



Aboriginal Affairs and
Northern Development Canada

Affaires autochtones et
Développement du Nord Canada

WHAT'S HAPPENING in the in the Wek'èezhìi area?

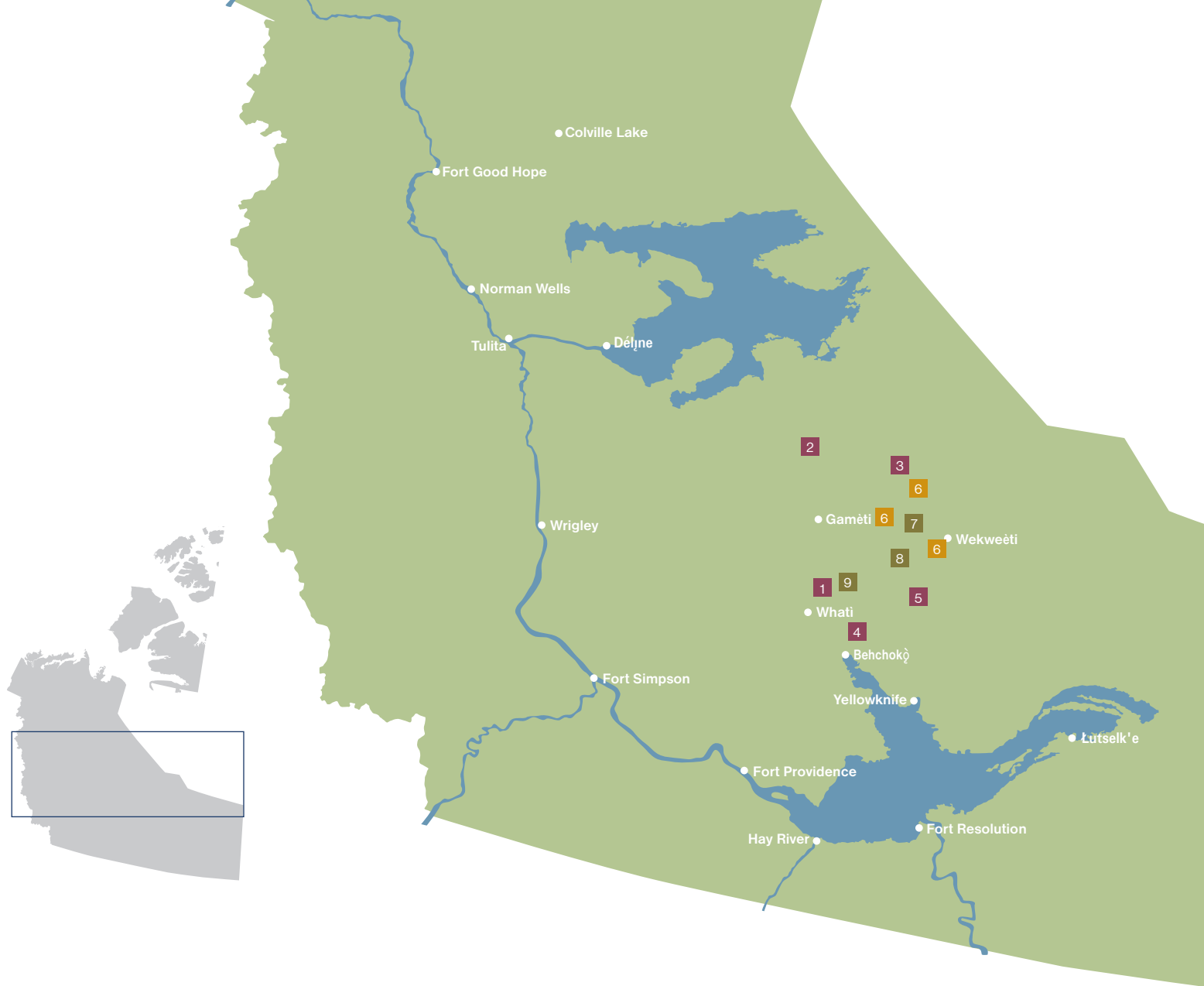
Contaminated Site Remediation

2012 in Review

About The Contaminants And Remediation Directorate

Aboriginal Affairs and Northern Development Canada (AANDC) recognizes the importance of cleaning up contaminated sites and preventing future contamination. The Contaminants and Remediation Directorate (CARD) in the NWT currently manages over 30 contaminated sites at various stages of remediation. Many of these sites became the Government of Canada's responsibility after private owners relinquished their properties according to the legislation of the day, or when companies went bankrupt. The properties then reverted to the Crown, and as representative of the Crown, AANDC became custodian of these properties and related remediation activities.

Canada



10-Step Process

In 1999, the Contaminated Sites Management Working Group released the document *A Federal Approach to Contaminated Sites* outlining a 10-step process for addressing a federal contaminated site. These guidelines were developed to ensure that there would be a common approach to the management of contaminated sites.

For more information on the 10-step process, please visit <http://www.federalcontaminatedsites.gc.ca/managing-gestion/index-eng.aspx>

1	Horn Plateau/Marian Lake area	6	Nighthawk Gold Corporation sites ¹
2	Indore/Hottah (Beaverlodge) Mines	7	Colomac Mine
3	Norris Lake	8	North Inca Mine
4	Sun-Rose Claim Group	9	Rayrock Mine
5	Wijinnedi Lake		

¹ Chalco Lake Exploration Site, Diversified/Indigo Mine, Spider Lake Exploration Site

LEGEND:

 Assessment Sites Steps 1-7	 Sites In Remediation Steps 8-9	 Completed/Monitoring Step 10
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Assessment Sites

A number of contaminated sites have been identified and prioritized for assessment in the Wek'èezhii Area.



The Rex property from above in 2009.

1 Horn Plateau/Marian Lake Area: Rex Property

The Rex property is a former uranium exploration site, located on the north side of Sheldon Lake, 156 kilometers northwest of Yellowknife, and 66 kilometers northwest of Behchokǫ̀. Although it is identified as “Horn Plateau” in maps, the site is not geographically related to the actual Horn Plateau, an area located further south. Mineral exploration at the site was conducted by different groups between the 1950s and mid-1970s with the primary focus being on uranium.

CONCERNS AT THE SITE INCLUDE:

- Potential radioactive waste rock and sediment
- Remains of camp site and dumpsites
- Remaining workings from exploration activity

WORK COMPLETED:

2012-13 – Combined Phase I and Phase II Environmental Site Assessment.

WHAT'S NEXT?

The results of the Environmental Site Assessment will be reviewed to determine what future work is required. ■

2 Indore / Hottah (Beaverlodge) Mines

The Indore and Hottah (Beaverlodge) Mines are located 12 km apart on Hottah Lake and Beaverlodge Lake respectively, approximately 100 km north of Gamètì in the Northwest Territories. Indore Mine was originally staked for uranium exploration in 1950, and operated off and on until it was closed in 1956. Hottah (Beaverlodge) Mine is a former uranium mine which had various owners between 1943 and 1977, after which, responsibility for the site reverted to the Crown.

CONCERNS AT INDORE MINE INCLUDE:

- A small quantity of tailings remaining on land
- Slightly elevated radioactive waste rock and sediment
- Unsecured mine openings, including a mine shaft and adit
- Remains of former buildings and dumpsites
- Miscellaneous debris and materials which contain asbestos
- Elevated uranium levels in the waste rock

CONCERNS AT HOTTAH (BEAVERLODGE) MINE INCLUDE:

- Unsecured mine openings, including mine shaft, and trenches

- Radiation levels and uranium levels in waste rock near the pits
- Burned remains of former buildings
- Miscellaneous debris and scrap

WORK COMPLETED:

2008-09 - Phase III Environmental Site Assessment.

2008-09 - Human Health Risk Assessment.

2009-10 - Elders site tour.

2010-11 - Remedial options were selected through input from the Tłıchǫ Elders and Executive.

2011-12 - Poor weather did not permit site access for this year's field season.

2012-13 - Archaeological Assessment and a Site Investigation to resolve data gaps complete.

WHAT'S NEXT?

A meeting with Tłıchǫ Elders is planned for early 2013 to discuss the Remedial Action Plan. Initial remediation work is expected to begin following winter road construction and mobilization to site in March of 2015. Remediation is expected to take approximately one year and will include closure of mine openings, addressing waste rock dumps, demolition of buildings and tanks and off-site removal of wastes. ■



The Wijnnedi Lake site from above in 2010.



An old building stands at Indore/Hottah site in 2009.

3 Norris Lake

The Norris Lake property is a former gold and base metal exploration site, located on the Emile River, approximately 235 kilometers northwest of Yellowknife and 32 kilometers west of the Colomac Mine site. Mineral exploration activities first began in 1938 and continued through different periods until 1982.

CONCERNS AT THE SITE INCLUDE:

- Remains of the former camp site and dumpsites
- Waste oil storage barrels
- Metal and waste rock debris
- Hydrocarbon and metals-contaminated soil

WORK COMPLETED:

2012-13 – Combined Phase I and Phase II Environmental Site Assessment.

WHAT'S NEXT?

The results of the Environmental Site Assessment will be reviewed to determine what future work is required. ■

4 Sun-Rose Claim Group

The Sun Rose property is a former uranium exploration site, located on the north side of Chico Lake, 123 kilometers northwest of Yellowknife and 35 kilometers north of Behchokò. The site is located adjacent to the winter road route between Marian Lake and Snare Lake Hydro junction. This route was also used for a brief time as an all weather road route to the former Rayrock Mine.

CONCERNS AT THE SITE INCLUDE:

- Potential radioactive waste rock and sediment
- Remains of buildings, roadways and dumpsites
- Remaining workings from exploration activity

WORK COMPLETED:

2012-13 - Phase II Environmental Site Assessment.

WHAT'S NEXT?

The results of the Environmental Site Assessment will be reviewed to determine what future work is required. ■

5 Wijnnedi Lake

The Wijnnedi Lake property is a former gold exploration site, located on the east side of Wijnnedi Lake, 172 kilometers north-northwest of Yellowknife, and 133 kilometers northeast of Behchokò. Mineral exploration activities took place in the 1940s by both Vive Yellowknife Gold Mines, and Yellowknife Volcanic Gold Mines Limited. Exploration ceased in the late 1940s but a prospector camped in the only remaining log cabin on and off between the mid 1970s and 2001.

CONCERNS AT THE SITE INCLUDE:

- Remains of former buildings and dumpsites
- Fuel drums
- Hydrocarbon-contaminated soil

WORK COMPLETED:

2012-13 – Combined Phase I and Phase II Environmental Site Assessment.

WHAT'S NEXT?

The results of the Environmental Site Assessment will be reviewed to determine what future work is required. ■



Sites in Remediation

The Diversified Mine site as seen from the air in the fall of 2012.

6 Nighthawk Gold Corporation Sites

(Chalco Lake Exploration Site, Diversified/Indigo Mine, Spider Lake Exploration Site)

In December 2011, Aboriginal Affairs and Northern Development Canada negotiated an agreement with Nighthawk Gold Corporation (formerly known as Merc International) to exchange a number of mineral claims and leases at the Colomac site in return for Nighthawk remediating three other contaminated sites in the Wek'èezhii Area.

Nighthawk has agreed to protect the existing remediation efforts at the Colomac site and will work with both the Wek'èezhii Land and Water Board and the Tłıchǫ Government when carrying out site remediation in accordance with the Closure and Reclamation Plans submitted for the Diversified/Indigo, Spider Lake, and Chalco Lake sites under the Land Use Permit.

WORK COMPLETED:

Chalco Lake Exploration Site

In August 2012, site remediation contractors removed more petroleum-impacted soil and debris and collected confirmatory samples. In September 2012, a Hercules aircraft was mobilized to the Colomac site to remove stockpiled contaminated soil that had been staged at Colomac.

Diversified/Indigo Mine

In March and April 2012, the head frame was brought down along with many of the buildings and structures.

Spider Lake Exploration Site

There has been limited activity at Spider Lake to date. ■

Remediation Completed/Monitoring

Rambo Mackenzie, Tłıchǫ Environmental Monitor, stands next to non-hazardous land fill cap in Zone 2.5 Pit during the summer of 2012.

7 Colomac Mine

The Colomac Mine was a gold mine in operation from 1989 to 1997 and is located 222 km northwest of Yellowknife. Mining production lasted from 1990-97 and the following year, Royal Oak Mines Inc. placed the mine in care and maintenance. It reverted to the Crown in 1999 when Royal Oak Mines Inc., went into receivership.

CONCERNS INCLUDED:

- Contaminated water management and treatment
- Exposed tailings and potential wildlife impacts
- Hydrocarbon-contamination at former tank farm area, mill and shop
- Hydrocarbon-impacted bedrock, groundwater, soil and sediment along Steeves Lake shoreline
- Waste oil and chemical inventories at mine closure
- Abandoned mine complex buildings
- Open pits and abandoned quarries

WORK COMPLETED:

1999-00 – Emergency care and maintenance and site clean-up.

2001-03 – Water treatment to reduce cyanide and cyanide-related compounds, ammonia, and heavy metals in Tailings Lake and Zone 2.0 Pit.



After: The Colomac Mine site in 2012.

2004-05 – Demolition and excavation of the tank farm and construction of the barrier wall and land treatment unit.

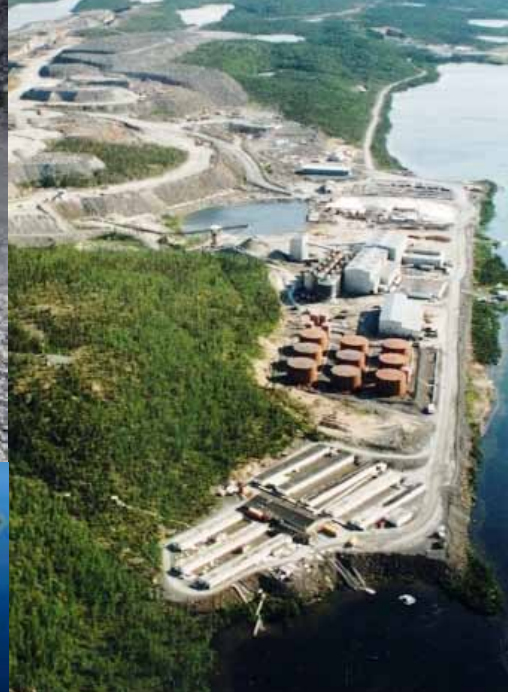
2006-07 – Tailings Lake and Zone 2.0 Pit water treated to discharge levels and construction of major civil works (Dam 1B, tailings cap, discharge channel)

2008-09 – Construction of caribou berm, decommissioning of caribou fence, waste consolidation, waste oil inventory.

2010-11 – Final site remediation, including demolition of buildings, remediation of the Steeves Lake shoreline, treatment of hydrocarbon-impacted soil and water, collection of free product, routine water quality monitoring.

2011-12 – Treatment of remaining hydrocarbon-impacted soils, final site clean-up and demobilization from site.

2012-13 – Long-Term Monitoring Phase began. Monitoring is community-based and includes the continuation



Before: The Colomac Mine site in 1999.

of the Adaptive Hydrocarbon Management Program to address residual hydrocarbons in the bedrock. Environmental monitoring includes water quality, water levels in lakes and pits, geotechnical stability of Dam 1B, tailings cap, spillway and discharge channel, non-hazardous landfill. Restoration monitoring includes stream flow and habitat restoration, erosion, and aquatic/terrestrial health.

The large steel warehouse known as “Big Blue” has remained on site at the request of the Tłıchǫ and was officially handed over to the Tłıchǫ Government in June 2012.

WHAT'S NEXT?

Monitoring will continue at the site by the Colomac Project Management Team until it can be determined that remediation has been effective and that site conditions have reached a steady state. In the meantime, Nighthawk Gold Corporation has a land use permit in the area to explore for minerals and regulatory inspections under that permit will be conducted by AANDC Inspectors. Nighthawk's activities are exploratory in nature and will not affect what has been done to remediate the site. ■



In June 2012, AANDC held a formal site blessing ceremony at the former mine site with Tłıchǫ leadership and Tłıchǫ Elders which included the unveiling of a commemorative monument that has been permanently installed at the former camp site to tell future visitors about the three phases of the site: traditional use of the area by the Tłıchǫ People in the past, mine production and socio-economic benefits and the remediation and closure of the site. The monument is written in English, French and Tłıchǫ.

Celebrating the Completion of Colomac

To celebrate the completion of the final remediation of Colomac and to acknowledge the efforts of many people over the years, AANDC held an event in Behchokǝ in December 2011. Elders from the surrounding three Tłıchǫ communities were flown into Behchokǝ to join in the festivities. The Tłıchǫ Grand Chief and Community Chiefs were also in attendance as well as representatives from the Tłıchǫ Government, Tłıchǫ Investment Corporation and Wek'èezhii Land and Water Board.

The evening included a feast and the presentation of recognition plaques to over 60 individuals, companies and organizations, all of whom made significant contributions to the project. Another highlight of the event was a video compiled by the Colomac Project Team which included footage filmed at the site over the years; particularly, staff who worked on the remediation and Elders who contributed to the remediation planning.

Also on display was a miniature replica of the site before remediation began, photos of the site before and after remediation, and a life-sized photo of a slab of rock at Colomac where site visitors have etched their names over the years. Attendees were not only invited to peruse the names on the rock; pens were provided so that everyone at the celebration could sign their names on the photo. ■

The Colomac Remediation Project: Award of Excellence

The success of the clean up at Colomac was recognized by the Consulting Engineers of Alberta at their annual Showcase Awards on January 26 of this year. The purpose of the award ceremony is to recognize projects and companies who have found exceptional solutions to engineering challenges.

Awarded to the Remediation Team (the Government of Canada and AECOM Ltd), the Colomac Remediation Project was given the Award of Excellence in the Environmental category, which includes contaminated site clean-ups, solid-hazardous waste handling and treatment, and other special environmental projects.

The Colomac Project Team was recognized for the overall success of the remediation, including how the completion of the project contributes to a safer environment for the Tłıchǫ people and all northern residents. The award also credited the role that strong partnerships with the Tłıchǫ contributed to adopting environmental solutions which were based on traditional and local knowledge. The economic opportunities and training programs centered around the project were also noted as a reason for the overall success of the management and remediation of the site.

The Colomac Remediation Team is honoured to accept this award as another way to mark the successful completion of the project and the preservation of the ecological integrity of the former mine site. ■



The Project Team presented recognition plaques to those who have made significant contributions to the project over the years.

8 North Inca

The North Inca mine site is located approximately 190 kilometers north of Yellowknife. Gold exploration occurred at the site between 1945 and 1949, including surface and underground drilling. There has not been significant activity at the site since 1949.

CONCERNS INCLUDED:

- A partially open mine shaft
- Deteriorating buildings
- Two above-ground fuel storage tanks
- Asbestos-containing materials

WORK COMPLETED:

2009-10 - Remediation began and included the closure of mine openings, demolition of buildings and removal of fuel storage tanks.

2010-11 - Full remediation was completed with the removal of all materials from site and initial monitoring was conducted.

2011-12 - Further site inspections were carried out in 2012 to confirm the effectiveness of the remediation work. Also, a geotechnical study was carried out on the shaft cap and contoured waste rock.

WHAT'S NEXT?

An additional site inspection is scheduled for 2014 to ensure the remediation work continues to be successful. ■



The former Rayrock Mine site from above in 2009.

9 Rayrock Mine

The Rayrock Mine site is located 145 kilometers northwest of Yellowknife. Rayrock Mine was an underground uranium mine in operation from 1957 to 1959. During operations, approximately 70,000 tonnes of ore were processed, yielding 207 tonnes of uranium concentrate.

CONCERNS INCLUDED:

- Radioactive tailings which were deposited on land in two containment areas and a garbage dump
- The mine was also a potential source of radioactivity, through radon gas emissions from mine openings and ventilation shafts
- Miscellaneous debris and scrap that may contain asbestos

WORK COMPLETED:

1996-97 - Remediation complete - work included sealing all mine openings and ventilation shafts, relocating radioactive

material from the dump to the tailings piles and capping the tailings with a thick layer of silt-clay, followed by revegetation.

1998-99 - Completion of the short-term monitoring program, and the development of the long-term monitoring program.

1999-09 - Ten year annual monitoring as part of the long-term monitoring program (regulatory requirement of Canadian Nuclear Safety Commission Licence).

2009-10 - A performance assessment was initiated to review the current conditions of the site since reclamation activities in 1996 and compare it against the reclamation objectives and closure criteria

2010-11 - Additional monitoring completed and the Rayrock (K'wetiia'a) Elders Committee established to discuss community concerns about the site.

2011-12 - The Performance Assessment Report was completed and proposed a new monitoring frequency and scope for the site. A gap analysis of existing

Rayrock Transportation Route: Learning from Elders



Jonas Lafferty locates a point of interest on the historic map while others look on. AANDC documented all that the group had to say.

site data (wildlife, fish, vegetation, surface water, groundwater, soil, and sediment) was also conducted to identify what more information was required to complete a detailed Human Health and Ecological Risk Assessment.

WHAT'S NEXT?

Activities this year will include investigating an area of potentially unknown hydrocarbon contamination as well as an investigation of buried material to help close knowledge gaps. The Rayrock (K'wetii'a) Elders Committee will continue to meet to discuss findings from investigations and develop options for monitoring and maintenance. A mapping exercise with Tłıchǵ Elders in February 2012 also helped to better understand the historic transportation route. ■

In February 2012, nine Elders from the Tłıchǵ region came to Yellowknife to participate in a mapping exercise with AANDC staff. The purpose of the workshop was to discuss the historical transportation route that runs from the top of Marian Lake to Rayrock Mine. This all-weather road saw heavy traffic in the 1950s while Rayrock was in production and continues to be used today for recreation and traditional activities. Since the remediation of Rayrock, concerns have been heard about possible



Phillip Husky making notes to clarify historic map details.

contamination along that route and AANDC staff wanted to address those concerns.

Over the course of a day and a half, the Elders shared their memories of spills, accidents and other occurrences along the route while AANDC staff documented what they had to say. This information will help form future plans for addressing areas of concern along the route. This exercise is a great example of the importance of gathering Traditional Knowledge and has continued to build a strong relationship between the remediation team at AANDC and the Tłıchǵ. ■

Tłıchǵ Science Camp: Building on Success

For the past five years, AANDC has organized science camps for students from the Wek'èezhii Area. Students participate in a week-long introduction to the field of environmental science and learn about related federal government jobs. Holding science camps are a great opportunity for high school students to learn about environmental science, environmental concerns and remediation work going on in the Tłıchǵ region.

Next year, the science camp will transition to be organized through the Tłıchǵ Government instead of AANDC. As a community-based initiative, the Tłıchǵ Science Camp will continue to encourage Northern youth to turn their spark of interest in science into a flame! ■



Northern Contaminants Program

The Northern Contaminants Program (NCP) was established in 1991 in response to concerns about human exposure to elevated levels of contaminants in wildlife species that are important to the traditional diets of northern Aboriginal peoples. Early studies found a wide variety of substances, many of which had no arctic or Canadian sources, but which were, nevertheless, reaching unexpectedly high levels in the arctic ecosystem.

Each year, NCP researchers test various traditional foods in order to determine contaminant level trends. This research is a very important part of the Contaminants and Remediation Directorate Program as it is the primary research used to determine community diets and potential impacts caused by contaminants at a site.

The NCP is represented in the Northwest Territories by a regional committee called the Northwest Territories Regional Contaminants Committee. The committee develops and coordinates research priorities for the NWT and its membership includes Aboriginal organizations, government departments and health boards. It provides information to the public about

the presence and possible effects of contaminants and, in association with the Government of the NWT - Department of Health, information is also provided to the public on the risks and benefits of consuming traditional foods.

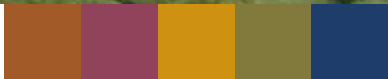
The NCP allocates funds for research and related activities in five main areas:

Human Health, Environmental Monitoring and Research, Community Based Monitoring and Research, Communications, Capacity, and Outreach, and National/Regional/International Coordination and Aboriginal Partnerships.

Research in the Wek'èezhii Area has included:

- Inda K'eu Aquatic Ecosystem Monitoring - fish sampling at Marian and Russell Lake

For results or additional information on these subjects, please contact the AANDC NT Region NCP representative at 867-669-2665. ■



If you see a Contaminated Site or have questions about sites in your area, contact us:

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This Publication is also available in French under the title: Que se passe-t-il dans la région du Wek'èezhii?