



September 3, 2008

Peter Kusugak  
Manager of Field Operations  
Indian and Northern Affairs Canada  
P.O Box 2200  
Iqaluit, NU X0A 0H0  
[KusugakP@inac-ainc.gc.ca](mailto:KusugakP@inac-ainc.gc.ca)  
Fax 867-975-6445

Stephan Hartman  
Kivalliq Inuit Association  
P.O Box 340  
Rankin Inlet, NU S0C 0G0  
[shartman@kivalliqinuit.ca](mailto:shartman@kivalliqinuit.ca)  
Fax : 867-645-2448

Bernie MacIsaac  
INAC  
Manager of our Field Ops Section and the Inspectors  
[MacIsaacb@inac-ainc.gc.ca](mailto:MacIsaacb@inac-ainc.gc.ca)

Ms Phyllis Beaulieu  
Manager of Licensing  
PO Box 119  
Gjoa Haven NT X0E 1J0  
[licensing@nunavutwaterboard.org](mailto:licensing@nunavutwaterboard.org)

To All:

**Re: Kiggavik – Follow-up Report to August 04, 2008 spill of drill cuttings**

Please find the attached the 30-day follow-up report as required in accordance with Nunavut Water Board Licence No 2BE-KIG0812 and AREVA's Spill Contingency Plan Version 2, Revision 1. The report is submitted to Indian & Northern Affairs Canada (INAC), the Nunavut Water Board (NWB), the Kivalliq Inuit Association (KIA) and Environment Canada (EC).

The 30-day follow-up report is intended to provide a summary of the incident, a review of the impact assessment. This incident has been reported and handled as a spill and the impact was primarily confined.

Yours truly,

A handwritten signature in blue ink, appearing to read 'Mark Warbanski'.

Mark Warbanski, B.Sc.  
Environmental Health and Safety Coordinator



**AREVA Resources Canada Inc.  
Kiggavik Project, Nunavut**

**Final Incident Report for August 4, 2008 Spill**

## **INTRODUCTION**

On August 4, 2008 a spill of radioactive drill cuttings occurred at AREVA Resources Canada Inc (AREVA) Kiggavik Project Exploration site, located 80 kilometers west of Baker Lake. The spill occurred at rig #2, hole AND-08-04 located 14 km Southwest of the Kiggavik camp site at the UTM location 14W 553326 7134893. The spill occurred while the helicopter was lifting a bag of radioactive cuttings to transport it to the radioactive storage area. As the lift began, a failure in the bag resulted in approximately 0.25 m<sup>3</sup> of cuttings spilled onto the tundra, covering an approximately 2 m<sup>2</sup> area. The spill was cleaned in accordance with AREVA's Spill Contingency Plan and Uranium Exploration Plan.

The spill was discovered on August 4 and reported within 24 hours of the occurrence. This 30-day report is being submitted as a follow-up to the initial spill report, as required by the Nunavut Water Board License No 2BE-KIG0812 and AREVA's Spill Contingency Plan Version 2, Revision 1. This report is being submitted to Indian and Northern Affairs Canada (INAC), the Nunavut Water Board (NWB), Kivalliq Inuit Association (KIA) and Environment Canada (EC). It is intended to provide a summary of the incident, a review of the impact assessment and the status of corrective and preventative measures.

## **INCIDENT SUMMARY**

### **July 7, 2008**

- HQ drilling begins at AND-08-04.

### **July 7 – August 4, 2008**

- Drilling continues without incident

## **August 4, 2008**

### **18:20**

- The helicopter was lifting a bag of cuttings to transport it to the radioactive storage area.
- Upon lifting the cutting bag, the bag tore on the Cuttings separator harness.
- The side of the bag failed and approximately 0.25 m<sup>3</sup> of cuttings spilled onto the tundra, covering an approximately 2 m<sup>2</sup> area.
- The drillers immediately surrounded the spill with sand bags and started shoveling the mineralized cuttings into a cuttings tub (pictures 1 and 2).

### **19:12**

- EHS arrived at the site to do a gamma survey of the area and document the incident.
- Initial measures after the incident indicated, maximum readings of 0.44 µSv/h. Measurements taken after cleaning indicated a measurement of 0.30 µSv/h. Upon completion of the exploration, drill sites must be cleaned to the extent that gamma dose at a height of 1m is less than 1 µSv/h.
- The incident was reported to the Government of Nunavut spill line. The Spill hotline then reported the spill to Environment Canada and Indian and Northern Affairs Canada.

## **August 5, 2008**

- The Kivalliq Inuit Association and the Nunavut Water Board was contacted by phone of the incident.

## **INCIDENT CAUSE**

The cutting bags that were used for the 2008 drill program were left over bags from 2007 drill program. The drilling contractors properly packaged and filled the cutting bags, the lift conducted by the helicopter was found to have been conducted according to transport procedures, by connecting all four bag straps to the long line bell and lifting the helicopter off at a slow ascent. However upon ascent, Boart Longyear contractors did not guide the cuttings bag appropriately and the bag caught an edge on the separator. Upon lifting the bag, the bag tore on the cuttings separator harness. The bag was cut open and the drill cuttings were deposited on the ground.

## **IMPACT ASSESSMENT**

The spill of cuttings at AND-08-04 impacted approximately 2 m<sup>2</sup> of tundra. Upon EH&S initial arrival at the spill site, the initial gamma survey indicated readings of 0.44 µSv/h. Additional cleaning of the spill site was conducted, the second gamma survey indicated measurements of 0.30 µSv/h.

The spill was confined to a relatively small area of land, did not reach water and was cleaned up immediately following the incident, with gamma surveys indicating that the cleaned site meets the criterion established by permit issued to the Kiggavik Project.

## **CORRECTIVE AND PREVENTATIVE MEASURES**

Corrective measures were taken as follows:

- The torn bag was a result of proper long line procedures that were not followed. The drilling contractors were to guide the cuttings bag out of the separator harness. Work procedures for cuttings and cutting bags were reviewed.
- Drill bags were replaced with new stronger and more durable bags
- Environmental Management was added to the site orientation checklist to ensure that all drilling staff are aware of the proper procedures for cuttings and cutting bag management. All staff orientation records are kept to ensure that compliance of these new preventative measures are understood by all.
- Drill Cutting collected in the bags will be placed inside of a secondary containment such as a tub. The tub will act as the secondary containment to ensure that any incident with the removal of the cutting bag from the separator will be contained.

## CONCLUSIONS

On August 4, 2008 a spill of radioactive cuttings occurred at the Kiggavik Project. The follow-up investigation concluded that:

- The spill was caused by a combination of events
  - Failure to adequately follow procedures for the transport of cuttings properly
  - Secondary containment should be used under the bag and separator. Collecting tubs will be used under the bags to ensure any possible spill will be contained.

## APPENDICIES





# NUNAVUT SPILL REPORT (Oil, Gas, Hazardous Chemicals or other Materials)

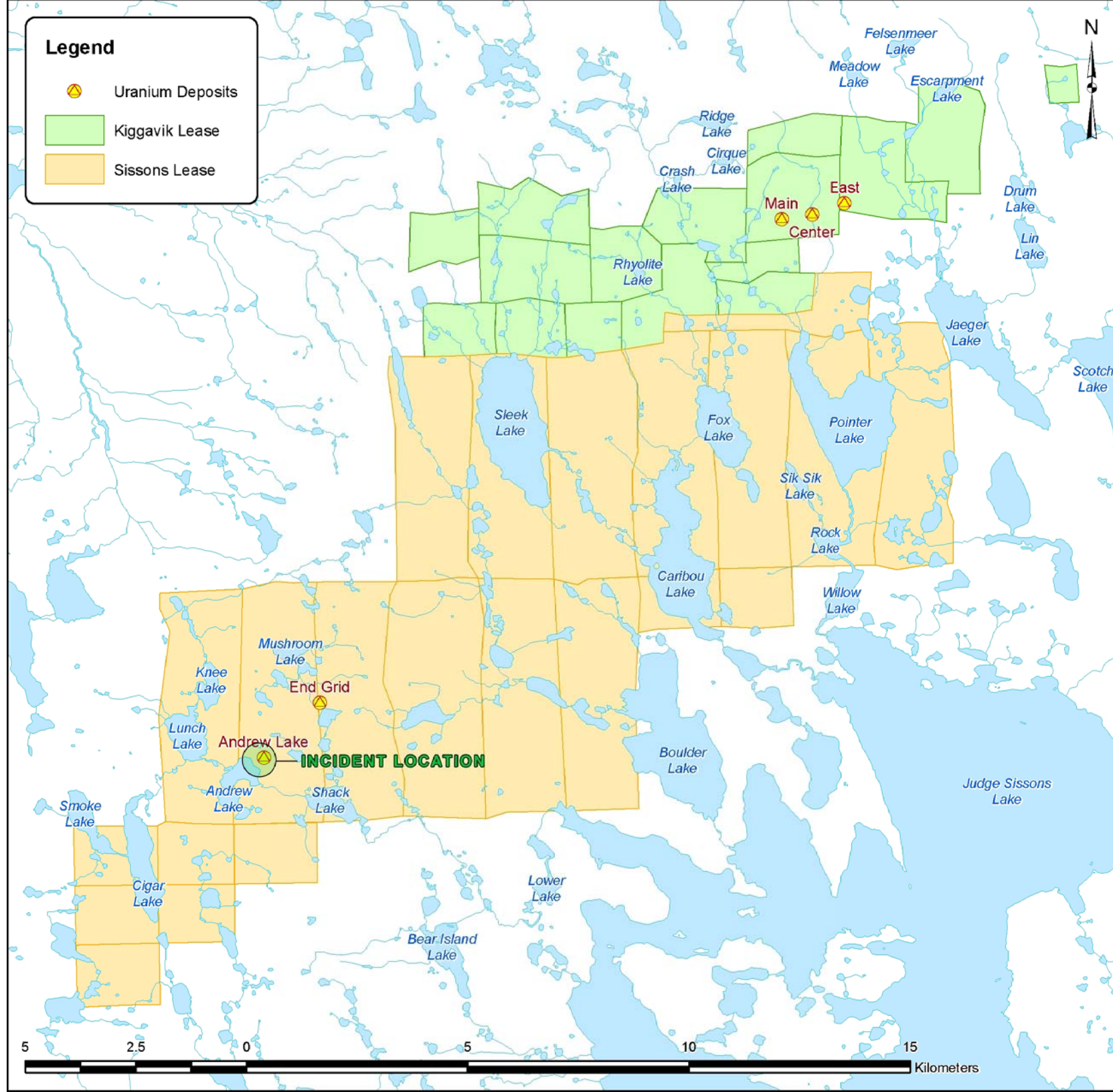
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24-Hour Report Line 24-ᓄᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ

Phone/ᓄᓇᓂᓐᓂᓐ (867) 920-8130

Fax/ᓄᓇᓂᓐᓂᓐ (867) 873-6924

<b>A</b> Report Date and Time ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ		<b>B</b> Date and Time of Spill (if known) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ		<b>C</b> <input checked="" type="checkbox"/> Original Report ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ		Spill Number ᓄᓇᓂᓐᓂᓐ	
Aug. 4, 2008 7:35 pm		Aug. 4, 2008 6:35 pm		<input type="checkbox"/> Update No. _____ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ		08-375	
<b>D</b> Location and Map Coordinates (if known) and Direction (if moving) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ (ᓄᓇᓂᓐᓂᓐ) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ (ᓄᓇᓂᓐᓂᓐ)							
Sissons Lease 14W553326 7134893							
<b>E</b> Party Responsible for Spill ( Full Name and Address) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ (ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ)							
Areva Resources PO Box 9204 1-2345, Ave C North, Saskatoon SK, S7K 3X5							
<b>F</b> Product(s) Spilled and Estimated Quantities (provide metric volumes/weights if possible) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ (ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ)							
Mineralized drill cuttings 0.25 m <sup>3</sup>							
<b>G</b> Cause of Spill ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ							
Tote bag in which drill cuttings were being collected broke							
<b>H</b> Is Spill Terminated? ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ?		<b>I</b> If Spill is Continuing, Give Estimated Rate ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ		<b>J</b> Is Further Spillage Possible? ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ?		<b>K</b> Extent of Contaminated Area (in square metres if possible) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ (ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ)	
<input checked="" type="checkbox"/> Yes/ᓄᓐ <input type="checkbox"/> No/ᓄᓐ		N/A		<input type="checkbox"/> Yes/ᓄᓐ <input checked="" type="checkbox"/> No/ᓄᓐ		2m <sup>2</sup>	
<b>L</b> Factors Affecting Spill or Recovery (weather conditions, terrain, snow cover, etc.) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ				<b>M</b> Containment (natural depression, dykes, etc.) ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ			
none				Sandbags surrounding Area			
<b>N</b> Action, if any, taken or Proposed to Contain, Recover, Clean Up or Dispose of Product(s) and Contaminated Materials ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ							
Sandbags were placed around area, cuttings were shoveled and put into new container							
<b>O</b> Do You Require Assistance? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, describe: ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ				<b>P</b> Possible Hazards to Persons, Property or Environment e.g. fire, drinking water, fish or wildlife ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ			
None							
<b>Q</b> Comments and/or Recommendations ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ						<b>FOR SPILL LINE USE ONLY</b> ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ	
Method of Containment for mineralized cuttings to be reviewed for prevention of future recurrence.						Lead Agency ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ	
						Spill Significance ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ	
						Lead Agency Contact and Time ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ	
						Is this file now closed? ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ	
Reported By ᓄᓇᓂᓐᓂᓐ		Position, Employer, Location ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ				Telephone ᓄᓇᓂᓐᓂᓐ	
Nicola Banton		Project Engineer, Areva Resources, Kiggavik				1-306-683-9843	
Reported To ᓄᓇᓂᓐᓂᓐ		Position, Employer, Location ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ ᓄᓇᓂᓐᓂᓐ				Telephone ᓄᓇᓂᓐᓂᓐ	







**Photo #1: Spill of drill cuttings**



**Photo #2: Containment of spill with sand bags**



**Photo #3: Separator Set-up**



Pre-gamma

## Kiggavik Project - Gamma Survey

Date: July 9/08 (mark drill hole as ⊗)

GPS Drill Hole Location: N 7134893.0 E 553326.0

Grid spacing: 5 m X 5 m

Drill Hole #: AND-08-04

All gamma readings will be written as  $\mu\text{Sv}$

			0.142	0.043	0.051	0.119		
			0.130	0.075	0.142	0.131		
			0.155	0.081	0.051	0.148		
			0.092	0.027	0.042	0.077		
			0.066	0.126	0.043	0.081		
			0.034	0.025	0.316	0.033		
			0.026	0.075	0.189	0.017	0.013	
		0.051	0.054	0.216	0.087	0.113	0.087	
		0.081	0.158	0.043	0.049	0.054	0.022	
		0.071	0.081	0.045	0.031	0.043	0.078	
		0.162	0.170	0.033	0.075	0.047	0.009	
		0.110	0.042	0.081	0.063	0.252	0.054	