2021 Second Quarter Compliance Monitoring
&
Operational Performance Report

Reporting Period April 1 – June 30, 2021

Port Hope Conversion Facility
Operating Licence
FFOL-3631.00/2027

One Eldorado Place
Port Hope, Ontario
L1A 3A1

Submitted to:
The Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, Ontario
K1P 5S9

Submitted On: August 23, 2021

I Executive Summary

Cameco Corporation (Cameco) is committed to the safe, clean, and reliable operation of all its facilities and continually strives to improve its performance and processes to ensure the safety of both its employees and local residents. The Port Hope conversion facility (PHCF) maintains the required programs, plans and procedures in the areas of health and safety, radiation protection, environment, emergency response, fire protection, waste management, and training.

As a result of these programs, plans and procedures, PHCF's operations have maintained radiation exposures to workers and the public well below the regulatory dose limits. Environmental emissions are also being controlled to levels that are a fraction of the regulatory limits.

Cameco utilizes administrative levels and action levels to provide early detection of issues and ensure levels remain well below regulatory limits. A variety of control measures and practices are employed as part of site programs to ensure the protection of the public, the environment and site employees. A robust ALARA program is in place to ensure continual improvement and to ensure exposures and emissions remain well below action levels.

II Table of Contents

1.0 Second Quarter Overview

1.1 Facility Operation

Cameco continues to strive for operational excellence at all its facilities through consistent application of management systems to ensure that they operate in a safe, clean, and reliable manner. Corporate policies and programs, including that for Safety, Health, Environment and Quality (SHEQ) provide guidance and direction for all site-based programs and procedures that define the PHCF Quality Management System.

There were no significant changes to Structure, Systems and Components (SSC) or processes in the second quarter of 2021.

On April 17, 2021, a small release of Argon occurred from a valve on a tank used by the site laboratory services. The valve was isolated, and an investigation was completed.

On June 3, 2021, a small amount (< 1g) of uranium material was discharged from a vacuum exhaust system to the exterior of the UO_2 plant. ERT was activated to clean up the area. Results for environmental and radiation monitoring samples taken in the area indicated no impact to the environment as a result of this event.

The UO_2 plant ran continuously throughout Q2 2021 and safely shut down on June 23rd for annual maintenance. The UO_2 plant is scheduled to restart in late August.

The UF_6 plant ran continuously without issue throughout Q2 2021 with the exception of a two-day maintenance outage in April. The UF_6 plant will operate into July and then shut down for scheduled annual maintenance.

1.2 Physical Design / Facility Modification

There were no modifications affecting the safety analysis of the licensed facility made in the quarter that required written approval of the Commission or a person authorized by the Commission.

As part of the Vision in Motion (VIM) project, the site's Hydrogen tank is being relocated to the south end of the facility. Commissioning of the new tank is planned for later in 2021. A section of the PHCF Safety Report was updated to reflect this change and has been approved by CNSC staff.

2.0 Radiation Protection

This safety and control area covers the implementation of a radiation protection program, in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination and radiation doses are monitored and controlled.

There were no radiation dose exceedances in the second quarter of 2021.

Whole Body Dose

Table 1 shows the whole-body dose summary results from the second quarter of 2021 for six work groups: UF_6 Plant; UO_2 Plant, Maintenance; Technical Support (including Nuclear Energy Worker (NEW) contractors), Corporate Technical Services (formerly named Major Projects); and Administration.

There were no results above the monthly action level of 2 mSv during the quarter.

Table 1

Second Quarter 2021 Whole Body Dose Results				
Work Group	**Number of Individuals**	**Average Dose (mSv)**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**
UF_6 Plant	92	0.18	0.00	1.69
UO_2 Plant	23	0.11	0.00	0.26
Maintenance	69	0.10	0.00	0.60
Technical Support [1]	309	0.03	0.00	1.03
Corporate Technical Services	37	0.00	0.00	0.05
Administration	78	0.00	0.00	0.04
Total (Max)	**571**	**0.06**	**0.00**	**1.69**
[1]Includes contractors (NEWs) Quarterly Action Level 2.0 mSv (NEWs)				

Table 2 shows the employee average, minimum and maximum quarterly individual external whole-body exposures for the second quarter of 2020 through to the second quarter of 2021. The average whole-body dose is consistent with previous quarters when production was operational. The maximum whole-body dose received by a UF_6 Operator was related to work in the flame reactor area.

Table 2

Whole Body Dose Results by Quarter				
Monitoring Period	**Number of Individuals**	**Average Dose (mSv)**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**
Q2 2020	553	0.05	0.00	1.15
Q3 2020	642	0.04	0.00	0.87
Q4 2020	657	0.05	0.00	1.58
Q1 2021	533	0.12	0.00	2.34
Q2 2021	571	0.06	0.00	1.69
Quarterly Action Level 2.0 mSv (NEWs)				

Skin Dose

Table 3 shows the quarterly skin dose summary results for six work groups: UF_6 Plant; UO_2 Plant; Maintenance; Technical Support (including NEW contractors), Corporate Technical Services (formerly named Major Projects); and Administration. The highest exposures are from the UF_6 group related to work in the flame reactor area.

Table 3

Second Quarter 2021 Skin Dose Results				
Work Group	**Number of Individuals**	**Average Dose (mSv)**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**
UF_6 Plant	92	0.71	0.00	4.76
UO_2 Plant	23	0.39	0.00	1.37
Maintenance	69	0.52	0.00	2.73
Technical Support[1]	309	0.06	0.00	1.06
Corporate Technical Services	37	0.23	0.00	1.06
Administration	78	0.00	0.00	0.02
Total (Max)	**571**	**0.22**	**0.00**	**4.76**
[1]Includes contractors (NEWs) Quarterly Action Level 15.0 mSv (NEWs)				

Table 4 shows the employee average and maximum quarterly individual skin exposure for the second quarter of 2020 through to the second quarter of 2021. The average skin dose is consistent with previous quarters when production was operational. The

maximum skin dose received by a UF_6 operator was related to flame reactor area activities.

Table 4

Skin Dose Results by Quarter				
Monitoring Period	**Number of Individuals**	**Average Dose (mSv)**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**
Q2 2020	553	0.16	0.00	3.06
Q3 2020	642	0.14	0.00	2.53
Q4 2020	657	0.15	0.00	7.13
Q1 2021	533	0.28	0.00	5.70
Q2 2021	571	**0.22**	**0.00**	**4.76**
Quarterly Action Level 15.0 mSv (NEWs)				

Urine Analysis

The urine analysis action levels are presented in Table 5 below.

Table 5

Urine Analysis Action Levels		
Parameter		**Action Level**
Urinalysis (NEW)	Weekly - UO_2/UF_6 Operators, Maintenance, Technical Support	65 µg U/L
	Monthly - Administrative Support	25 µg U/L
	Long-term Contractors	65 µg U/L
	Short-term Contractors	80 µg U/L
	Chemical toxicity – post shift sample	500 µg U/L
	Fluoride toxicity – all samples	7 mg F/L
Urinalysis (Non-NEW)	Daily - Routine Sample	40 µg U/L
	Monthly - Routine Sample	25 µg U/L
	Chemical Toxicity - Post Shift Sample	500 µg U/L
	Fluoride Toxicity – All Samples	4 mg F/L

No urine analysis action levels were exceeded in the second quarter of 2021.

Table 6 shows the distribution of urine results for the second quarter of 2021. A total of 5,987 urine samples were collected and analyzed for uranium during the second quarter of 2021. The majority of routine urine analysis results (99.7%) were less than 5 µg U/L in the quarter.

All results above 13 µg U/L were screened by radiation protection staff. There were no official investigations for uranium in urine during the second quarter of 2021.

Table 6

Second Quarter 2021 Routine Urine Analysis Results	
Distribution of Results	**Q2 2021**
Number of Samples < 5 µg U/L	5,970
Number of Samples > 5 to < 25 µg U/L	16
Number of Samples > 25 to < 50 µg U/L	1
Number of Samples > 50 µg U/L	0
Number of Samples Analyzed (Uranium)	5,987

Table 7 presents the internal urine analysis doses for the last five quarters. The average and maximum internal urine analysis doses in the quarter were 0.01 mSv and 0.19 mSv, respectively, which was consistent with previous quarters.

Table 7

Internal Dose (Urine) by Quarter				
Quarter	**Number of Individuals**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**	**Average Dose (mSv)**
Q2 2020	410	0.00	0.22	0.02
Q3 2020	501	0.00	0.28	0.02
Q4 2020	532	0.00	0.13	0.01
Q1 2021	425	0.00	0.26	0.01
Q2 2021	453	0.00	0.19	0.01

Fluoride in Urine

A total of 2,128 urine samples were analyzed for fluoride during the second quarter, with summary results provided in Table 8.

There was one non-routine sample above the internal administrative investigation level of 4 mg F/L during the second quarter. The sample was investigated and determined to be non-occupational.

Table 8

Second Quarter 2021 Fluoride in Urine Analysis Results			
Type of Fluoride Samples	**Number of Samples**	**Minimum Concentration (mg F/L)**	**Maximum Concentration (mg F/L)**
All fluoride samples	2,128	0.1	4.1
Routine post-shift fluoride samples >= 7 mg F/L	0	-	-
Routine post-shift fluoride samples >= 4 mg F/L	0	-	-
Non-routine fluoride samples	357	0.1	4.1
Samples analyzed for U, insufficient volume (< 30mL) for F analysis	48	-	-

Lung Counting

The lung count trailer was at the Blind River Refinery until the end of April to complete the counting campaign there. In May, production employees from Cameco Fuel Manufacturing were lung counted and in June, PHCF technical support employees were lung counted.

Contamination Control

The PHCF is divided into three zones for contamination control purposes. Zone 1 areas (clean areas - no radioactive sources other than monitoring equipment) are clearly delineated. Whole body monitors are located at the Zone 1 boundary in the main lobby, men's, and women's change rooms. There is also a monitor located at the gate 12 vehicle port. In Zone 2 areas and the yard Zone 3 areas (transition areas – may contain limited amounts of uranium compounds), no visible contamination should exist and, when detected, loose contamination is promptly isolated, monitored, cleaned, and monitored again to ensure the contamination has been removed. Zone 3 production areas are production areas where uranium compounds are expected. Incidents of zone contamination are presented in Table 9.

Table 9

Second Quarter 2021 Alpha Contamination Monitoring Results			
Area	**Number of Samples Taken**	**Zone Contamination Criteria (Bq/cm²)**	**Number of Samples Above Criteria**
Zone 1	899	0.4	0
Zone 2	12,622	0.4	92
Zone 3 (Yard)*	0	0.4	0

*Note – Samples are not routinely required in the yard area. Samples are taken as required if contamination is suspected.

The contamination in Zone 2 areas was primarily detected in the office areas and lunchrooms of production buildings. Contamination measurements are taken upon request in Zone 3 areas when contamination is suspected and only documented when above the applicable levels.

Additional monitoring has been put in place due to Covid-19 protocols. Strategic conference and meeting rooms have been temporarily established as lunchrooms in response to the need of physical distancing during employee break times.

In-Plant Air

Routine air sampling is performed by collecting airborne particulate on air sampling filters and quantifying the airborne concentration of uranium. The second quarter results are presented in Table 10.

The site administrative level and derived air concentration (DAC), based on slow moving (low solubility) material, is 100 µg U/m^3 but protective measures, such as investigation and respiratory protection, are normally required as a precaution at lower DAC levels. Continuous air monitoring equipment (iCAMs) in the UF_6 and UO_2 plants are also used to provide early warning and to prompt response to elevated airborne uranium concentrations. Local alarms and direct communication with the control rooms provide early warning to plant personnel.

Table 10

Second Quarter 2021 In-Plant Air Uranium Concentration by Operations Group				
Operations Group	**Number of Samples Taken**	**Average (µg U/m^3)**	**Maximum (µg U/m^3)**	**Number of Samples Taken Above Administrative Level**
UF_6 Plant	4,935	9	573	68
UO_2 Plant	1,622	3	861	3
Waste Recovery	684	1	8	0
CUP	455	1	8	0

The maximum in-plant air sample of 861 µg U/m^3 was recorded on June 4, 2021 in the UO_2 plant. This result was from clean-up activities at the Hoffman vacuum. The area was posted as respirator required.

The average in-plant air concentrations were in line with the previous quarters in which production was operational.

3.0 Conventional Health and Safety

This safety and control area covers the implementation of a program to manage non-radiological workplace safety hazards and to protect personnel and equipment. Conventional safety statistics are presented in Table 11.

Table 11

2021 Safety Statistics					
Quarter / Parameter	**Q1 2021**	**Q2 2021**	**Q3 2021**	**Q4 2021**	**YTD**
First Aid Injuries	11	11	-	-	22
Medical Diagnostic Procedures	0	1	-	-	1
Medical Treatment Injuries	1	0	-	-	1
Other Recordable Injuries	0	0	-	-	0
Lost Time Injuries	0	0	-	-	0
Lost Time Injury Frequency	0	0	-	-	0
Lost Time Injury Severity	0	0	-	-	0

There were no lost time incidents that occurred in the second quarter.

Health and Safety Activities

- **Communications**: COVID teams (PPE, Protective Measures, HR & Medical and Logistics) continued to meet and disposition changes to existing site protocols as directed by the Ontario Government. In addition, site Management issues a weekly COVID update that communicates both municipality, provincial and federal data.
- **Education and Training**: Internal training ongoing within site COVID protocols and room occupancy levels remained lower in the quarter. External training was postponed in lieu of provincial lockdown requirements. Site room occupancy levels will be revisited in Q3.
- **Safety Awareness Activities**: The site safety recognition program rewarded employees for an improved safety performance and the CSSC conducted a glove give away and awarded all site employees for 2020 Safety Win performance
- **CSSC and Safety Subcommittees:** The CSSC committee continued completing regulatory meetings. Subcommittees were on hold until COVID interruption and

current lockdown protocols are amended. Where specific subcommittee initiatives are required, direct contact and disposition was made with each respective committee.

- **Safety & Industrial Hygiene**: Ongoing communication with manufacturers and suppliers continued. Cloud based monitoring software was acquired to aid in troubleshooting. Further, Fluorine rated PPE was being sought to increase and improve manual controls.
- **COVID Interruption**: Contractor work was kept to priority work with site management approval required for access. COVID screening for contractors remained in place.
- **Total Recordable Injury Rate (TRIR):** YTD TRIR = 0.54, 22 First Aids, 1 Medical Diagnostic & 1 Medical Treatment.

4.0 Environmental Protection

This safety and control area covers the programs that monitor and control all releases of nuclear and hazardous substances into the environment, as well as their effects on the environment, as the result of licensed activities.

Public Dose

ORL equations for Site 1 and Site 2 have been derived and are expressed in the form shown below.

Public Dose = Dose $_{Air}$ + Dose $_{Water}$ + Dose $_{Gamma}$ < 0.3 mSv/y

Note that as of July 1, 2019, TLD 13 has been replaced by TLD 10 in the gamma dose calculation for Site 1 due to the removal of the Centre Pier from the licensed property.

The monthly dose from Site 1 and Site 2 are based on monitoring results for each dose component as shown in Table 12.

Table 12

Quarterly Dose (mSv/quarter)					
ORL Component	**Q1 2021**	**Q2 2021**	**Q3 2021**	**Q4 2021**	**YTD 2021**
Air	<0.001	<0.001	-	-	<0.001
Water	<0.001	<0.001	-	-	<0.001
Gamma – Site 1	0.008	0.024	-	-	0.032
Gamma – Site 2	0.010	0.028	-	-	0.038
Quarterly Dose – Site 1	0.008	0.025	-	-	0.032
Quarterly Dose – Site 2	0.010	0.029	-	-	0.039

Gamma Monitoring

As per the 2016 ORL, dose to the public is calculated for both sites 1 and 2 using specific gamma fenceline monitoring locations. The results at stations 2 and 10 (as of July 1, 2019) are used for Site 1 public dose calculations and the results at stations 2 and 21 are used for Site 2 public dose calculations. The results at these locations for this quarter are summarized and compared with regulatory action levels in Table 13.

There were no monthly gamma radiation action levels exceeded during the second quarter.

Table 13

Second Quarter 2021 Public Dose Gamma Monitoring Results					
Station Number	**April**	**March**	**June**	**Action Level (µSv/h)**	**Licence Limit (µSv/h)**
2	0.28	0.28	0.28	0.480	0.570
10	0.05	0.06	0.10	0.480	0.610
21	0.08	0.08	0.10	0.330	0.260

Air Emissions

The quarterly average and maximum stack emissions from the UF_6 plant main stack and the UO_2 plant main stack are presented in Table 14.

A stack monitoring program is used to determine the airborne uranium emission rates on a daily basis from the main stacks of the UF_6 and UO_2 plants.

No licensed action levels were exceeded for uranium emissions from the UF_6 plant main stack in the quarter. The UF_6 main stack average uranium emission rate is comparable to previous quarters when production was operational.

No licensed action levels were exceeded for uranium emissions from the UO_2 plant main stack in the quarter. The UO_2 main stack average uranium emission rate is consistent with previous quarters during which production was operational.

Fluoride emissions from the UF_6 main stack are sampled and analyzed on a continuous basis using an on-line analyzer and the data is collected on the plant computer system. No licensed action levels were exceeded for fluoride emissions from the UF_6 plant main stack in the quarter. The UF_6 main stack average fluoride emission rate is consistent with previous quarters during which production was operational.

The UO_2 main stack is also continuously sampled for ammonia. No licensed action levels were exceeded for ammonia emissions from the UO_2 plant main stack in the quarter. The UO_2 main stack average ammonia emission rate is consistent with previous quarters in which production was operational.

The depleted circuit was not operated in the second quarter 2021.

Table 14

Daily Main Stack Emissions by Quarter									
Plant	**Parameter**	**Licence Limit**	**Action Level**	**Value**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
UF_6	Uranium g U/h	280	40	Quarterly Daily Average	2.5	2.1	2.9	2.8	2.6
				Quarterly Daily Maximum	7.7	7.0	8.2	6.0	4.7
	Hydrogen Fluoride g HF/h	650	230	Quarterly Daily Average	23	29	34	29	27
				Quarterly Daily Maximum	139	273	137	155	88
UO_2	Uranium g U/h	240	10	Quarterly Daily Average	0.6	0.4	0.6	0.6	0.4
				Quarterly Daily Maximum	1.1	1.5	2.5	1.6	2.3
	Ammonia kg NH_3/h	58	10	Quarterly Daily Average	1.9	1.7	2.2	2.3	2.2
				Quarterly Daily Maximum	3.5	4.4	4.9	4.4	5.1

Liquid Discharges

Production facility cooling water return quality data is summarized in Table 15 and Table 16.

As the PHCF operates a once-through non-contact cooling water system, harbour water supply quality influences cooling water return quality under normal operating conditions. Ambient water quality can fluctuate based on near-shore Lake Ontario currents, seasonal weather patterns, harbour remedial work and outer harbour sedimentation among other items. The Canadian Nuclear Laboratories (CNL) wave attenuator immediately north of the PHCF intake further has the potential to impact the deposition of suspended solids in the outer harbour area and immediate vicinity of the end-of-pipe PHCF intake.

To that end, the PHCF had experienced increased rates of intake screen panel fouling from algae and other suspended solids in 2020 relative to prior calendar years. The harbour water supply challenges also impacted production facility operations in some

instances. A number of mitigating actions were implemented, including the operation of temporary water intakes from within the CNL harbour enclosure with discharge to the intake structure gap between the external screen panels and the harbour wall to supplement the outer harbour surface water supply.

Slight increases in fourth quarter 2020 baseline uranium concentrations at the production facility cooling water returns relative to the prior two quarters were associated with the supplemental harbour water supply pumping arrangement operations. Uranium trending decreased to baseline conditions in January and February 2021, followed by a minor increase in trending in March and April 2021, which influenced the first and second quarter 2021 daily maximum results. The supplemental harbour water supply was not in operation during this March to April period. Moreover, daily maximum results from the first and second quarters have been reported below the Canadian Council of Ministers of the Environment (CCME) water quality guideline of 15 µg U/L (long-term).

Due to sample matrix interferences, ammonia+ammonium sample analyses included a revised method detection limit of 0.014 mg/L as of the first quarter of 2020. Ammonia results recorded since that time have been influenced by the revised detection limit.

Table 15

UO_2N Water Quality Data by Quarter							
Parameter	**Units of Measure**	**Value**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Uranium	µg U/L	Average	3.3	3.2	6.6	5.8	5.4
		Maximum	5.8	9.1	10	12	12
Fluoride	mg F/L	Average	0.11	0.090	0.077	0.064	0.069
		Maximum	0.15	0.21	0.13	0.085	0.10
Ammonia & Ammonium	mg N/L	Average	0.014	0.021	0.015	0.014	0.014
		Maximum	0.014	0.30	0.077	0.014	0.014
Nitrate	mg N/L	Average	0.80	0.49	0.91	1.2	0.80
		Maximum	1.3	1.5	1.6	1.6	1.6
pH	-	Minimum	8.16	7.98	7.87	8.14	8.14
		Maximum	8.50	8.33	8.38	8.36	8.40

Table 16

UO_2S Water Quality Data by Quarter							
Parameter	**Units of Measure**	**Value**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Uranium	µg U/L	Average	3.4	3.1	7.0	6.1	5.8
		Maximum	6.1	7.1	11	13	14
Ammonia & Ammonium	mg N/L	Average	0.014	0.017	0.020	0.014	0.014
		Maximum	0.014	0.17	0.30	0.014	0.014
Nitrate	mg N/L	Average	0.81	0.50	0.94	1.3	0.84
		Maximum	1.3	0.66	1.6	1.8	1.6
pH	-	Minimum	8.18	8.03	7.89	8.20	8.21
		Maximum	8.50	8.37	8.47	8.42	8.44

In 2016 and early 2017, as part of the relicensing process, a daily sanitary sewer discharge action level of 100 µg U/L (0.10 mg U/L) and a monthly mean release limit of 275 µg U/L (0.275 mg U/L) were developed and accepted. Tables 17 and 18 summarize uranium concentrations and pH values recorded for the second quarter of 2021. No action level exceedances were recorded, and discharges remained well below the facility monthly mean release limit throughout the quarter.

Table 17

Sanitary Sewer Discharge Data by Quarter							
Parameter	**Units of Measure**	**Value**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Uranium	mg U/L	Average	0.016	0.0052	0.0065	0.0094	0.016
		Maximum	0.049	0.024	0.024	0.034	0.047
pH	-	Minimum	7.60	7.55	7.36	7.63	7.38
		Maximum	8.31	8.48	8.11	8.31	8.27

Table 18

Q2 2021 Monthly Sanitary Sewer Discharges			
Period	**Sanitary Sewer Action Level/Release Limit**	**Monthly Average Uranium Concentration (µg U/L)**	**Daily Maximum Uranium Concentration (µg U/L)**
April	Action Level of 100 µg U/L – daily composite samples Release Limit of 275 µg U/L – monthly average of daily composite samples	22	47
May		15	42
June		9.9	15

Ambient Air Monitoring

Table 19 shows the quarterly all-station average and maximum uranium dustfall results from the second quarter of 2020 through to the second quarter of 2021.

No uranium dustfall results exceeded the internal administrative screening level in the second quarter. The average uranium in dustfall results in the second quarter of 2021 were consistent with the uranium in dustfall averages during the previous quarters.

Table 19

Uranium in Dustfall Results by Quarter (mg U/m^2/30 days)					
Value	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Average	0.1	0.1	0.1	<0.1	<0.1
Maximum	0.3	0.2	0.2	0.1	0.1
Internal Administrative Screening Level = 10 mg U/m^2/30 days					

Table 20 summarizes the average and maximum uranium hi-vol results from the second quarter of 2020 through to the second quarter of 2021.

Average and maximum results for the quarter are below regulatory criteria. The average results for the Marsh Street, Waterworks, Hayward Street and Shuter Street stations are comparable to levels observed in the previous quarters.

Table 20

Uranium-in-Air Concentration at Hi-Vol Stations by Quarter (µg U in TSP/m^3)					
Quarter	**Result**	**Waterworks**	**Shuter Substation**	**Marsh Street**	**Hayward Street**
Q2 2020	Average	0.001	0.001	0.003	0.002
	Maximum	0.007	0.008	0.018	0.010
Q3 2020	Average	0.001	0.001	0.003	0.002
	Maximum	0.004	0.008	0.076	0.005
Q4 2020	Average	0.001	0.001	0.005	0.001
	Maximum	0.007	0.005	0.221	0.005
Q1 2021	Average	0.001	0.001	0.002	0.001
	Maximum	0.005	0.003	0.012	0.009
Q2 2021	Average	0.002	0.001	0.004	0.002
	Maximum	0.025	0.004	0.071	0.007
Average <0.06 µg U in TSP/m^3 (annual) AAQC Maximum <0.3 µg U in TSP/m^3 (24 hr) AAQC					

Table 21 shows the quarterly all-station average and maximum fluoride dustfall results from the second quarter of 2020 through to the second quarter of 2021.

The average fluoride in dustfall results in the second quarter of 2021 is consistent with fluctuations observed in the previous quarters.

Table 21

Fluoride in Dustfall Results by Quarter (mg F/m^2/30 days)					
Value	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Average	1.1	1.1	1.4	1.3	1.2
Maximum	9.6	6.9	8.1	9.4	8.3
Internal Administrative Screening Level = 20 mg F/m^2/30 days					

Table 22 shows the average and maximum lime candle results from the second quarter of 2020 through to the second quarter of 2021. The average results are comparable to levels observed in the previous quarters.

Table 22

Monthly Lime Candle Results by Quarter (µg F/100 cm²/30 days)					
Value	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Average	3	4	2	3	5
Maximum	8	13	5	8	13
The desirable ambient air quality criteria for lime candles are to protect forage crops consumed by livestock. During the summer growing season, the criteria is 40µg F/100cm²/30 days, changing to 80µg F/100cm²/30 days in winter					

Ambient Water Quality Monitoring

A summary of SCI water quality data is presented in Table 23. As noted in the UO_2N and UO_2S discussion text, ambient water quality can fluctuate based on near-shore Lake Ontario currents, seasonal weather patterns, harbour remedial work and outer harbour sedimentation among other items. The CNL wave attenuator immediately north of the PHCF intake further has the potential to impact the deposition of suspended solids in the outer harbour area and immediate vicinity of the end-of-pipe PHCF intake.

Slight increases in fourth quarter 2020 baseline uranium concentrations at the production facility cooling water returns relative to the prior two quarters were associated with the supplemental harbour water supply pumping arrangement operations. Uranium trending decreased to baseline conditions in January and February 2021, followed by a minor increase in trending in March and April 2021, which influenced the first and second quarter 2021 daily maximum results. The supplemental harbour water supply was not in operation during this March to April period. Moreover, daily maximum results from the first and second quarters have been reported below the Canadian Council of Ministers of the Environment (CCME) water quality guideline of 15 µg U/L (long-term).

Ammonia results have otherwise been influenced by the revised method detection limit implemented in the first quarter of 2020.

Table 23

SCI Water Quality Data by Quarter							
Parameter	**Units of Measure**	**Value**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**
Uranium	µg U/L	Average	3.4	3.3	7.0	6.0	5.7
		Maximum	5.9	7.3	12	14	12
Fluoride	mg F/L	Average	0.10	0.085	0.080	0.061	0.066
		Maximum	0.15	0.13	0.14	0.074	0.11
Ammonia & Ammonium	mg N/L	Average	0.014	0.017	0.014	0.014	0.014
		Maximum	0.014	0.14	0.044	0.014	0.014
Nitrate	mg N/L	Average	0.81	0.53	0.98	1.3	0.87
		Maximum	1.2	1.5	1.7	1.8	1.7
pH	-	Minimum	8.21	8.05	7.75	8.01	7.71
		Maximum	8.50	8.43	8.36	8.39	8.44

Cooling Water Intake – Visual Inspections

Table 24 below presents all non-conformities observed during daily visual inspections of the cooling water intake system. Overall, the cooling water intake fish protection system remained effective.

Table 24

Date	**Quantity of Fish Observed**	**Observations**
There were no non-conformities observed during daily visual inspections of the cooling water intake system in the second quarter.		

5.0 Public Information Program

During the second quarter of 2021, PHCF continued to meet the requirements of CNSC RD/GD 3.2.1, Public Information and Disclosure programs.

Public Engagement

Throughout April, three cases of COVID-19 were identified at the PHCF. Statements were posted online and to Cameco Ontario social media channels.

On May 6, employees from Cameco attended the Northumberland Manufacturers Association Virtual Career Day. The virtual Cameco table had 14 visitors including students, recruiters and industry members looking for more information on Cameco operations and potential job openings.

Cameco began promoting the virtual Step Up for Mental Health event during the month of May. The event will take place virtually from October 1 to 6, and all funds raised from Ontario participants will contribute to the existing Cameco Fund for Mental Health in Northumberland County. Cameco issued a news release to local media and posted the release to the website.

In late May and early June, approximately 325 Port Hope residents were contacted by Fast Consulting for the annual public opinion poll. The survey was promoted on social media to inform residents they may receive a call. The survey results will be available in Q3.

In June, Cameco sponsored the Northumberland United Way Week of Caring to raise funds for Northumberland Eats. Cameco also sponsored the Ride for Rebound cycling event raising money for Rebound Child and Youth Services.

Cameco provided free advertising to local charitable organizations with its sponsorship of MyFMs Community Partner Program. Through the quarter, Sounds of the Next Generation, Rebound Child and Youth Services, and Habitat for Humanity benefitted from this sponsorship by receiving advertising.

Public Disclosure

Cameco's PHCF made two public disclosures during the second quarter. Both involved environmental releases and both scenarios did not pose a health or safety risk to the public or the environment.

Environment & Safety - Conversion: Port Hope - Fuel Services - Businesses - Cameco

Social Media

Cameco Ontario's Facebook community grew by 29 new followers (949 total) and had a total of 921 page likes at the end of the quarter. Cameco Ontario's 20 posts covered information such as:

- Updates on COVID-19 cases at CFM and PHCF
- Industry news from Bruce Power
- International Women's Day
- Cameco Fuel Manufacturing licence renewal application
- Job postings at Ontario facilities
- The release of the spring issue of Energize
- Informing the community about an emergency response exercise that took place at PHCF
- Sharing the results of a CNSC independent environmental monitoring report for Blind River and Port Hope
- Promotions for community partners and sponsorships.

By the end of the quarter the Instagram account had grown by 35 new followers for a total of 546 followers. Photos and information featured was similar to the Cameco Ontario Facebook account.

Indigenous Engagement

In April, Cameco emailed the 2020 Annual Compliance Report and Spring 2021 Energize newsletter to Alderville, Hiawatha, Curve Lake, Scugog Island and Rama First Nations.

Cameco's communications manager and the director of compliance met with Curve Lake First Nation on April 28, May 26 and June 30. Cameco provided information about its operational activities. Cameco and Curve Lake First Nation continue to meet regularly and discuss areas of interest. Cameco emailed Curve Lake First Nation a copy of the June 3 public disclosure.

Website

Three statements regarding positive COVID-19 cases were posted to the website:

- Port Hope Conversion Facility Assumed Positive Case - News Archive - Media - Cameco Fuel Services

- Port Hope Conversion Facility Positive Case - News Archive - Media - Cameco Fuel Services
- Positive Case at Port Hope Conversion Facility - News Archive - Media - Cameco Fuel Services

One news release was posted to the website:

- Step Up for Mental Health Run Goes Virtual - News Archive - Media - Cameco Fuel Services

A notice regarding Temporary Pump Installation which was originally posted to the website on September 24, 2020, was updated on October 15, 2020, December 1, 2020, March 1, 2021 and June 30, 2021.

- Port Hope Conversion Facility – Extension of Temporary Harbour Water Supply - News Archive - Media - Cameco Fuel Services (note that this link will only show the most recent posting).

Media Analysis

Cameco received media coverage regarding the Step Up for Mental Health run, Week of Caring and the Mission to Mars Competition:

- **Cameco – Step Up for Mental Health Run Goes Virtual**
  Todays Northumberland – May 13, 2021
  - https://todaysnorthumberland.ca/2021/05/13/cameco-step-up-for-mental-health-run-goes-virtual/
- **Cobourg students part of winning virtual 'Mission to Mars Competition'**
  Northumberland News – May 19, 2021
  - https://www.northumberlandnews.com/community-story/10394009-cobourg-students-part-of-winning-virtual-mission-to-mars-competition-/
- **'Week of Caring for Northumberland Eats' supports food voucher program amid COVID-19**
  Northumberland News – June 3, 2021
  - https://www.northumberlandnews.com/news-story/10408381--week-of-caring-for-northumberland-eats-supports-food-voucher-program-amid-covid-19/
- **Northumberland raises $19,250 for Northumberland Eats through Week of Caring**
  Northumberland News – June 16, 2021

- https://www.northumberlandnews.com/news-story/10416964-northumberland-raises-19-250-for-northumberland-eats-through-week-of-caring/

Communication Products

One news release was issued to local media and posted to the website: Step Up for Mental Health Run Goes Virtual - News Archive - Media - Cameco Fuel Services

6.0 Other Matters of Regulatory Interest

6.1 Vision in Motion

Vision in Motion (VIM) engineering activities continued for site-wide infrastructure, demolition of Building 27 with the exception of cylinder preparation and drum storage, the deep excavation and future demolition of buildings and equipment. On-site project activities continued to be substantially curtailed throughout this quarter as part of the Cameco response to provincial COVID-19 emergency orders that were in early in the year. Planning to remobilize some project resources in the third quarter was underway.

Minor activities were underway at the south end of the facility (area of the new hydrogen station) to support commissioning of the hydrogen station.

Mobilization of the Building 27 demolition contractor that has been initiated at the end of March was put on hold until later in the year to continue to limit the size of the workforce at PHCF to control COVID-19.

CNL stopped accepting packed waste material from Cameco until late in the year when capacity for these materials is expected to be available in a new waste cell that is currently under construction at the Long-Term Waste Management Facility.

A special circumstance application was received from CNL related to a deviation to remediation verification of the underground tanks at the former waterworks property. It is planned to transfer the property that is subject to the special circumstance to the Municipality of Port Hope as part of a land transfer already in progress. CNL resumed some restoration activities late in the quarter.

Regular monthly coordination meetings with the MPH and Cameco in relation to VIM activities continued. A proposed agreement for remediation of municipal properties remained on hold while the MPH addressed questions and issues related to post-remediation regulatory requirements at the Centre Pier property with CNL and AECL.

Agreements between Cameco and the MPH progressed needed to support the proposed change to the VIM scope that would eliminate the need for the Choate St. extension. These changes were under review by the MPH through the quarter.

The Supplementary Environmental Monitoring Plan for Vision in Motion and Other Clean-Up Program Projects was developed to monitor environmental impacts for the VIM activities, primarily during demolition/excavation. There were no environmental monitoring exceedances/reportable events occurred in the second quarter related to VIM activities.

7.0 Concluding Remarks

Cameco is committed to the safe, clean, and reliable operations of all its facilities and continually strives to improve safety performance and processes to ensure the safety of both its employees and the people in neighbouring communities.

In the second quarter of 2021, PHCF did not exceed any CNSC regulatory limits. As a result of the effective programs, plans and procedures in place, the PHCF was able to maintain individual radiation exposures well below all regulatory dose limits. In addition, environmental emissions continued to be controlled to levels that are a fraction of the CNSC regulatory limits, and public radiation exposures are also well below the regulatory limits.

PHCF's ALARA program continued to be effective in the second quarter of 2021. There were no site action levels exceeded and all site exposures and emissions were well below PHCF site limits.

Cameco's relationship with local residents remains strong and we are committed to maintaining the strong support and trust we have developed over the past several years.