent)
23-Aug-11	Mill Laborer 1	1.39E+06	1.00E-16	4.56E-12	4.92E-13	3.18E-13	22.800	8.200	0.106
23-Aug-11	Mill Laborer 1	1.39E+06	1.00E-16	5.05E-12	5.99E-13	3.18E-13	25.250	9.983	0.106
8/23/2011 - Average	Mill Laborer 1	1.39E+06	1.00E-16	4.81E-12	5.46E-13	3.18E-13	24.025	9.092	0.106
Average:		1.39E+06	1.00E-16	4.81E-12	5.46E-13	3.18E-13	2.40E+01	9.09E+00	1.06E-01

Notes: All results listed on the laboratory reports as being less than the specific sample's Lower Limit of Detection (LLD) are entered at the LLD value of 1.00E-16 microCuries per milliliter.
Air sample results plus time spent in the restricted area to date show that the Mill Laborer -1 was unlikely to have received in excess of 10% of the applicable ALI thus individual monitoring of intakes is not required.

Derived Air Concentrations Used

	microCurie per milliliter		
Natural Uranium	2.00E-11	Year	**(Conservative)**
Radium-226	3.00E-10	Week	
Thorium-230	6.00E-12	Year	**(Conservative)**

Initial result
Laboratory recheck
Average

Kennecott Uranium Company
Sweetwater Uranium Project
Mill Laborer - 2
Breathing Zone Samples

Date	Task	Volume (milliliters)	Sample Lower Limit of Detection (LLD) (microCurie per milliliter)	Natural Uranium (microCurie per milliliter)	Thorium-230 (microCurie per milliliter)	Radium-226 (microCurie per milliliter)	Natural Uranium % of DAC (Percent)	Thorium 230 % of DAC (Percent)	Radium 226 % of DAC (Percent)
1-Nov-11	Mill Laborer - 2	2.79E+06	1.00E-16	4.23E-13	3.67E-13	5.88E-14	2.115	6.117	0.020
2-Nov-11	Mill Laborer - 2	2.08E+06	1.00E-16	2.48E-13	2.39E-13	2.36E-13	1.240	3.983	0.079
14-Nov-11	Mill Laborer - 2	2.52E+06	1.00E-16	1.11E-13	8.22E-14	-3.33E-14	0.555	1.370	-0.011
1-Dec-11	Mill Laborer - 2	2.61E+06	1.00E-16	1.32E-13	1.70E-13	ND	0.660	2.833	ND
Average:		2.50E+06	1.00E-16	2.29E-13	2.15E-13	8.72E-14	1.14E+00	3.58E+00	2.91E-02

Notes: All results listed on the laboratory reports as being less than the specific sample's Lower Limit of Detection (LLD) are entered at the LLD value of 1.00E-16 microCuries per milliliter.
Air sample results plus time spent in the restricted area to date show that the Mill Laborer - 2 was unlikely to have received in excess of 10% of the applicable ALI thus individual monitoring of intakes is not required.
Some results for Radium-226 were reported as negative values signifying concentrations below the Lower Limit of Detection (LLD).

Derived Air Concentrations Used

	microCurie per milliliter	
Natural Uranium	2.00E-11 Year	**(Conservative)**
Radium-226	3.00E-10 Week	
Thorium-230	6.00E-12 Year	**(Conservative)**

Kennecott Uranium Company
Sweetwater Uranium Project

Airborne Sampling Results: 2011
(Using Maximum Values)

Breathing Zone Samples - Annual Dose								
Maximum for 2011	**Quarter**	**Exposed Individual**	**Concentration**			**Percent of DAC**		
			(Natural Uranium Only)	**Radium-226**	**Thorium-230**	**Natural Uranium**	**Radium-226**	**Thorium-230**
			(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**			
	First	Mill Foreman	3.43E-13	4.99E-13	6.83E-13	1.72E+00	1.66E-01	1.14E+01
	Second	Mill Foreman	8.23E-13	-2.39E-13	4.39E-13	4.12E+00	-7.97E-02	7.32E+00
	Third	Mill Laborer - 1	4.81E-12	3.18E-13	5.46E-13	2.40E+01	1.06E-01	9.09E+00
	Fourth	Mill Laborer -2	4.23E-13	2.36E-13	3.67E-13	2.12E+00	7.87E-02	6.12E+00
Please see attached spreadsheets								
Lower Limit of Detection (LLD) value used in average if result was non-detect.								
High Volume Air Sampling								
Date		**Location**	**Concentration**			**Percent of DAC**		
			Natural Uranium	**Radium-226**	**Thorium-230**	**Natural Uranium**	**Radium-226**	**Thorium-230**
			(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**			
Maximum for 2011		Mill Building	2.21E-14	2.68E-15	4.65E-15	1.11E-01	8.93E-04	7.75E-02
Maximum for 2011		Tailings Impoundment	1.94E-15	1.98E-15	4.83E-15	9.70E-03	6.60E-04	8.05E-02
		Maximum	2.21E-14	2.68E-15	4.83E-15	6.01E-02	7.77E-04	1.67E-03
Please see attached spreadsheets								
Lower Limit of Detection (LLD) value used in average if result was non-detect.								

Exposure Calculations									
Hours Worked During 2011				Hours					
	First Quarter	Mill Foreman	Mill	100.0					
			Tailings Impoundment	60.0					
	Second Quarter	Mill Foreman	Mill	70.0					
			Tailings Impoundment	270.0					
	Third Quarter	Mill Foreman	Mill	30.0					
			Tailings Impoundment	10.0					
	Fourth Quarter	Mill Foreman	Mill	40.0					
			Tailings Impoundment	0.0					
	Total	Mill Foreman	Mill	240.0					
			Tailings Impoundment	340.0					
	First Quarter	Facility Supervisor	Mill	40.0					
			Tailings Impoundment	0.0					
	Second Quarter	Facility Supervisor	Mill	95.0					
			Tailings Impoundment	25.0					
	Third Quarter	Facility Supervisor	Mill	65.0					
			Tailings Impoundment	195.0					
	Fourth Quarter	Facility Supervisor	Mill	106.2					
			Tailings Impoundment	55.5					
	Total	Facility Supervisor	Mill	306.2					
			Tailings Impoundment	275.5					
	Second Quarter	Mill Laborer -1	Mill	70.0					
			Tailings Impoundment	70.0					
	Third Quarter	Mill Laborer -1	Mill	70.0					
			Tailings Impoundment	140.0					
	Total	Mill Laborer -1	Mill	140.0					
			Tailings Impoundment	210.0					
	Third Quarter	Mill Laborer -2	Mill	5.0					
			Tailings Impoundment	25.0					
	Fourth Quarter	Mill Laborer -2	Mill	88.0					
			Tailings Impoundment	54.8					
	Total	Mill Laborer -2	Mill	93.0					
			Tailings Impoundment	79.8					

Exposure			Natural Uranium (millirems)	Radium-226 (millirems)	Thorium-230 (millirems)		Total (millirems)		
	First Quarter	Mill Foreman - Mill	4.29E+00	4.15E-01	2.85E+01		3.32E+01		
		Mill Foreman - Tailings	1.46E-02	9.90E-04	1.21E-01		1.36E-01		
	Second Quarter	Mill Foreman - Mill	7.20E+00	-1.39E-01	1.28E+01		1.99E+01		
		Mill Foreman - Tailings	6.55E-02	4.46E-03	5.43E-01		6.13E-01		
	Third Quarter	Mill Foreman - Mill	1.80E+01	7.95E-02	6.82E+00		2.49E+01		
		Mill Foreman - Tailings	2.43E-03	1.65E-04	2.01E-02		2.27E-02		
	Fourth Quarter	Mill Foreman - Mill	2.12E+00	7.87E-02	6.12E+00		8.31E+00		
		Mill Foreman - Tailings	0.00E+00	0.00E+00	0.00E+00		0.00E+00		
	Total		2.96E+01	3.61E-01	4.88E+01		8.70E+01		
	Second Quarter	Mill Laborer - 1 Mill	7.20E+00	-1.39E-01	1.28E+01		1.99E+01		
		Mill Laborer - 1 - Tailings	1.70E-02	1.16E-03	1.41E-01		1.59E-01		
	Third Quarter	Mill Laborer - 1 Mill	4.20E+01	1.86E-01	1.59E+01		5.81E+01		
		Mill Laborer - 1 - Tailings	3.40E-02	2.31E-03	2.82E-01		3.18E-01		
	Total		4.93E+01	4.95E-02	2.91E+01		7.85E+01		
	Third Quarter	Mill Laborer - 2 - Mill	3.00E+00	1.33E-02	1.14E+00		4.15E+00		
		Mill Laborer - 2 - Tailings	6.06E-03	4.13E-04	5.03E-02		5.68E-02		
	Fourth Quarter	Mill Laborer - 2 - Mill	4.65E+00	1.73E-01	1.35E+01		1.83E+01		
		Mill Laborer - 2 - Tailings	1.33E-02	9.05E-04	1.10E-01		1.25E-01		
	Total		7.68E+00	1.88E-01	1.48E+01		2.26E+01		
	First Quarter	Facility Supervisor - Mill	1.72E+00	1.66E-01	1.14E+01		1.33E+01		
		Facility Supervisor - Tailings	0.00E+00	0.00E+00	0.00E+00		0.00E+00		
	Second Quarter	Facility Supervisor - Mill	9.77E+00	-1.89E-01	1.74E+01		2.70E+01		
		Facility Supervisor - Tailings	6.06E-03	4.13E-04	5.03E-02		5.68E-02		
	Third Quarter	Facility Supervisor - Mill	3.90E+01	1.72E-01	1.48E+01		5.40E+01		
		Facility Supervisor - Tailings	4.73E-02	3.22E-03	3.92E-01		4.43E-01		
	Fourth Quarter	Facility Supervisor - Mill	5.62E+00	2.09E-01	1.62E+01		2.21E+01		
		Facility Supervisor - Tailings	1.35E-02	9.15E-04	1.12E-01		1.26E-01		
	Total		4.47E+01	3.85E-01	3.15E+01		7.66E+01		
Notes:		Maximum airborne concentrations for natural uranium, Radium-226 and Thorium-230 were used in the calculation for each area (mill, and tailings impoundment)							
		No worker could have received in excess of 10 percent of the applicable ALIs) in Table 1, Column 1 and 2 of Appendix B to 10 CFR 20.1001 - 20.2401 requiring monitoring of occupational intake.							

Kennecott Uranium Company
Sweetwater Uranium Project
Airborne Sampling Results: 2011
(Using Average Values)

Breathing Zone Samples - Annual Dose								
		Concentration				**Percent of DAC**		
		(Natural Uranium Only)	**Radium-226**	**Thorium-230**		**Natural Uranium**	**Radium-226**	**Thorium-230**
		(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**				
First	Mill Foreman	3.43E-13	4.99E-13	6.83E-13		1.72E+00	1.66E-01	1.14E+01
Second	Mill Foreman	8.23E-13	-2.39E-13	4.39E-13		4.12E+00	-7.97E-02	7.32E+00
Third	Mill Laborer - 1	4.81E-12	3.18E-13	5.46E-13		2.40E+01	1.06E-01	9.09E+00
Fourth	Mill Laborer -2	2.29E-13	2.76E-14	2.15E-13		1.14E+00	9.21E-03	3.58E+00
Please see attached spreadsheets								
Lower Limit of Detection (LLD) value used in average if result was non-detect.								

High Volume Air Sampling								
Date	**Location**	**Concentration**				**Percent of DAC**		
		Natural Uranium	**Radium-226**	**Thorium-230**		**Natural Uranium**	**Radium-226**	**Thorium-230**
		(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**				
Average for 2011	Mill Building	5.11E-15	1.27E-15	1.47E-15		2.56E-02	4.25E-04	2.44E-02
Average for 2011	Tailings Impoundment	1.36E-15	1.19E-15	3.49E-15		6.78E-03	3.97E-04	5.82E-02
	Average:	3.23E-15	1.23E-15	2.48E-15		1.62E-02	4.11E-04	1.67E-03
Please see attached spreadsheets								
Lower Limit of Detection (LLD) value used in average if result was non-detect.								

Measured Concentrations Used								
		Concentration				**Percent of DAC**		
		Natural Uranium	**Radium-226**	**Thorium-230**		**Natural Uranium**	**Radium-226**	**Thorium-230**
		(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**				
Mill First Quarter	Mill Foreman	3.43E-13	4.99E-13	6.83E-13		1.72E+00	1.66E-01	1.14E+01
Mill Second Quarter	Mill Foreman	8.23E-13	-2.39E-13	4.39E-13		4.12E+00	-7.97E-02	7.32E+00
Mill Third Quarter	Mill Laborer - 1	4.81E-12	3.18E-13	5.46E-13		2.40E+01	1.06E-01	9.09E+00
Mill Fourth Quarter	Mill Laborer -2	2.29E-13	2.76E-14	2.15E-13		1.14E+00	9.21E-03	3.58E+00
Tailings Impoundment		1.36E-15	1.19E-15	3.49E-15		6.78E-03	3.97E-04	5.82E-02

Exposure Calculations								
Hours Worked During 2011								
				Hours				
	First Quarter	Mill Foreman	Mill	100				
			Tailings Impoundment	60				
	Second Quarter	Mill Foreman	Mill	70				
			Tailings Impoundment	270				
	Third Quarter	Mill Foreman	Mill	30				
			Tailings Impoundment	10				
	Fourth Quarter	Mill Foreman	Mill	40				
			Tailings Impoundment	0				
	Total	Mill Foreman	Mill	240				
			Tailings Impoundment	340				
	First Quarter	Facility Supervisor	Mill	40				
			Tailings Impoundment	0				
	Second Quarter	Facility Supervisor	Mill	95				
			Tailings Impoundment	25				
	Third Quarter	Facility Supervisor	Mill	65				
			Tailings Impoundment	195				
	Fourth Quarter	Facility Supervisor	Mill	106				
			Tailings Impoundment	55				
	Total	Facility Supervisor	Mill	306				
			Tailings Impoundment	275				
	Second Quarter	Mill Laborer -1	Mill	70				
			Tailings Impoundment	70				
	Third Quarter	Mill Laborer -1	Mill	70				
			Tailings Impoundment	140				
	Total	Mill Laborer -1	Mill	140				
			Tailings Impoundment	210				
	Third Quarter	Mill Laborer -2	Mill	5				
			Tailings Impoundment	25				
	Fourth Quarter	Mill Laborer -2	Mill	88				
			Tailings Impoundment	55				
	Total	Mill Laborer -2	Mill	93				
			Tailings Impoundment	80				

Exposure			Natural Uranium (millirems)	Radium-226 (millirems)	Thorium-230 (millirems)		Total (millirems)	
	First Quarter	Mill Foreman - Mill	4.29E+00	4.15E-01	2.85E+01		3.32E+01	
		Mill Foreman - Tailings	1.02E-02	5.96E-04	8.73E-02		9.80E-02	
	Second Quarter	Mill Foreman - Mill	7.20E+00	-1.39E-01	1.28E+01		1.99E+01	
		Mill Foreman - Tailings	4.58E-02	2.68E-03	3.93E-01		4.41E-01	
	Third Quarter	Mill Foreman - Mill	1.80E+01	7.95E-02	6.82E+00		2.49E+01	
		Mill Foreman - Tailings	1.69E-03	9.93E-05	1.45E-02		1.63E-02	
	Fourth Quarter	Mill Foreman - Mill	1.14E+00	9.21E-03	3.58E+00		4.73E+00	
		Mill Foreman - Tailings	0.00E+00	0.00E+00	0.00E+00		0.00E+00	
	Total		3.07E+01	3.68E-01	5.22E+01		8.32E+01	
	Second Quarter	Mill Laborer - 1 - Mill	7.20E+00	-1.39E-01	1.28E+01		1.99E+01	
		Mill Laborer - 1 - Tailings	1.19E-02	6.95E-04	1.02E-01		1.14E-01	
	Third Quarter	Mill Laborer - 1 Mill	4.20E+01	1.86E-01	1.59E+01		5.81E+01	
		Mill Laborer - 1 - Tailings	2.37E-02	1.39E-03	2.04E-01		2.29E-01	
	Total		4.93E+01	4.82E-02	2.90E+01		7.83E+01	
	Third Quarter	Mill Laborer - 2 - Mill	3.00E+00	1.33E-02	1.14E+00		4.15E+00	
		Mill Laborer - 2 - Tailings	4.24E-03	2.48E-04	3.64E-02		4.08E-02	
	Fourth Quarter	Mill Laborer - 2 - Mill	2.51E+00	2.03E-02	7.87E+00		1.04E+01	
		Mill Laborer - 2 - Tailings	9.29E-03	5.44E-04	7.97E-02		8.96E-02	
	Total		5.53E+00	3.43E-02	9.12E+00		1.47E+01	
	First Quarter	Facility Supervisor - Mill	1.72E+00	1.66E-01	1.14E+01		1.33E+01	
		Facility Supervisor - Tailings	0.00E+00	0.00E+00	0.00E+00		0.00E+00	
	Second Quarter	Facility Supervisor - Mill	9.77E+00	-1.89E-01	1.74E+01		2.70E+01	
		Facility Supervisor - Tailings	4.24E-03	2.48E-04	3.64E-02		4.08E-02	
	Third Quarter	Facility Supervisor - Mill	3.90E+01	1.72E-01	1.48E+01		5.40E+01	
		Facility Supervisor - Tailings	3.30E-02	1.94E-03	2.84E-01		3.19E-01	
	Fourth Quarter	Facility Supervisor - Mill	3.03E+00	2.45E-02	9.50E+00		1.26E+01	
		Facility Supervisor - Tailings	9.40E-03	5.51E-04	8.07E-02		9.06E-02	
	Total		4.21E+01	1.99E-01	2.46E+01		6.69E+01	
Notes:	Average airborne concentrations for natural uranium, Radium-226 and Thorium-230 were used in the calculation for each area (mill, and tailings impoundment)							
	No worker could have received in excess of 10 percent of the applicable ALIs) in Table 1, Column 1 and 2 of Appendix B to 10 CFR 20.1001 - 20.2401 requiring monitoring of occupational intake.							

Kennecott Uranium Company
Sweetwater Uranium Project
Airborne Sampling Results: **2011**
(Using Maximum Values)

Breathing Zone Samples - Annual Intake									
Maximum for 2011	**Quarter**	**Exposed Individual**	**Concentration**				**Percent of DAC**		
			(Natural Uranium Only)	**Radium-226**	**Thorium-230**		**Natural Uranium**	**Radium-226**	**Thorium-230**
			(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**				
	First	Mill Foreman	3.43E-13	4.99E-13	6.83E-13		1.72E+00	1.66E-01	1.14E+01
	Second	Mill Foreman	8.23E-13	-2.39E-13	4.39E-13		4.12E+00	-7.97E-02	7.32E+00
	Third	Mill Laborer - 1	4.81E-12	3.18E-13	5.46E-13		2.40E+01	1.06E-01	9.09E+00
	Fourth	Mill Laborer -2	4.23E-13	2.36E-13	3.67E-13		2.12E+00	7.87E-02	6.12E+00
Please see attached spreadsheets									
Lower Limit of Detection (LLD) value used in average if result was non-detect.									
High Volume Air Sampling									
Date		**Location**	**Concentration**				**Percent of DAC**		
			Natural Uranium	**Radium-226**	**Thorium-230**		**Natural Uranium**	**Radium-226**	**Thorium-230**
			(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**				
Maximum for 2011		Mill Building	2.21E-14	2.68E-15	4.65E-15		1.11E-01	8.93E-04	7.75E-02
Maximum for 2011		Tailings Impoundment	1.94E-15	1.98E-15	4.83E-15		9.70E-03	6.60E-04	8.05E-02
		Maximum	2.21E-14	2.68E-15	4.83E-15		6.01E-02	7.77E-04	1.67E-03
Please see attached spreadsheets									
Lower Limit of Detection (LLD) value used in average if result was non-detect.									

Exposure Calculations									
Hours Worked During 2011				Hours					
	First Quarter	Mill Foreman	Mill	100.0					
			Tailings Impoundment	60.0					
	Second Quarter	Mill Foreman	Mill	70.0					
			Tailings Impoundment	270.0					
	Third Quarter	Mill Foreman	Mill	30.0					
			Tailings Impoundment	10.0					
	Fourth Quarter	Mill Foreman	Mill	40.0					
			Tailings Impoundment	0.0					
	Total	Mill Foreman	Mill	240.0					
			Tailings Impoundment	340.0					
	First Quarter	Facility Supervisor	Mill	40.0					
			Tailings Impoundment	0.0					
	Second Quarter	Facility Supervisor	Mill	95.0					
			Tailings Impoundment	25.0					
	Third Quarter	Facility Supervisor	Mill	65.0					
			Tailings Impoundment	195.0					
	Fourth Quarter	Facility Supervisor	Mill	106.2					
			Tailings Impoundment	55.5					
	Total	Facility Supervisor	Mill	306.2					
			Tailings Impoundment	275.5					
	Second Quarter	Mill Laborer -1	Mill	70.0					
			Tailings Impoundment	70.0					
	Third Quarter	Mill Laborer -1	Mill	70.0					
			Tailings Impoundment	140.0					
	Total	Mill Laborer -1	Mill	140.0					
			Tailings Impoundment	210.0					
	Third Quarter	Mill Laborer -2	Mill	5.0					
			Tailings Impoundment	25.0					
	Fourth Quarter	Mill Laborer -2	Mill	88.0					
			Tailings Impoundment	54.8					
	Total	Mill Laborer -2	Mill	93.0					
			Tailings Impoundment	79.8					

Annual Intake

Factors

Hours per working year:	2000	Hours	
Minutes per hour:	60	Minutes	
Breathing Rate:	2.00E+04	Milliliters per minute	
Allowable Limit of Intake - Natural Uranium:	5.00E-02	MicroCuries	(Year - Conservative)
Allowable Limit of Intake - Radium-226:	6.00E-01	MicroCuries	(Week)
Allowable Limit of Intake - Thorium-230:	2.00E-02	MicroCuries	(Year - Conservative)

Exposure			Natural Uranium (microCuries)	Radium-226 (microCuries)	Thorium-230 (microCuries)				
	First Quarter	Mill Foreman - Mill	4.12E-05	5.98E-05	8.20E-05				
		Mill Foreman - Tailings	1.40E-07	1.43E-07	3.48E-07				
	Second Quarter	Mill Foreman - Mill	6.91E-05	-2.01E-05	3.69E-05				
		Mill Foreman - Tailings	6.29E-07	6.42E-07	1.56E-06				
	Third Quarter	Mill Foreman - Mill	1.73E-04	1.14E-05	1.96E-05				
		Mill Foreman - Tailings	2.33E-08	2.38E-08	5.80E-08				
	Fourth Quarter	Mill Foreman - Mill	2.03E-05	1.13E-05	1.76E-05				
		Mill Foreman - Tailings	0.00E+00	0.00E+00	0.00E+00				
	Total		3.04E-04	6.33E-05	1.58E-04				
	Percent of Allowable Limit of Intake (ALI)		0.61	0.01	0.79				
	Second Quarter	Mill Laborer - 1 Mill	6.91E-05	-2.01E-05	3.69E-05				
		Mill Laborer - 1 - Tailings	1.63E-07	1.66E-07	4.06E-07				
	Third Quarter	Mill Laborer - 1 Mill	4.04E-04	2.67E-05	4.58E-05				
		Mill Laborer - 1 - Tailings	3.26E-07	3.33E-07	8.11E-07				
	Total		4.73E-04	7.13E-06	8.39E-05				
	Percent of Allowable Limit of Intake (ALI)		0.95	0.00	0.42				
	Third Quarter	Mill Laborer - 2 - Mill	2.88E-05	1.91E-06	3.27E-06				
		Mill Laborer - 2 - Tailings	5.82E-08	5.94E-08	1.45E-07				
	Fourth Quarter	Mill Laborer - 2 - Mill	4.47E-05	2.49E-05	3.88E-05				
		Mill Laborer - 2 - Tailings	1.28E-07	1.30E-07	3.18E-07				
	Total		7.37E-05	2.70E-05	4.25E-05				
	Percent of Allowable Limit of Intake (ALI)		0.15	0.00	0.21				
	First Quarter	Facility Supervisor - Mill	1.65E-05	2.39E-05	3.28E-05				
		Facility Supervisor - Tailings	0.00E+00	0.00E+00	0.00E+00				
	Second Quarter	Facility Supervisor - Mill	9.38E-05	-2.72E-05	5.00E-05				
		Facility Supervisor - Tailings	5.82E-08	5.94E-08	1.45E-07				
	Third Quarter	Facility Supervisor - Mill	3.75E-04	2.48E-05	4.25E-05				
		Facility Supervisor - Tailings	4.54E-07	4.63E-07	1.13E-06				
	Fourth Quarter	Facility Supervisor - Mill	5.39E-05	3.01E-05	4.68E-05				
		Facility Supervisor - Tailings	1.29E-07	1.32E-07	3.21E-07				
	Total		4.29E-04	5.55E-05	9.08E-05				
	Percent of Allowable Limit of Intake (ALI)		0.86	0.01	0.45				
	Notes:	Maximum airborne concentrations for natural uranium, Radium-226 and Thorium-230 were used in the calculation for each area (mill, and tailings impoundment)							
		No worker could have received in excess of 10 percent of the applicable ALIs) in Table 1, Column 1 and 2 of Appendix B to 10 CFR 20.1001 - 20.2401 requiring monitoring of occupational intake.							

Maximum Weekly and Annual Intake of Soluble Uranium

Basis of Calculation:

The derived air concentration (DAC) values are derived limits intended to control chronic occupational exposures. The relationship between the DAC and the ALI is given by: DAC=ALI(in µCi)/(2000 hours per working year x 60 minutes/hour x 2 x 104 ml per minute)=[ALI/2.4x109] µCi/ml, where 2x104 ml is the volume of air breathed per minute at work by "Reference Man" under working conditions of "light work." - **10 CFR 20 Appendix B**

Maximum Weekly Intake of Soluble Uranium

Maximum Number of Working Hours in a Week:	40	**Hours**
Maximum Measured Airborne Natural Uranium Concentration in Air:	4.805E-12	**MicroCuries per Milliliter)**
Hours per Working Year:	2000	**Hours**
Miunutes per hour	60	**minutes**
Volume of Air Breathed:	2.00E+04	**Milliliters per minute**
Activity of Natural Uranium Inhaled:	2.31E-04	**microCuries**
	230.64	**picocuries**
Activity/Mass Relationship - Natural Uranium:	677	**picoCuries per milligram**
Maximum intake of soluble uranium in a forty (40) hour week:	0.34	**milligrams**

Maximum Annual Intake of Soluble Uranium

Maximum Number of Hours Worked in the Mill and Solvent Extraction (SX) Buildings in 2011	306.2	
Maximum Measured Airborne Natural Uranium Concentration in Air:	4.805E-12	**MicroCuries per Milliliter)**
Hours per Working Year:	2000	**Hours**
Miunutes per hour	60	**minutes**
Volume of Air Breathed:	2.00E+04	**Milliliters per minute**
Activity of Natural Uranium Inhaled:	1.77E-03	**microCuries**
	1765.65	**picocuries**
Activity/Mass Relationship - Natural Uranium:	677	**picoCuries per milligram**
Maximum intake of soluble uranium in one (1) year:	2.61	**milligrams**

Both values are below the ten (10) milligram weekly intake limit for soluble uranium.

Maximum Possible Airborne Exposure at the Sweetwater Uranium Project

This table calculates the absolute maximum possible exposure to airborne particulates at the Sweetwater Uranium Project by:

1 Using the maximum number of hours spent by any site worker in the Mill and Solvent Extraction (SX) Buildings and the tailings impoundment
2 Using the maximum airborne concentration result for 2011 for natural uranium, Radium-226 and Thorium-230

3 Maximum time spent in the Mill and Solvent Extraction (SX) Buildings and the tailings impoundment by any individual:

Worker: Facility Supervisor (Mill and Solvent Extraction (SX) Buildings)/Mill Foreman (Tailings)

Time:

Mill and Solvent Extraction (SX) Buildings: 306.2 Facility Supervisor

Tailings Impoundment: 340.0 Mill Foreman

Maximum for 2011	**Concentration**				**Percent of DAC**		
	(Natural Uranium)	**Radium-226**	**Thorium-230**		**Natural Uranium**	**Radium-226**	**Thorium-230**
	(microCuries/ml)	**(microCuries/ml)**	**(microCuries/ml)**				
Mill and Solvent Extraction (SX) Buildings	4.81E-12	4.99E-13	6.83E-13		2.40E+01	1.66E-01	1.14E+01
Tailings	1.94E-15	1.98E-15	4.83E-15		9.70E-03	6.60E-04	8.05E-02

Annual Dose

		(Natural Uranium)	**Radium-226**	**Thorium-230**	**Total**
		(millirems)	**(millirems)**	**(millirems)**	**(millirems)**
Total - Annual	Facility Supervisor - Mill	1.84E+02	1.27E+00	8.71E+01	2.72E+02
	Mill Foreman - Tailings	8.25E-02	5.61E-03	6.84E-01	7.72E-01

Total: 184.0 1.3 87.8 273.1
The total dose does not exceed 10% of the dose limit of 5,000 millirems (one (1) Allowable Limit of Intake (ALI))

Maximum Annual Intake

1 Using the maximum number of hours spent by any site worker in the Mill and Solvent Extraction (SX) Buildings and the tailings impoundment
2 Using the maximum airborne concentration result for 2011 for natural uranium, Radium-226 and Thorium-230

3 Maximum time spent in the Mill and Solvent Extraction (SX) Buildings and the tailings impoundment by any individual:

Worker: Facility Supervisor (Mill and Solvent Extraction (SX) Buildings)/Mill Foreman (Tailings)

Time:

Mill and Solvent Extraction (SX) Buildings: 306.2 Facility Supervisor

Tailings Impoundment: 340.0 Mill Foreman

4 Other Factors

Hours per working year:	2000 Hours	
Minutes per hour:	60 Minutes	
Breathing Rate:	2.00E+04 Milliliters per minute	
Allowable Limit of Intake - Natural Uranium:	5.00E-02 MicroCuries	(Year - Conservative)
Allowable Limit of Intake - Radium-226:	6.00E-01 MicroCuries	(Week)
Allowable Limit of Intake - Thorium-230:	2.00E-02 MicroCuries	(Year - Conservative)

		(Natural Uranium)	**Radium-226**	**Thorium-230**
		(microCuries)	**(microCuries)**	**(microCuries)**
Total - Annual	Facility Supervisor - Mill	1.77E-03	1.83E-04	2.51E-04
	Mill Foreman - Tailings	7.92E-07	8.08E-07	1.97E-06
Total:		1.77E-03	1.84E-04	2.53E-04
Percent of Allowable Limit of Intake (ALI)		3.5	0.03	1.3

Note: Assuming that the individual with the greatest time in the Mill and Solvent Extraction (SX) Buildings and tailings impoundment was exposed to the single highest measured natural uranium, Radium-226 and Thorium-230 concentrations, he still did not exceed 10% of the annual dose limit so monitoring for internal doses was not required.

Rio Tinto

Internal memo

20 February 2012

To: NRC File

Subject: Bioassay Assessment

A review of the monthly urinalysis sample results for the Mill Foreman, Senior Facility Technician, Facility Supervisor and urine analysis sample results of contract and other site employees working in 2011 shows that all results are below the first action level of 15 µg/L. In fact, all urinalysis results for the year 2011 were less than the lower limit of detection (LLD) of 5.0 µg/liter.

Site employees were bioassayed monthly. Contract employees working on site who could potentially contact uranium were bioassayed prior to the commencement of work and monthly while working on the site. If an employee ceased to work on the site, a final bioassay was collected, if at all possible. Contract employees who did not work on site during a given month were not bioassayed during that month. Bioassaying of those employees was restarted when they returned to work on site.

A contract Mill Laborer working for a contract employment agency did not provide a final bioassay. The employee provided a monthly bioassay for August 2011 on August 8, 2011. He failed to report for work on the morning of Monday, August 29, 2011. The contract employment agency was provided with a bioassay sample bottle and mailer with which to return the filled sample bottle. They were unable to contact or locate him and reported that “his phone numbers are disconnected”. This was discussed with James Webb and Linda Gersey of the Nuclear Regulatory Commission during a routine inspection on September 13 to 14, 2011. They advised that any relevant correspondence (emails, etc.) related to this incident be retained.

The Security Guards were tested monthly in spite of the fact that they did not work in the restricted area in 2011. The site Administrative Coordinator and contract Administrative Assistant were also tested in spite of the fact that they did not work in the restricted area and worked solely in the office.

Please see attached summary of 2011 urinalysis data.

Oscar A Paulson

Oscar A. Paulson

Facility Supervisor

KENNECOTT URANIUM COMPANY

SWEETWATER URANIUM PROJECT

BIOASSAY TESTING

2011

EMPLOYEE TITLE		EMPLOYER	January	February	March	April	May	June	July	August	September	October	November	December	LLD
Facility Supervisor	FS	Kennecott Uranium Company	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**5.0**
Mill Foreman	MF	Kennecott Uranium Company	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<0.5				<5.0		**5.0**
Senior Facility Technician	FT	Kennecott Uranium Company	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**5.0**
Administrative Coordinator [1]	AC	Kennecott Uranium Company	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	<5.0 [1]	**5.0**
CONTRACT EMPLOYEE TITLE		**EMPLOYER**													
Administrative Assistant [1]	DATA	Adecco USA, Inc.	<5.0 [1]												**5.0**
Mill Laborer	MILL	Adecco USA, Inc.					<5.0	<5.0	<5.0	<5.0					**5.0**
Security	SEC # 1	Securitas Security	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**5.0**
Security	SEC # 4	Securitas Security	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**5.0**
Surveyor	SURV	W L C							<5.0	<5.0					**5.0**
Electrician	ELEC	L&L Electric							<5.0	<5.0			<5.0		**5.0**
Tailings Inspector	TAIL	Telesto Solutions, Inc.						<5.0							**5.0**
Tailings Repair Worker	ACI#1	Archer Construction, Inc.							<5.0						
Tailings Repair Worker	ACI#2	Archer Construction, Inc.							<5.0	<5.0					**5.0**
Tailings Repair Worker	ACI#3	Archer Construction, Inc.							<5.0	<5.0					**5.0**
Tailings Repair Worker	ACI#4	Archer Construction, Inc.							<5.0	<5.0		<5.0			**5.0**
Tailings Repair Worker	ACI#5	Archer Construction, Inc.								<5.0		<5.0			**5.0**
Crane Repair Worker	CRN	American Equipment, Inc.								<5.0					**5.0**
Fire Extinguisher Inspector	GRN	Simplex Grinnell								<5.0					**5.0**

All samples tested by: ENERGY LABORATORIES, INC.
All samples below first action level.
A high, low and blank spike sent with each batch.

Notes:

Pre-job bioassays were collected on new personnel and final bioassays were collected on personnel leaving the job site.
Contract security guards were tested when on site in spite of the fact that they did not enter the restricted area.

Was not on site for this month.

[1] Did not work in restricted area in 2010 / worked solely in office.
Administrative coordinator and contract administrative assistant were tested in spite of the fact that they worked solely in the office.

Pre-job bioassay.
Final bioassay
Pre-job and post job bioassay collected in same month.
Pre-job bioassay. Never worked on site.

Rio Tinto

Internal memo

20 February 2012

To: NRC File

Subject: Summary of Radiation Instrument Calibrations – 2011

Instrument		Date(s) Calibrated
Calibration Orifices (Annual calibration required)		
	Lo Vol-40A S/N M100	2/10/11
	Hi Vol-25A S/N 8080978	2/10/11
	Sierra Instruments TE-5025A	2/10/11
Calibrators (Annual calibration required)		
	CD-530-1 Digital Venturi Calibrator S/N 3039	2/17/11
Alpha Detectors		
	43-5 S/N P-2425	1/19/11, 8/11/11
	43-5 S/N P-2426	1/5/11, 6/27/11
	43-5 S/N P-2427	1/6/11, 6/27/11
	43-5 S/N P-2428	1/6/11, 6/27/11
	43-5 S/N P-2429	1/19/11, 8/11/11
	43-90 S/N PR-138872	1/19/11, 8/11/11
	43-90 S/N PR-138874	1/20/11, 8/11/11
	43-90 S/N 232499	1/5/11, 6/27/11
	43-1 S/N PR-206925	4/16/11, 11/9/11
	AC3-5 S/N 3793	4/8/11, 11/9/11
Gamma Meters/Detectors		
	12S S/N 11816	4/4/11, 11/11/11
	5 S/N 8170	4/4/11, 11/10/11
	44-10 S/N 206932	4/6/11, 11/10/11
	44-10 S/N 233869	4/5/11, 11/9/11
	19 S/N 16938	4/4/11, 11/11/11
	44-10 S/N 252103	4/5/11, 11/10/11
	44-10 S/N 252068	1/4/11, 7/12/11
Rate Meters		
	177 S/N 14390	1/19/11, 8/10/11
	177 S/N 14407	1/5/11, 6/27/11
	2350-1 S/N 192613	4/5/11, 11/7/11
	2350-1 S/N 216182	4/5/11, 11/7/11
	2350-1 S/N 235547	1/4/11, 7/12/11
	2350-1 S/N 235565	4/5/11, 11/7/11
	Model 3 S/N 157539	1/15/11, 7/20/11
	Model 12 S/N 12280	4/1/11, 11/7/11
	PRS-1 S/N 330/3793	4/8/11, 11/9/11

SAC R4		
	S/N 383	1/14/11, 7/19/11
SAC R5		
	S/N 614	1/13/11, 7/18/11
	S/N 965	1/4/11, 6/29/11
	S/N 602548	1/4/11, 6/28/11
Scaler		
	MS-2 S/N 738	1/4/11, 6/28/11
	MS-2 S/N 994	1/13/11, 7/18/11
Beta Gamma Detector		
	Model 44-1 S/N PR-156890	4/1/11, 11/7/11
	Model 44-9 S/N PR-093335	1/17/11, 7/20/11
	Model 44-142 S/N PR-302659 (New instrument acquired on May 19, 2011)	5/16/11, 6/15/11, 1/31/12
Air Pumps		
	Buck Basic S/N 12527	Used for personal breathing zone sampling and for radon progeny sampling. Please see attached sheet
	Buck Basic 12 S/N 12486	
	Buck Basic 12 S/N 12494	
Scintillation Detector		
	Model SPA-1 S/N 704727	1/4/11, 6/28/11
Hi Vol Air Sampler		
	S/N Unit # 1[1]	1/18/11, 4/5/11, 7/14/11, 10/4/11, 12/29/11
	S/N Unit # 2	1/18/11, 4/5/11, 7/14/11, 10/4/11
	S/N Unit # 3	1/18/11, 4/5/11, 7/14/11, 10/4/11
	S/N Unit # 4	1/18/11, 4/5/11, 7/14/11, 10/4/11
	S/N 11314 (New instrument acquired on November 14, 2011)	11/8/11, 12/29/11
Lo Vol Air Sampler (Graseby)		
	Unit #2	Removed from service in 2010. [2]
Lo Vol Air Sampler (F & J Specialties)		
	DF-604 S/N 10016	Annual Factory calibration: January 26, 2011. Field calibration/checks: 11/7/11, 12/5/11
	DF-604 S/N 8917	Annual Factory calibration: November 17, 2011. Field Calibration/checks: 1/17, 2/7, 3/7, 4/4, 5/2, 6/6, 7/1, 8/1, 9/6 and 10/3/11.

Lo Vol Air Sampler In-Service Dates:
One unit is required to be operating at the single required downwind air monitoring station during non-operating periods. The F&J Specialties DF-604 unit with serial number 10016 operated from January 1 to January 10, 2011 and November 7 to December 31, 2011. The DF-604 unit with serial number 8917 operated from January 10 to November 7, 2011.

Note: Portable electronic survey instruments calibrated by a contract laboratory (Energy Laboratories, Inc.) in accordance with ANSI Standard N323A-1997 – American National Standard – Radiation Protection Instrumentation – Test and Calibration, Portable Survey Instruments.

Orifices are calibrated annually as stated in the Environmental Protection Agency Quality Assurance Handbook for Air Pollution Measurement Systems - Volume II – Ambient Air Specific Methods. Calibrators are calibrated annually, as per the manufacturer.

No electronic survey instrument was used on site unless that instrument had been calibrated within the last six (6) months prior to use. Instruments were sent to the off-site calibrator following six (6) months of last calibration. The off-site calibrator has experienced severe delays in calibrating and returning instruments to the site in the past. They have since hired another technician and turnaround time has improved, though delays occur periodically.

[1]Motor failed on this unit. Motor was replaced and unit recalibrated on December 29, 2011.

[2] Not required as a standby unit since site has two DF-604 units (serial numbers 8917 and 10016). One is in use and the second is on standby in the event the operating unit fails. A spare plenum and motor are kept on site as well.

To insure a high level of accuracy of breathing zone sample volumes, these units were calibrated between each sample event, on the following dates/times:

Buck Basic 12 – S/N B12527

Date	Time
1/8/11	16:50
4/6/11	9:52
7/7/11	16:03
10/4/11	10:28

Buck Basic 12 – S/N B12494

Date	Time
1/8/11	16:35
3/17/11	16:05
4/6/11	9:37
6/2/11	9:13
6/30/11	16:26
7/7/11	15:55
8/23/11	10:43
8/23/11	13:43
10/4/11	14:27
11/1/11	8:34
11/2/11	10:22
11/14/11	8:32
11/15/11	13:19
11/29/11	13:49
11/29/11	17:25
11/30/11	14:36
11/30/11	17:46
12/1/11	11:23
12/1/11	16:04
12/5/11	14:40
12/5/11	15:42

Buck Basic 12 – S/N B12486

Date	Time
1/18/11	16:44
4/6/11	9:45
6/6/11	14:24
6/8/11	12:29
7/7/11	15:42
10/4/11	15:42
11/2/11	9:12
11/3/11	8:10
12/1/11	9:08
12/11/11	15:55

Oscar Paulson
Facility Supervisor

Rio Tinto

Internal memo

20 February 2012

TO: Gamma Radiation Monitoring File

Subject: External Gamma Radiation Survey Assessment

In 2011, gamma surveys of the Mill were conducted on June 14 and December 7 and 13, 2011. Gamma surveys of the interior of the tailings impoundment were conducted on June 15 and November 22, 2011. Gamma surveys of the Ion Exchange area were conducted on June 14 and 15 and December 7, 13 and 29, 2011.

Eighteen (18) areas or items associated with the Ion Exchange equipment were surveyed on June 14 and 15 and December 7, 13 and 29, 2011. Thirty (30) locations in the Mill and Solvent Extraction (SX) Buildings were surveyed for gamma radiation in June 2011 and December 2011.

Average gamma readings for discrete items or areas ranged from 31 to 465 µR/hour (190 µR/hr average for the year) for the Ion Exchange areas and related equipment, to 12 to 704 µR/hour (76 µR/hr average for the year) in the Mill and Solvent Extraction (SX) Buildings.

The stored equipment was monitored as well on June 14, 15 and December 13 and 29, 2011. Average gamma readings for discrete items of stored equipment ranged from 10.2 to 6371 µR/hr at the equipment surface. These readings were taken directly on the equipment surface. The stored equipment generally exhibited higher gamma readings than the existing mill equipment, with the overall effect of slightly increasing gamma doses in the mill in areas where the equipment is stored.

None of the stored equipment exhibited dose rates at thirty (30) centimeters from the equipment (greater than 0.005 rems) sufficient to require posting under 10 CFR 20.1003 as a radiation area. The highest average reading encountered at thirty (30) centimeters from any piece of equipment was 2.92 mR/hr (0.003 R/hr). Employees and contract personnel have been instructed to avoid certain pieces of stored equipment (pressure vessels) in the mill that exhibit the highest levels of gamma radiation. The area in which the pressure vessels are stored in the mill has been identified. These vessels are checked periodically to insure that gamma levels thirty (30) centimeters from the surface do not exceed 5.00 mR/Hr (0.005 R/hr) and that they do not require signing as a Radiation Area.

Two gamma surveys were completed in the tailings impoundment on June 15 and November 22, 2011. This area averaged 103.5 µR/hr for 2011. Due to the large number of readings taken in the impoundment on June 15 and November 22, 2011, the tables with all of the readings are not included. Over 400 readings were taken in the impoundment each time.

Gamma radiation levels from the stored resin in the thickener in the Counter Current Decantation (CCD) area of the mill are tracked. The levels remain low. The results of the monitoring are included on the attached table entitled “Stored Resin Gamma Radiation Monitoring Results”.

In spite of the fact that personal monitoring of dose at the site is not required due to the demonstrated low doses to individuals, personal external dosimeters were issued to site and contract personnel. The maximum annual external deep dose above background received by any site Luxel dosimeter was 4 millirems. A summary of the dosimetry results is attached.

An assessment of dose (external and internal) to the maximally exposed individual (the Mill Foreman) demonstrating the lack of need for individual monitoring under 10 CFR 20.1502 is maintained on file on site.

Oscar A Paulson

Oscar Paulson

Kennecott Uranium Company
Sweetwater Uranium Project
Stored Resin

Stored Resin Gamma Radiation Monitoring Results

Date	Gamma	
	Top (uR/hr)	Bottom (uR/hr)
28-Apr-98	25	60
8-Oct-98	22	160
12-May-99	19	60
17-Nov-99	45	90
21-May-00	30	70
21-Dec-00	40	70
20-Jun-01	40	65
26-Dec-01	90	80
24-Jun-02	60	80
23-Dec-02	14	60
25-Jun-03	20	60
16-Dec-03	41.8	71.7
28-Jun-04	57.8	152
16-Dec-04	28.7	110
8-Jun-05	18	120
22-Dec-05	53.4	262
14-Jun-06	32.7	125
21-Dec-06	50.1	117
26-Jun-07	25.1	111
13-Dec-07	24.9	133
24-Jun-08	27.3	24.3
23-Dec-08	52.6	71.2
23-Jun-09	37.6	78.3
24-Nov-09	43.8	71.9
14-Jun-10	34	74
2-Dec-10	19	179
14-Jun-11	22	82
7-Dec-11	21	133
Average	35.5	98.9
Standard Deviatior	16.9	48.1

OAP:2004
resin0001.xls

KENNECOTT URANIUM COMPANY

Sweetwater Uranium Project

OCCUPATIONAL RADIATION DOSIMETRY RESULTS / DEEP DOSE

2011

EMPLOYEE TITLE	CODE	BADGE	EMPLOYER	January	February	March	April	May	June	July	August	September	October	November	December	Total
FACILITY SUPERVISOR	FS	24	KENNECOTT URANIUM CO.	M	M	M	M	M	M	M	M	M	M	M	M	0
MILL FORMAN	MF	26	KENNECOTT URANIUM CO.	M	M	M	M	M	M	M	M					0
SR. FACILITY TECHNICIAN	FT	27	KENNECOTT URANIUM CO.	M	M	M	M	M	M	M	M	M	M	M	M	0
ADMINISTRATIVE COORDINATOR	AC	25	KENNECOTT URANIUM CO.	M	M	M	M	M	M	M	M	M	M	M	M	0
CONTRACT EMPLOYEE																
TITLE			**EMPLOYER**													
ADMINISTRATIVE ASSISTANT	AST	75	ADECCO USA INC.	M	M	M	M	M	M	M	M	M	M	M	M	0
SECURITY	SEC # 1	49	SECURITAS	M	M	M	M	1	M	M	2	1	M	M	M	4
SECURITY	SEC # 4	88	SECURITAS	M	M	1	M	M	M	M	M	3	M	M	M	4
SURVEYOR	SURV	28	WLC INC.	M	M	M	M	M	M	M	M	M	M	M	M	0
MILL LABORER	MLB	89	ADECCO USA INC.					M	M	M	M	1	M			1
TAILINGS REPAIR WORKER	ACI#1	95	ARCHER CONSTRUCTION, INC.								1	M	M	M	M	1
TAILINGS REPAIR WORKER	ACI#2	92	ARCHER CONSTRUCTION, INC.								M	M	M	M	M	0
TAILINGS REPAIR WORKER	ACI#3	90	ARCHER CONSTRUCTION, INC.								1	M	M	M	M	1
TAILINGS REPAIR WORKER	ACI#4	91	ARCHER CONSTRUCTION, INC.								M	M	M	1	M	1
TAILINGS REPAIR WORKER	ACI#6	93	ARCHER CONSTRUCTION, INC.								M	M				0
TAILINGS REPAIR WORKER	ACI#7	94	ARCHER CONSTRUCTION, INC.								M	M	M	M	M	0
VISITOR BADGE	D-1	35		M	M	M	M	M	M	M	M	1	M	M	M	1
VISITOR # 1BADGE	D-2	36		M	M	M	M	M	M	M	M	M	M	M	M	0
VISITOR # 3 BADGE	D-3	33		M	M	M	M	M	M	M	1	M	M	M	M	1
CRANE REPAIR WORKER	CRN # 1		AMERICAN EQUIPMENT, INC.								M / D-1					
FIRE EXTINGUISHER INSPECTOR	GRN		SIMPLEX GRINNELL								1/D-3					
ELECTRICIAN	ELEC		L&L ELECTRIC							M/D-1	M/D-1			M/D-1		
TAILINGS INSPECTOR	TAIL		TELESTO SOLUTIONS, INC.						M/D-1							

Employees listed by title (number) to preserve confidentiality

Not on site during month

Dosimeter lost/Dose estimated by Landauer, Inc.

Did not work on site.

Did not work in restricted area.

M = Minimal reporting service of 1 MREM

D-1 - Issued Visitor Dosimeter Badge

D-2 - Issued Visitor-1 Dosimeter Badge

D-3 - Issued Visitor-3 Dosimeter Badge

NOTE: Workers new to the site were issued a visitor dosimeter until their assigned/permanent dosimeter arrived from Landauer, Inc.

All exposures are less than 10% of the limits in 10 CFR 20.1502 and as such monitoring and reporting of doses is not required.

This individual tracking of doses using dosimeters exchanged on a monthly basis is being performed to insure that external doses are indeed being maintained ALARA

Rio Tinto

Internal memo

21 February 2012

To: Total and Removable Alpha Monitoring File

Subject: Total and Removable Alpha Monitoring Assessment

In 2011 removable alpha monitoring was performed in the Mill and Solvent Extraction (SX) Buildings on June 8 and December 20, 2011 and in the Ion Exchange area on June 8 and December 5, 2011. Total alpha monitoring was performed on June 21, 22 and December 27 and 28, 2011 in the Mill and SX buildings and on June 20 and December 27, 2011 in the Ion Exchange area.

Total and removable alpha monitoring was performed at least four (4) locations related to the Ion Exchange plant and at least nineteen (19) locations related to the Mill and Administration Buildings.

Total average alpha contamination levels in the Mill Building ranged between 108.6 and 58,616 dpm/100 cm^2. The single high reading was taken at the southeast corner of the centrifuge support frame in the Yellowcake Area of the Mill Building. This area is part of the restricted area. Removable alpha contamination in the Mill Building ranged from 1.6 to 725.9 dpm/100 cm^2. The single high removable alpha measurement was taken on June 8, 2011 of the southeast corner of the centrifuge support frame in the yellowcake area of the Mill Building. This item is within the restricted area. Most of the alpha contamination on the centrifuge support frame is fixed in place and non-mobile. The removable contamination on the support frame varied from 49.1 to 725.9 dpm/100 $cm^{2.}$ The contamination on the centrifuge frame appears to be fixed to the zinc coating on the galvanized steel support frame.

Total average alpha contamination levels in the Ion Exchange area ranged from 44.1 to 1974.8 dpm/100 cm^2. This single high reading was on the elution pump skid. The Ion Exchange area is a restricted area. Removable alpha contamination levels in the Ion Exchange area ranged from 2.0 to 17.4 dpm/100 cm^2. Both the high total and removable alpha readings are below the limits (5000/1000 dpm/100 cm^2) for release for unrestricted use.

Total alpha monitoring of the stored equipment was performed on June 21, 22, December 28 and 29, 2011. Removable alpha monitoring of the stored equipment was performed on June 13 and December 20, 2011, as well. Total alpha readings on the equipment ranged from 17.4 to 73,729 dpm/100 cm^2. Removable alpha readings for the stored equipment ranged from 0.1 to 75,245.1 dpm/100 cm^2. The high total and removable alpha readings were from rubber liner material on the inside of connecting pipes welded onto stored pressure vessels 70 and 71. These vessels, along with some others, are stored in the tailings impoundment to isolate them. It is planned to cap these connecting pipes in 2012.

Nuclear Regulatory Commission (NRC) regulations provide no specific limit on surface contamination levels in the restricted areas. This vessel is stored in the tailings impoundment, a restricted area.

Regulatory Guide 8.30 *Health Physics Surveys in Uranium Recovery Facilities* states in section 2.5:

> ***2.5 Surveys for Surface Contamination in Restricted Area***
>
> *NRC regulations provide no specific limit on surface contamination levels in restricted areas. However, yellowcake or ore dust lying on surfaces can become resuspended and contribute to the intake of radionuclides, which is limited by 10 CFR 20.1204.*
>
> *In ore handling areas, surface contamination is not a problem because of the very low specific activity of the ore. In fact, cleanup attempts by methods such as sweeping are likely to produce a more serious hazard through resuspension in the air than if the ore dust were allowed to remain*

where it lies. When necessary, cleanup may be performed by hosing down the ore dust into floor sumps or by using vacuum suction systems with filtered exhausts.

In leaching and chemical separation areas there is usually little dust and little difficulty with surface contamination.

In the precipitation circuit and the yellowcake drying and barreling areas, surface contamination can be a problem because of the concentrated nature of the yellowcake. The International Atomic Energy Agency (IAEA) recommends (Ref.2) a limit for alpha contamination on such areas as walls, floors, benches, and clothing of 10-³ μ Ci/cm2 (220,000 dpm/100 cm2), which is equivalent to about 2 mg/cm2 of natural uranium. Based on experience, the IAEA concluded that if surface contamination levels are kept below this value, the contribution to airborne radioactivity from surface contamination will be well below applicable limits. The British National Radiological Protection Board also recommends a limit of 10-³ μ Ci/cm2 for uranium alpha contamination in active areas of plants (Ref.22), based on calculation using resuspension factors rather than experience.

The NRC staff considers surface contamination levels of 10-³ μ Ci/cm2 acceptable to meet the ALARA concept in UR facilities. The levels are low enough to ensure little contribution to airborne radioactivity, yet are practical to meet. Such an amount of yellowcake surface contamination is readily visible because of the low specific activity of uranium and does not require a survey instrument for detection. It is recommended that surfaces where yellowcake may accumulate be painted in contrasting colors because surveys for surface contamination in work areas are visual rather than by instrument.

The elevated total and removable alpha readings fall below the 220, 000 dpm/100 cm^2 threshold.

Oscar A Paulson

Oscar A. Paulson

Rio Tinto

Internal memo

20 February 2012

To: Radon Monitoring File

Subject: Radon Daughter Monitoring Assessment

In 2011 radon daughter monitoring was conducted on June 6 and November 29, 2011 in the Ion Exchange Area. Radon daughter monitoring was conducted in the Mill Building on June 7 and November 30 to December 1, 2011.

At least twelve (12) locations throughout the Mill and three (3) locations around the IX were sampled for radon daughters. In addition, locations in the Security Trailer and Administration Building were sampled for radon daughters as well. Radon daughter concentrations (in working levels) were at low levels, ranging from 0.001 to 0.003 WL in the Ion Exchange area (average: 0.002) and 0.003 to 0.022 WL in the Mill and Solvent Extraction (SX) Buildings (average: 0.009). The ventilation fan operated continuously in the Solvent Extraction (SX) Building. Radon levels varied in the SX building from 0.012 to 0.026 WL, averaging 0.026 WL in June 2011 and 0.017 WL in December 2011. Radon concentrations have not exceeded the 0.08 WL thresholds in the SX Building which would require weekly monitoring. The fan continues to be effective in controlling radon daughter concentrations.

Radon daughter concentrations were measured in June and December 2011 in the Security Trailer to assist in determining an equilibrium factor for the area, for use in calculating dose to the nearest resident.

Radon daughters were sampled and analyzed using the modified Kusnetz method.

Two (2) RadTrak radon monitors were placed above and beneath the Number 1 Counter-Current Decantation (CCD) tank in the Mill during all four quarters of 2011 to monitor radon levels associated with the used ion exchange resin stored in the Number 1 CCD tank. Radon concentrations below the tank varied from 1.6 to 2.8 pCi/L. Radon concentrations on top of the tank varied from 1.3 to 2.6 pCi/L. These values are at background levels since upwind radon concentrations for the facility varied from 1.7 to 3.3 pCi/L during 2011, as shown in the table below:

2011 Radon Concentrations

Quarter	Bottom of CCD#1 (pCi/L)	Top of CCD#1 (pCi/L)	Upwind (Background) (pCi/L)
1st	1.7	1.7	0.9[2]
2nd	1.6	1.3	1.8[2]
3rd	2.7	2.4	3.3[2]
4th	2.8	2.6	3.1[2]
Average	2.2	2.0	2.3

[2] Average of two (2) Rad Trak units.

Radon daughter concentrations at the top and bottom of CCD#1 were low, ranging from 0.001 to 0.022 WL.

A history of the RadTrak results and the radon daughter sampling results is included on the attached tables entitled “Stored Resin RadTrak Monitoring Results” and “Stored Resin Radon Monitoring Results”.

Oscar A Paulson

Oscar Paulson

Kennecott Uranium Company
Sweetwater Uranium Project
Stored Resin

Stored Resin Radon Monitoring Results

Date	Radon	
	Top (WL)	Bottom (WL)
24-Nov-98	0.028	0.023
19-May-99	0.037	0.020
12-Oct-99	0.040	0.057
26-Apr-00	0.008	0.005
21-Nov-00	0.030	0.023
15-May-01	0.027	0.027
10-Dec-01	0.024	0.023
16-Jun-02	0.013	0.012
25-Nov-02	0.027	0.028
2-Jun-03	0.013	0.011
30-Nov-03	0.012	0.007
30-Jun-04	0.010	0.013
2-Dec-04	0.011	0.027
21-Jun-05	0.028	0.016
1-Dec-05	0.022	0.025
12-Jun-06	0.002	0.000
19-Dec-06	0.043	0.043
24-Jun-07	0.005	0.012
10-Dec-07	0.021	0.012
10-Jun-08	0.022	0.027
9-Dec-08	0.009	0.007
2-Jun-09	0.003	0.006
9-Dec-09	0.008	0.008
19-May-10	0.013	0.014
1-Dec-10	0.006	0.008
7-Jun-11	0.003	0.001
30-Nov-11	0.022	0.021
Average	0.018	0.018
Standard Deviation:	0.012	0.013

OAP:
resin0001.xls

Kennecott Uranium Company
Sweetwater Uranium Project
Stored Resin

Stored Resin RadTrak Monitoring Results

Date	RadTrak Results	
	Top (pCi/l)	Bottom (pCi/l)
2ND Quarter 1998	1.9	2.0
3RD Quarter 1998	2.3	2.1
4TH Quarter 1998	1.7	1.8
1ST Quarter 1999	3.3	3.3
2ND Quarter 1999	2.3	2.5
3RD Quarter 1999	2.3	2.9
4TH Quarter 1999	4.8	4.5
1ST Quarter 2000	2.7	2.7
2ND Quarter 2000	2.2	3.3
3RD Quarter 2000	2.8	3.2
4TH Quarter 2000	3.9	4.7
1ST Quarter 2001	2.9	5.2
2ND Quarter 2001	1.0	1.5
3RD Quarter 2001	2.0	2.5
4TH Quarter 2001	2.5	3.4
1ST Quarter 2002	2.8	2.6
2ND Quarter 2002	1.8	2.2
3RD Quarter 2002	2.9	2.3
4TH Quarter 2002	2.7	4.7
1ST Quarter 2003	2.5	2.8
2ND Quarter 2003	2.0	3.2
4TH Quarter 2003	3.5	3.3
1ST Quarter 2004	2.9	3.5
2ND Quarter 2004	1.2	2.4
3RD Quarter 2004	2.2	2.7
4TH Quarter 2004	3.2	3.4
1ST Quarter 2005	2.1	2.8
2ND Quarter 2005	1.8	3.2
3RD Quarter 2005	3.0	3.5
4TH Quarter 2005	3.2	3.5
1ST Quarter 2006	3.0	3.0
2ND Quarter 2006	2.0	2.7
3RD Quarter 2006	2.4	2.7
4TH Quarter 2006	3.5	3.7
1ST Quarter 2007	3.8	2.7
2ND Quarter 2007	2.1	1.2
3RD Quarter 2007	2.8	3.7
4TH Quarter 2007	2.6	3.1
1ST Quarter 2008	3.4	3.9
2ND Quarter 2008	2.2	2.9
3RD Quarter 2008	2.7	3.1
4TH Quarter 2008	3.4	3.4
1ST Quarter 2009	3.4	3.0
2ND Quarter 2009	2.3	2.8
3RD Quarter 2009	2.3	2.8
4TH Quarter 2009	3.0	3.0
1ST Quarter 2010	2.9	2.7
2ND Quarter 2010	1.5	2.1
3RD Quarter 2010	1.9	2.2
4TH Quarter 2010	1.8	2.3
1ST Quarter 2011	1.7	1.7
2ND Quarter 2011	1.3	1.6
3RD Quarter 2011	2.4	2.7
4TH Quarter 2011	2.6	2.8
Average	2.5	2.9
Standard Deviation:	0.7	0.8

3.7 Corrected value

Rio Tinto

Internal memo

POTABLE WATER QUALITY SUMMARY
2011

Coliform Count Summary

Date	**Drake #1** (well head)	**Administration Building Water Supply (PWW-1 or PWW-2)** (kitchen sink cold tap)
1/17/11	Good	Good
2/7/11	Good	Good
3/1/11	Good[1]	Good[1]
3/7/11	Good	Good
4/5/11	Good	Good
5/2/11	Good	Good
6/6/11	Good	Good
7/11/11	Good	Good
8/8/11	Good	Good
9/12/11	Good	Good
10/3/11	Good	Good
11/8/11	Good	Good
12/5/11	Good	Good

The Administration Building can be supplied by either PWW-1 or PWW-2. The water is tested monthly at the point of use and the results apply to whichever well is supplying the building at that time. The Senior Facility Technician and Security Guard Trailers are supplied by Drake #1 well.

[1] Exceeded hold time. Re-sampled on March 7, 2011.

KENNECOTT URANIUM COMPANY						
POTABLE WATER QUALITY SUMMARY						
2011						
DRAKE #1						
CHEMICAL ANALYSIS SUMMARY:						
Use Suitability	Domestic *	**DRAKE #1**	**DRAKE #1**	**DRAKE #1**	**DRAKE #1**	
Parameter	Concentration **	02/21/11	04/05/11	07/12/11	10/25/11	
Ammonia (NH3-N)	0.5	-	-	-	-	
Arsenic (As)	0.05	0.002	0.002	0.002	0.002	
Barium (Ba)	2	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Boron (B)	0.75	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Cadmium (Cd)	0.005	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	
Chloride (Cl)	250	3	2	3	3	
Chromium (Cr)	0.1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Copper (Cu)	1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Cyanide (CN)	0.2	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	
Fluoride (F)	4	0.2	0.2	0.2	0.2	
Hydrogen Sulfide (H2S)	0.05	-	-	-	-	
Iron (Fe)	0.3	ND (.05)	ND (.05)	ND (.05)	ND (.05)	
Lead (Pb)	0.015	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Manganese (Mn)	0.05	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Mercury (Hg)	0.002	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	
Nitrogen, Nitrate+Nitrite as N		ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Nitrite (NO2-N)	1	-	-	-	-	
Oil and Grease	Virtually Free	ND (5)	ND (5)	ND (5)	ND (5)	
Phenol	0.001	-	-	-	-	
Selenium (Se)	0.05	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	
Silver (Ag)	0.1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Sulfate (SO4)	250	49	48	58	52	
Total Dissolved Solids (TDS)	500	158	151	183	181	
Zinc (Zn)	5	0.09	0.01	0.03	0.02	
pH (Standard Units)	6.5 - 8.5	8.3	8.22	8.21	8.26	
Combined Ra226/Ra228 (pCi/L)	5.0 pCi/l	3.1	1.7	2.39	2.9	
Natural Uranium (pCi/L)	pCi/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	
Uranium - Suspended	mg/L	ND (0.0003)	ND (0.0003)	ND (0.0003)	ND (0.0003)	
Uranium - Total	mg/L	ND (0.0003)	0.0003	ND (0.0003)	0.0003	
Lead 210 (pCi/L)	pCi/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	
Total Strontium 90 (pCi/L)	8.0 pCi/l	-	-	-	-	
Gross Alpha Radioactivity *** (pCi/L)	15.0 pCi/l	1.1 ± 0.4	1.2 ± 0.4	1.9 ± 0.4	1.3 ± 0.4	
* This list does not include all constituents in the national drinking water standards.						
** mg/L, unless otherwise indicated						
*** Including Radium 226 but excluding Radon and Uranium						

KENNECOTT URANIUM COMPANY						
POTABLE WATER QUALITY SUMMARY						
2011						
PWW-1						
CHEMICAL ANALYSIS SUMMARY:						
Use Suitability	Domestic *	**PWW-1**	**PWW-1**	**PWW-1**	**PWW-1**	
Parameter	Concentration **	02/21/11	04/05/11	07/11/11	10/25/11	
Ammonia (NH3-N)	0.5	-	-	-	-	
Arsenic (As)	0.05	0.002	0.002	0.002	0.002	
Barium (Ba)	2	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Boron (B)	0.75	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Cadmium (Cd)	0.005	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	
Chloride (Cl)	250	3	2	2	3	
Chromium (Cr)	0.1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Copper (Cu)	1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Cyanide (CN)	0.2	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	
Fluoride (F)	4	0.2	0.2	0.2	0.2	
Hydrogen Sulfide (H2S)	0.05	-	-	-	-	
Iron (Fe)	0.3	ND (0.05)	0.07	0.07	0.08	
Lead (Pb)	0.015	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Manganese (Mn)	0.05	0.01	0.01	0.01	0.01	
Mercury (Hg)	0.002	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	
Nitrogen, Nitrate+Nitrite as N		ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Nitrite (NO2-N)	1	-	-	-	-	
Oil and Grease	Virtually Free	ND (5)	ND (5)	ND (5)	ND (5)	
Phenol	0.001	-	-	-	-	
Selenium (Se)	0.05	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	
Silver (Ag)	0.1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Sulfate (SO4)	250	48	47	47	47	
Total Dissolved Solids (TDS)	500	161	156	171	188	
Zinc (Zn)	5	ND (0.01)	ND (0.01)	ND (0.01)	0.01	
pH (Standard Units)	6.5 - 8.5	8.38	8.35	8.35	8.24	
Combined Ra226/Ra228 (pCi/L)	5.0 pCi/l	1.39	1.98	0.35	1.72	
Natural Uranium (pCi/L)	pCi/L	2.5	1.1	1.5	1	
Uranium - Suspended	mg/L	ND (0.0003)	ND (0.0003)	ND (0.0003)	ND (0.0003)	
Uranium - Total	mg/L	0.0038	0.0018	0.0024	0.0015	
Lead 210 (pCi/L)	pCi/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	
Total Strontium 90 (pCi/L)	8.0 pCi/l	-	-	-	-	
Gross Alpha Radioactivity *** (pCi/L)	15.0 pCi/l	0.9 ± 0.4	0.6 ± 0.3	0.7 ± 0.3	1 ± 0.4	
* This list does not include all constituents in the national drinking water standards.						
** mg/L, unless otherwise indicated						
*** Including Radium 226 but excluding Radon and Uranium						

KENNECOTT URANIUM COMPANY						
POTABLE WATER QUALITY SUMMARY						
2011						
PWW-2						
CHEMICAL ANALYSIS SUMMARY:						
Use Suitability	Domestic *	**PWW-2**	**PWW-2**	**PWW-2**	**PWW-2**	
Parameter	Concentration **	02/21/11	04/05/11	07/12/11	10/25/11	
Ammonia (NH3-N)	0.5	-	-	-	-	
Arsenic (As)	0.05	0.002	0.002	0.002	0.002	
Barium (Ba)	2	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Boron (B)	0.75	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Cadmium (Cd)	0.005	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	
Chloride (Cl)	250	2	2	2	2	
Chromium (Cr)	0.1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Copper (Cu)	1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Cyanide (CN)	0.2	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	
Fluoride (F)	4	0.2	0.2	0.2	0.2	
Hydrogen Sulfide (H2S)	0.05	-	-	-	-	
Iron (Fe)	0.3	ND (0.05	ND (0.05	ND (0.05	0.13	
Lead (Pb)	0.015	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Manganese (Mn)	0.05	ND (0.01)	0.01	0.01	0.02	
Mercury (Hg)	0.002	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	
Nitrogen, Nitrate+Nitrite as N		ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	
Nitrite (NO2-N)	1	-	-	-	-	
Oil and Grease	Virtually Free	ND (5)	ND (5)	ND (5)	ND (5)	
Phenol	0.001	-	-	-	-	
Selenium (Se)	0.05	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	
Silver (Ag)	0.1	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
Sulfate (SO4)	250	42	42	43	42	
Total Dissolved Solids (TDS)	500	148	150	151	168	
Zinc (Zn)	5	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	
pH (Standard Units)	6.5 - 8.5	8.51	8.48	8.46	8.32	
Combined Ra226/Ra228 (pCi/L)	5.0 pCi/l	0.42	0.7	1.24	2.17	
Natural Uranium (pCi/L)	pCi/L	1.9	1.8	1.6	1.6	
Uranium - Suspended	mg/L	ND (0.0003)	ND (0.0003)	ND (0.0003)	0.0003	
Uranium - Total	mg/L	0.0028	0.0028	0.0026	0.0026	
Lead 210 (pCi/L)	pCi/L	1.3 ± 2.0	ND (1.0)	ND (1.0)	ND (1.0)	
Total Strontium 90 (pCi/L)	8.0 pCi/l	-	-	-	-	
Gross Alpha Radioactivity *** (pCi/L)	15.0 pCi/l	0.6 ± 0.3	0.6 ± 0.3	0.6 ± 0.3	0.8 ± 0.3	
* This list does not include all constituents in the national drinking water standards.						
** mg/L, unless otherwise indicated						
*** Including Radium 226 but excluding Radon and Uranium						

Rio Tinto

Internal memo

16 February 2012

To: SERP File

Subject: Safety and Environmental Review Panel (SERP) – 2011

During the calendar year 2011 the licensee has not:

- Made changes in the facility as described in the license application (as updated);
- Made changes in the procedures as described in the license application (as updated);
- Conducted tests or experiments not presented in the license application (as updated).

The Safety and Environmental Review Panel (SERP) issued a single Safety and Environmental Evaluation (SEE) in 2011. This document changed the composition of the Safety and Environmental Review Panel (SERP), removing the Mill Foreman who retired, and replacing him with the Senior Facility Technician in the position of the permanent member with expertise in operations and/or construction.

Oscar Paulson

Rio Tinto

Internal memo

16 February 2012

To: Respiratory Protection File

Subject: Respiratory Protection – 2011

The Mill Foreman, Senior Facility Technician, Facility Supervisor and contract Mill Laborer were the four (4) employees on site that were part of the facility's respirator program in 2011.

Their respiratory physicals and fit tests with respirator training were conducted on the following dates:

TITLE	RESPIRATOR PHYSICAL	FIT TEST/TRAINING
Senior Facility Technician	July 21, 2011	November 28, 2011
Facility Supervisor	October 29, 2011	November 28, 2011
Mill Laborer (contract)	July 24, 2011	August 25, 2011

All fit tests were conducted with stannic chloride irritant smoke. No employee used a respirator on site unless that individual had successfully completed a respirator physical and fit test within the last twelve (12) months. The Mill Foreman retired on July 13, 2011. He had a respirator physical on November 22, 2010 and a fit test and respirator training on November 23, 2010. At the time of his retirement he was still within twelve (12) months of his last respirator physical, fit test and respirator training, thus he did not require a respirator physical or fit test and training in 2011.

The Senior Facility Technician's respirator physical was slightly delayed in 2011 due to a respiratory tract infection.

Oscar A Paulson

Oscar Paulson

Rio Tinto

Internal memo

16 February 2012

To: File

Subject: Releases for Unrestricted Use – 2011

Releases for unrestricted use issued in 2011 were primarily related to the release of equipment, including:

- Toro Dingo (small walk-behind trencher)
- Two (2) pickup trucks

In the course of these releases, no item exceeded 5.4 dpm/100 cm^2 removable alpha or 304 dpm / 100 cm^2 total alpha.

Oscar Paulson

Rio Tinto

Internal memo

From	Oscar Paulson
To	Standard Operating Procedures File
Reference	**Annual Review of Standard Operating Procedures (SOPs)**
Date	29 December 2011
Number of pages	2

Requirement
License Condition 12.1 states: "An annual report of the review of all existing standard operating procedures, required to be performed by the RSO, shall be prepared and retained on site."

License Condition 9.6 states in part: "In addition, the RSO shall perform a documented review of all existing standard operating procedures at least annually."

Review of Standard Operating Procedures (SOPs) is ongoing throughout the year; with the majority of the review being performed in the spring of 2011; however, a final review was performed in December 2011. This review included all Standard Operating Procedures (SOPs) related to the Nuclear Regulatory Commission (NRC) license including Mill Operating Procedures (MOPs), Tailings Operating Procedures (TOPs), Health Physics Procedures (HPs), Environmental Procedures (EPs) and other Standard Operating Procedures (SOPs). Also, SOPs not related to the Nuclear Regulatory Commission (NRC) license were reviewed, revised and updated. The review was conducted over the course of the year and completed on December 29, 2011 with the preparation of this review document. The date of addition or revision for each procedure follows the name of the procedure.

A. Non-Radiologic SOPs

The following non-radiologic procedures were modified:

- The *Extreme Snowfall Plan* was revised on November 17, 2011 to reflect the availability of Archer Construction, Inc. during the winter of 2011-2012 for snow removal.
- SOP-1 *Four (4) Day Work Week* was revised on July 13 and December 29, 2011.
- SOP-2 *Delegation of Authority* was revised on July 13, 2011.

B. Radiological (NRC License) Related SOPs (HP, EP, TOP, SERP-OP and MOP)

The following procedures were modified:

- HP-3 – *Beta Survey* – September 8, 2011
- HP-4 – *Radon Daughter Survey* – August 23 and December 29, 2011
- HP-5 – *Internal and External Occupational Doses* – December 29, 2011
- HP-6 – *Total Alpha Surveys* – September 8, 2011
- HP-7 – *Personnel Alpha Monitoring and Decontamination* – December 20, 2011
- HP-9 – *Management Control, Bioassay Urine and In Vivo Programs* – June 7, 2011
- HP-11 – *Personnel Air Sampling* – June 9 and December 29, 2011
- HP-17 – *Yellowcake Pre Shipment Survey* – June 9, 2011
- HP-29 – *Training, Reporting and Qualifications of Facility Staff* – June 7, 2011
- HP-33 – *Shipment of Radioactive Samples* – June 7, 2011
- HP-35 – *Spill, Release, Excursion, Leak and Incident/Event Reporting* – August 30, 2011
- HP-37 – *Spills – Non-Operational Periods* – August 30, 2011
- EP-11 – *Thermoluminescent Dosimeter Area (TLD) Monitoring* – September 13, 2011
- EP-12b – *General Surface Water Sampling, Sample Preparation and Water Level Measurement Procedures* – September 13, 2011
- EP-13 – *General Ground Water Sampling and Sample Preparation Procedure* – September 12, 2011

- EP-13b – *General Ground Water Sampling, Sample Preparation and Water Level Measurement Procedures* – September 12, 2011
- EP-20 – *Photographic Monitoring* – December 29, 2011
- EP-24 – *Monthly Flow Verification Procedure for F&J Specialty Products, Inc. Digital Air Monitoring System – F&J Model DF-604* – September 8, 2011
- EP-26 – *Calculation Procedures for Dose to the Nearest Resident During Periods of Non Operation (Standby)* – March 29, 2011
- TOP-1 – *General Tailings and Evaporation Impoundment Procedures* – September 12, 2011
- TOP-4 – *Reduction of Voids in Material Placed in Tailings Cell for Disposal* – September 8, 2011

The following procedure was added:

- HP-42 – *General Fixed Gauge Procedures* – September 13, 2011

C. Other Procedures

The *Suspended Operations Procedure* was revised on December 29, 2011.

Oscar A Paulson

Oscar Paulson

Annual SOP Review-2011.doc

Rio Tinto

Internal memo

16 February 2012

To: Radiation Work Permit File

Subject Radiation Work Permits

No radiation work permits (RWPs) were issued in 2011.

Oscar Paulson

Rio Tinto

Internal memo

25 February 2012

Memo to File

SUBJECT: Dose Assessment / Determination of No Requirement for Individual Monitoring or Dose Calculation at the Sweetwater Uranium Project for 2011

This determination is being prepared to demonstrate that individual monitoring and dose calculation is not required at the Sweetwater Uranium Project due to the low levels of gamma radiation, airborne particulate radionuclides and radon present at the facility. The Sweetwater Uranium Project is a non-operating uranium mill, which suspended operations in the spring of 1983. This assessment is based on background data for the facility and data from radiation surveys and air sampling surveys taken at the facility during 2011.

Background

10 CFR 20 (in 20.1003) in the definition of occupational dose states, "Occupational dose does not include dose received from background radiation...." In order to assess the occupational dose received at the facility the background must be deducted from the total dose received. Background data for gamma radiation and airborne particulate radionuclides were collected in 1976 for the Environmental Report and in 1979 for the pre-operational monitoring program. The average upwind radon concentration for 2011 was used to represent the background radon concentration for the facility.

Item	Average Concentration	Dose
Background Gamma		200.7 mrem/yr (22.9uR/hr)
Airborne Particulates:		
U-nat	6.2E-16 uCi/ml	0.34 mrem/yr
Ra-226	3.9E-16 uCi/ml	0.22 mrem/yr
Th-230	3.9E-16 uCi/ml	0.65 mrem/yr
Pb-210	1.7E-14 uCi/ml	1.39 mrem/yr
Radon-222	2.26 pCi/l	160.10 mrem/yr

Note: Based on calculations prepared by Lyda Hersloff dated December 29, 1993.

Radon-222 concentration based on average of the first, second, third and fourth quarter upwind RadTrak Results. Averages of two (2) RadTrak units were used for each quarter.

The background dose for radon in working levels at the upwind monitoring site assuming daughters present is computed as follows:

(2.26 pCi/l) / (1E3 ml/l) / (1E6 pCi/uCi) = 2.26 E-09 uci/ml

0.33 WL = 3E-08 uCi/ml (with all daughters present)

[(2.26E-09 uCi/ml) / (3E-08 uCi/ml)] * (0.33 WL) = 0.025 WL for background (with daughters present)

The calculated equilibrium factor for the facility (1993 to 2011) average is 0.161. Given that all daughters are not present and the equilibrium factor is 0.161, the actual background radon daughter concentration is:

(0.161) * (0.025 WL) = 0.004 WL

Occupational Dose

1) Gamma Radiation

The average gamma dose at the facility is based on an average of survey results for twenty-eight (28) locations in the mill and twelve (12) locations in the ion exchange area and general surveys in the tailings impoundment and Catchment Basin excavation areas. The results are as follows:

Gamma Survey Results

Area	Total Dose	Background Dose	Occupational Dose
IX Area	190.0 uR/hr	22.9 uR/hr	167.1 uR/hr
Mill	76.0 uR/hr	22.9 uR/hr	53.1 uR/hr
Tailings	103.5 uR/hr	22.9 uR/hr	80.6 uR/hr

Approximately 306.2 hours are estimated to have been spent in the Mill and Solvent Extraction (SX) buildings by the Facility Supervisor and 340 hours are estimated to have been spent in the tailings impoundment by the Mill Foreman in 2011. These are the maximum times spent by any individuals in these areas. This estimate is based on the number of entries in the restricted area alpha survey record for January 1 to November 20, 2011, and assuming that each entry constitutes a full ten (10) hour day in either the mill or tailings impoundment, as indicated. From November 21 to December 31, 2011 actual logged hours were used. If both the mill and tailings impoundment were entered in a single day between January 1 and November 20, 2011, then it was assumed that five hours were spent in each area. From November 21 to December 31, 2011 actual logged hours were used. This assumption is very conservative since many entries in the alpha survey record are the result of a brief (1 - 2 hour) period in either the mill or tailings impoundment.

The table below estimates the gamma dose likely to be received by a maximally exposed individual:

Area	Time	Occupational Dose Rate	Total Dose
Mill & SX buildings	306.2 hours[a]	53.1 uR/hr	16.3 mrem
Tailings	340.0 hours[b]	80.6 uR/hr	27.4 mrem
Total			**43.7 mrem**

[a] Time spent by Facility Supervisor

[b] Time spent by Mill Foreman

Gamma survey results for the IX Area are not used in the dose assessment since little time is spent in that area since the unit is shut down.

Since the gamma levels are low in the mill and ion exchange area and only a limited amount of time is spent in these areas, it is unlikely that personnel would receive in one year from sources external to the body a dose in excess of 10% of any of the applicable limits in 20.1201(a); therefore, individual monitoring and dose calculation for external exposure is not required. Gamma doses measured in the Ion Exchange (IX) Area were not used in the estimate due to the very small amount of time spent in that area each year. This estimate assumes a one to one to one (1:1:1) equivalence of exposure (in Roentgens) to absorbed dose (in Rads) to equivalent dose (in REMs). For gamma radiation with a Quality Factor (QF) of one (1), this is acceptable.

Personnel (Luxel) dosimeters were used on site by all personnel during 2011 even though their use was not required, in part, to confirm these calculations. The highest external dose received for the calendar year was 4 millirems, confirming the low external exposure rates on site and the inherent conservative nature of these calculations.

2) Radon

The average radon dose at the facility is based on an average of survey results for three (3) locations in the ion exchange area, at least fourteen (14) locations in the mill and two (2) locations in the Solvent Extraction (SX) Building taken in June and December of 2011. The results are as follows:

Radon Sampling Results

Area	Concentration	Background	Occupational Dose
IX Area	0.002 WL	0.004 WL	0.000 WL
Mill Area	0.009 WL	0.004 WL	0.005 WL

The average occupational radon dose for facility personnel is:

{[(0.005 WL) / (0.33 WL/DAC)] * 306.2 hours} / (2000 DAC hours/ALI) = 0.002 ALI
(0.002 ALI) * (5000 millirems/ALI) = 11.6 millirems
Note: Intake in Allowable Limits of Intake (ALIs) rounded to 0.001 ALI

3) Airborne Particulate Radionuclides (Uranium/Radium-226/Thorium-230)

The average airborne particulate natural uranium dose at the facility is based on high volume air samples taken in the grinding and precipitation areas of the mill and the tailings impoundment in 2011 and seven (7) breathing zone samples taken of personnel working in the Mill and SX buildings.

The spreadsheet entitled Airborne Sampling Results (Using Maximum Values) attached to the Internal Occupational Exposure Assessment – Suspended Operations, details the maximum airborne particulate (natural uranium, Radium-226 and Thorium-230) concentrations. It yields a total dose from exposure to natural uranium, Radium-226 and Thorium-230 of 87.0 millirems to the maximally exposed individual (the Mill Foreman) from work in both the Mill and tailings impoundment. This is well below the 10% threshold that triggers monitoring and dose calculation. An absolute maximum dose estimate was also made by assigning the highest airborne natural uranium, Radium-226 and Thorium-230 concentrations measured in the Mill and Solvent Extraction buildings and the tailings impoundment to the maximum number of hours spent in each area by any individual during the year. This dose was 273 millirems. This is still less than 10% of the 5,000 millirem internal dose limit (one (1) Allowable Limit of Intake (ALI)) meaning that monitoring and reporting of internal dose is not required.

The maximum measured airborne natural uranium concentration was 4.81 E-12 µCi/ml which was from the questionable August 23, 2011 breathing zone sample. If this result were applied to the maximum possible number of hours that could be spent by any site worker (forty (40) hours) in the Mill and SX buildings in any given week and all of the uranium were soluble, it would result in the following exposure:

Calculation Basis:

Airborne activity:	4.81 E-12 µCi/ml
Maximum working hours in one (1) week:	40 hours
Minutes per hour:	60 minutes
Respiration rate:	2.00 E+04 ml/min
PicoCuries per microCurie:	1E+06 pCi/µCi
PicoCuries natural uranium per milligram:	677 picoCuries

Calculation:

[(4.81 E-12 µCi/ml)*(40 hours/week)*(60 minutes/hour)*(2.00 E+04 milliliters/minute)*(1E+06 picoCuries per microCurie)] / (677 picoCuries/milligram) = 0.341 milligrams

The maximum possible weekly exposure to natural uranium does not exceed 10 milligrams per week.

Based on the levels of airborne natural uranium, Radium-226 and Thorium-230 as demonstrated by the high volume air samples collected in the Mill Building, the level of natural uranium exhibited by the breathing zone samples collected in the Mill Building, and the levels of natural uranium, Radium-226 and Thorium-230 exhibited in the high volume air samples collected in the tailings impoundment and the limited time spent in the Mill and Solvent Extraction buildings (306.2) by the Facility Supervisor and 340 hours spent in the tailings impoundment by the Mill Foreman in 2011, it is unlikely that personnel would receive in one year an intake in excess of 10 percent of the applicable ALI for uranium (natural), Radium-226 and Thorium-230 in Table 1, Columns 1 and 2 of Appendix B therefore monitoring and dose calculation for uranium (natural) is not required. It is estimated that the total dose from natural uranium, Radium-226 and Thorium-230 does not exceed 87.0 millirems per year for 2011.

Conclusions:

1) Monitoring and calculation of external dose is not required at the Sweetwater Uranium Project since no personnel are likely to receive an external occupational dose in excess of 0.5 rem.

2) Monitoring and calculation of internal dose at the Sweetwater Uranium Project is not required because:
   a) Radon dose is calculated at 0.012 rem/year (0.002 ALI)
   b) The maximum calculated particulate dose based upon quarterly breathing zone samples is 0.087 rem/year

3) The maximum possible total occupational dose to the maximally exposed individual on site is as follows:

a)	Estimated external dose:	0.044 rem/yr.
b)	Estimated internal dose (particulates)	0.087 rem/yr.
c)	Estimated internal dose (Radon-222)	0.012 rem/yr.
	Total:	0.141 rem/yr.

These estimates are below 10% of the applicable limits that would trigger individual monitoring.

4) Tracking of external doses was done for all site personnel during 2011 using Luxel dosimeters. Due to the proven low dose rates at the facility, use of dosimeters is not required; however, it was done to confirm external exposure data from surveys. The highest annual dose received by any individual was four (4) millirems. This proves that the external dose estimate based upon surveys is conservative.

Oscar A Paulson

Oscar A. Paulson

Rio Tinto

Internal memo

16 February 2012

To: **NRC File**

Subject: Compliance with 10 Mrem Constraint Limit for 2011

The following pertains to the dose to a member of the general public from the Sweetwater Uranium Project:

- The mill is not operating so there are no emissions from any stacks.
- The only air emissions excluding radon and its progeny are particulate radionuclides from the tailings impoundment.

The following applies to these particulate emissions:

1. These emissions are monitored at Station 4A by a continuous low-volume system.

2. The radionuclide concentrations and doses encountered at this location are as follows:

U -nat:	1.24 E-16 uCi/L	0.069 mrem/yr
Ra-226:	1.43 E-17 uCi/L	0.001 mrem/yr
Th-230:	3.87 E-17 uCi/L	0.064 mrem/yr
Total:		**0.134 mrem/yr**

3. Background levels for the site are as follows:

U -nat:	6.2E-16 uCi/L	0.34 mrem/yr
Ra-226:	3.9E-16 uCi/L	0.22 mrem/yr
Th-230:	3.9E-16 uCi/L	0.65 mrem/yr
Total:		**1.21 mrem/yr**

Conclusions:

- The 2011 dose from airborne particulate radionuclides was at background levels. The 10 mrem per year constraint limit was not exceeded.

Oscar A Paulson

Oscar Paulson

Rio Tinto

Internal memo

20 February 2012

To: **NRC File**

Subject: Compliance with 40 CFR 190.10 for 2011

The following pertains to the dose to a member of the general public from the Sweetwater Uranium Project:

- The mill is not operating so there are no emissions from any stacks.
- The only air emissions excluding radon and its progeny are particulate radionuclides from the tailings impoundment.

40 CFR 190.10 states:

Subpart B—Environmental Standards for the Uranium Fuel Cycle

§ 190.10 Standards for normal operations.

Operations covered by this subpart shall be conducted in such a manner as to provide reasonable assurance that:

(a) The annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as the result of exposures to planned discharges of radioactive materials, radon and its daughters excepted, to the general environment from uranium fuel cycle operations and to radiation from these operations.

(b) The total quantity of radioactive materials entering the general environment from the entire uranium fuel cycle, per gigawatt-year of electrical energy produced by the fuel cycle, contains less than 50,000 curies of krypton-85, 5 millicuries of iodine-129, and 0.5 millicuries combined of plutonium-239 and other alpha-emitting transuranic radionuclides with half-lives greater than one year.

The following applies to exposures to planned discharges of radioactive materials, radon and its daughters excepted to the general environment from the Sweetwater Uranium Project.

1. These emissions are monitored at Station 4A by a continuous low-volume system.

2. The radionuclide concentrations and doses encountered at this location are as follows:

U -nat: 1.24 E-16 uCi/L	0.069 mrem/yr
Ra-226: 1.43 E-17 uCi/L	0.001 mrem/yr
Th-230: 3.87 E-17 uCi/L	0.064 mrem/yr
Total:	**0.134 mrem/yr**

3. Background levels for the site are as follows:

U -nat: 6.2 E-16 uCi/L	0.34 mrem/yr
Ra-226: 3.9 E-16 uCi/L	0.22 mrem/yr
Th-230: 3.9 E-16 uCi/L	0.65 mrem/yr
Total:	**1.21 mrem/yr**

4. The measured concentrations for 2011 are below background levels.

The following applies to radiation from the operation:

1. Background gamma radiation levels:

Gamma Exposure	**200.70 (approx. 22.9 uR/hr)**

Gamma background data is from the revised Environmental Report (August 1994).

2. Measured gamma radiation levels downwind of the tailings impoundment (downwind (Air 4A) air monitoring station):

	Annual Dose (Downwind (Air 4A) Air Monitoring Station)
Gamma Exposure	**172.7 mrem**

This measured exposure is slightly below site background.

Conclusions:

- The 2011 dose from airborne particulate radionuclides and radiation was at background levels. The 25 mrem per year limit in 40 CFR 190.10 was not exceeded.

Oscar A Paulson
Oscar Paulson
Facility Supervisor

Rio Tinto

Internal memo

26 February 2012

To: NRC File

SUBJECT: Other Items

The following other items are being evaluated.

Fire Protection:

Fire training was held on site for site employees on July 7 and December 20, 2011.

Emergency fire protection training involved:

- Training on fire water tanks
- Operation of the electric fire pump
- Operation of the diesel fire pump
- Tour of hose reel sheds

Annual fire extinguisher inspections were conducted on March 8, 2011. Annual fire hose testing was conducted on August 29 and 30, 2011.

Electrical ground integrity testing was performed on March 21 and 22, 2011.

Environmental Monitoring Data:

Environmental monitoring data for radon, airborne particulate radionuclides and ambient gamma radiation is addressed in the 40.65 Report.

Environmental monitoring data for groundwater including water quality and water level data is addressed in the Corrective Action Report (CAP) Review.

Other Training:

- MSHA Annual Refresher Training was held on Wednesday, January 5, 2011.
- Driver Training was held on Tuesday, January 4, 2011.
- Task Training was held on Tuesday, January 4, 2011.

Oscar A. Paulson

Oscar A. Paulson