U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No.: 50-220/92-23
50-410/92-26

Docket No.: 50-220; 50-410

License No.: DPR-63, NPF-69

Licensee: Niagara Mohawk Power Corporation
301 Plainfield Road
Syracuse, New York 13212

Facility Name: Nine Mile Point, Units 1 and 2

Inspection At: Scriba, New York

Inspection Conducted: August 31 - September 4, 1992

Inspectors: _____ 9/22/
N. T. McNamara, Laboratory Specialist — date
Effluents Radiation Protection Section (ERPS)

_____ 9-22-92
J. J. Kottan, Sr. Laboratory Specialist, ERPS — date
Facilities Radiological Safety and Safeguards
Branch (FRSSB)

Approved By: Marie T. Miller 9-22-92
M. T. Miller, Chief, ERPS, FRSSB — date
Division of Radiation Safety and Safeguards

Areas Inspected: Unannounced inspection of the radiological and non-radiological chemistry programs. Areas reviewed included: Confirmatory Measurements - Radiological, Standards Analyses - Chemistry, Laboratory QA/QC, and Audits.

Results: The licensee had in place effective programs for measuring radioactivity in process and effluent samples and for measuring chemical parameters in plant systems. No violations or deviations were observed.

DETAILS

1.0 Individuals Contacted

Principal Licensee Employees

* J. Blasiak, Manager, Unit 2 Chemistry
* J. Burton, Manager, QA
* J. Clark, Generation Engineer, Unit 2 Chemistry
  W. Connoly, QVSA Supervisor, Unit 2
* J. Conway, Acting Plant Manager, Unit 2
  J. Doyle, QVSA Supervisor, Unit 1
* B. Holloway, Generation Engineer, Unit 1 Chemistry
* R. Magnant, Site Licensing
* J. Perry, Vice President, NQA
* N. Rodemacher, Acting Plant Manager, Unit 1
* C. Senska, Acting Manager, Unit 1 Chemistry
  W. Wambsgam, QA Supervisor

NRC Employees

R. Laura, Resident Inspector
W. Mattingly, Resident Inspector

* Denotes those present at the exit meeting on September 4, 1992. The inspectors also interviewed other licensee personnel, including members of the chemistry and radiation protection staff.

2.0 Purpose

The purpose of this inspection was to review the following areas.

1. The licensee's ability to measure radioactivity in plant systems samples and effluent samples, and the ability to measure chemical parameters in various plant systems samples.

2. The licensee's ability to demonstrate the acceptability of analytical results through implementation of a laboratory QA/QC program.

3.0 Laboratory Organization and Operation

Each unit at the Nine Mile Point site had a dedicated chemistry laboratory and dedicated gamma spectroscopy systems. The chemistry laboratories were similarly equipped with the exception of the plasma emission spectrometer (ICP) which was located in the Unit 1 laboratory. All site metal analyses were performed using this ICP. The laboratory of

each unit operated under the direction of a chemistry manager, who in turn reported to the respective unit superintendent.

The data listed in Tables I and II identify which counting facility (and detector) or which laboratory was used for the sample analyses.

4.0 Radiological and Chemical Measurements

4.1 Confirmatory Measurements - Radiochemistry

During this part of the inspection, liquid, airborne particulate (filter) and iodine (charcoal cartridge), and gas samples were analyzed by the licensee's chemistry department and the NRC for the purpose of intercomparison. The samples were actual split samples with the exception of the particulate filters and offgas samples. In those cases the samples could not be split and the same samples were analyzed by the licensee and the NRC. Where possible, the samples were actual effluent samples or in-plant samples which duplicated the counting geometrics used by the licensee for effluent sample analyses. The samples were analyzed by the licensee using routine methods and equipment and by the NRC Region I Mobile Radiological Measurements Laboratory. Joint analyses of actual effluent samples were used to verify the licensee's capability to measure radioactivity in effluent and other samples with respect to Technical Specifications and other regulatory requirements.

In addition, a liquid sample was sent to the NRC reference laboratory, Department of Energy, Radiological and Environmental Sciences Laboratory (RESL), for analyses requiring wet chemistry. The analyses to be performed on the sample are Sr-89, Sr-90, Fe-55, H-3 and gross alpha. The results of these analyses will be compared with the licensee's results when received at a later date and will be documented in a subsequent inspection report. The results of a liquid sample split between the licensee and the NRC during a previous inspection on July 23-27, 1990 (Combined Inspection Report Nos. 50-220/90-20 and 50-410/90-19) were also compared during this inspection.

The licensee's Radiation Protection Department possessed a gamma spectrometry system which was used to quantify radioactivity on in-plant samples for radiation protection purposes. During this inspection, the charcoal cartridge and particulate filter were also analyzed by the licensee's Radiation Protection Department and compared with NRC results. These types of samples were those normally analyzed by the licensee's Radiation Protection Department.

The results of the comparisons for all of the above samples, which are presented in Table I, indicated that all of the measurements were in agreement under the criteria for comparing results (see Attachment 1 to Table I) with the exception of

the Fe-55 and the H-3 results for the liquid sample split during the previous inspection. The specific reason for the Fe-55 and H-3 disagreement could not be determined during this inspection. However, as stated above, a liquid sample was split for Fe-55 and H-3 analyses during this inspection, and these results will be compared as soon as received in order to resolve this discrepancy. Some possible reasons for the Fe-55 disagreement could be a poor sample split or a matrix effect present in the sample. Additional precautions were taken and new techniques employed during this inspection in order to ensure and verify a good sample split. Additionally, the results from the particulate filter analyses indicated that the filters are subject to distortion when dried and placed into the petri dish prior to counting. The inspector discussed this matter with the licensee, and the licensee stated that this area would be reviewed and appropriate action taken to ensure a consistent reproducible counting geometry. No safety concerns or violations were identified in this area.

4.2 Standard Analyses - Chemical

During this part of the inspection, standard chemical solutions were submitted to the licensee for analysis. The standards were prepared by Oak Ridge National Laboratory (ORNL) for the NRC and were analyzed by the licensee using routine methods and equipment. The analysis of standards is used to verify the licensee's capability to monitor chemical parameters in various plant systems with respect to Technical Specifications and other regulatory requirements. In addition, the analysis of standards is used to evaluate the licensee's procedures with respect to accuracy and precision. The standards were submitted to the licensee for analysis in triplicate at three concentrations spread over the licensee's normal calibration and analysis range. The boron analyses were performed in duplicate due to the lack of sufficient volume of the NRC standard. Also, the boron analyses were performed at only two concentrations because one of the NRC boron standards was below the licensee's normal analysis range.

A condensate demineralizer sample was spiked with a standard anion solution and sent to ORNL for analysis. The analyses to be performed on the sample are chloride, fluoride, and sulfate. The licensee will perform the same analyses on an aliquot of this spiked sample. The results of these analyses will be compared when received at a later date and will be documented in a subsequent inspection report. The analysis of spiked samples permits comparisons from an actual sample matrix.

The results of the standard measurements comparisons indicated that all of the measurements were in agreement or qualified agreement under the criteria used for comparing results (see Attachment 1 to Table II). The Unit 2 anion data were reanalysis results and, because of time constraints, were analyzed in duplicate only. The original Unit 2 anion analysis results indicated that the Unit 2 ion

chromatography system (IC) reagents had become contaminated with chloride and sulfate anions. The Unit 2 chemistry laboratory was a small laboratory which also included the Unit 2 gamma spectrometry systems. Due to the small size of this facility, it is difficult to set aside areas for specific analyses, such as low level anions, and prevent contamination from other laboratory activities. The inspector discussed this matter with the licensee. The licensee stated that in the future some laboratory activities would be moved to another facility in order to help alleviate this situation. The inspector stated that this area would be reviewed during a subsequent inspection in this area. The data are presented in Table II.

5.0 Laboratory QA/QC

The inspector reviewed the licensee's laboratory QA/QC program. The program was described in Procedure S-CAD-CHE-0102, Analytical Quality Assurance Program. This procedure provides for both an intralaboratory and an interlaboratory QC program. The intralaboratory program consisted of instrument and procedure control charts for trending performance, and the interlaboratory program consisted of the analysis of unknown samples from outside laboratories for both chemical and radiochemical constituents. These spiked samples were also used by the licensee as technician proficiency checks. Included in the interlaboratory program was the vendor laboratory utilized by the licensee for performing selected radiochemical analyses of effluent samples. Additionally, the procedure contained detailed instructions for the preparation and use of control charts.

The inspector reviewed selected data generated by the licensee's laboratory QC program for 1991 and 1992 to date and noted that the licensee appeared to be implementing the program as required. In reviewing the above data the inspector noted that the licensee trended the chemical analyses interlaboratory results but not the radiochemical results. In addition, the inspector noted that some of the radiochemistry interlaboratory QC samples were not counted promptly, and had, in fact, decayed to less than detectable levels. Also, some radionuclides were reported as present in the QC samples when they were not because of misidentified photopeaks. These types of results were reported as disagreements by the offsite laboratory. The inspector discussed the need for detailed review of the data generated by the interlaboratory radiochemistry cross-check program with the licensee. The licensee stated that the area would be reviewed and appropriate corrective action taken. Finally, the inspector noted that the instrument and procedure control charts which were maintained in the laboratory were used by the chemistry technicians on a real-time basis and provided good control of the measurement processes. The inspector stated that this was a noted strength in the laboratory QC program. No safety concerns or violations were identified in this area.

6.0 Surveillance and Audit Activities

The inspector reviewed selected surveillance activities of the chemistry area for 1991 and 1992 to date. The licensee performed both scheduled and unscheduled surveillances of

the chemistry area. The surveillances were performed using comprehensive checklists and the findings were described in detail. In addition, an annual summary of surveillance activities was prepared by the Quality Verification and Safety Assessment Groups.

The inspector also reviewed QA Audit No. 91017-RG/IN, "Radiological and Chemistry Controls", which was performed on November 4-15, 1991. This audit, which was performance based, was conducted using a detailed checklist, had comprehensive comments on each reviewed area, and the audit team included a technical specialist. Of particular note in this audit were the chemical and radiochemical samples which were split between the Unit 1 and Unit 2 laboratories. The inspector stated that introduction of actual sample analyses into the audit process was an excellent initiative on the part of the licensee.

The inspector noted that the above audits and surveillances appeared to provide adequate independent oversight and assessment of chemistry activities. No safety concerns or violations were identified in this area.

7.0 Exit Meeting

The inspector met with the licensee representatives listed in Section 1.0 at the conclusion of the inspection on September 4, 1992. The inspector summarized the purpose, scope, and findings of the inspection.

TABLE I

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in microCuries per milliliter		
Waste Collector Tank 1436 hrs 09/03/92 (Unit 2, Detector 4)	Na-24	(2.4±0.2)E-6	(1.97±0.12)E-6	Agreement
	Cr-51	(6.5±0.2)E-5	(6.9±0.8)E-5	Agreement
	Mn-54	(1.48±0.04)E-5	(1.57±0.05)E-5	Agreement
	Co-58	(8.40±0.07)E-5	(8.5±0.3)E-5	Agreement
	Co-60	(1.280±0.009)E-4	(1.33±0.04)E-4	Agreement
Waste Collector Tank 1436 hrs 09/03/92 (Unit 1, Detector 1)	Na-24	(2.4±0.2)E-6	(1.94±0.11)E-6	Agreement
	Cr-51	(6.5±0.2)E-5	(6.7±0.3)E-5	Agreement
	Mn-54	(1.48±0.04)E-5	(1.54±0.05)E-5	Agreement
	Co-58	(8.4±0.07)E-5	(8.5±0.2)E-5	Agreement
	Co-60	(1.280±0.009)E-4	(1.34±0.04)E-4	Agreement

TABLE I - continued

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in Total Microcuries		
Main Stack Charcoal Cartridge 1947 hrs 08/26/92 (Unit 1, Detector 1)	I-131	(3.2±0.3)E-4	(3.0±0.2)E-4	Agreement
Main Stack Charcoal Cartridge 1947 hrs 08/26/92 (Unit 2, Detector 4)	I-131	(3.2±0.3)E-4	(3.2±0.4)E-4	Agreement
Main Stack Charcoal Cartridge 1947 hrs 08/26/92 (Rad Protection) (Detector 6)	I-131	(3.2±0.3)E-4	(3.4±0.2)E-4	Agreement

TABLE I - continued

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in microCuries per milliliter		
Reactor Water Anion Filter 0330 hrs 09/01/92 (Unit 1, Detector 1)	I-131 I-133	(1.57±0.07)E-5 (2.53±0.08)E-4	(1.74±0.10)E-5 (3.18±0.12)E-4	Agreement Agreement
Reactor Water Anion Filter 0330 hrs 09/01/92 (Unit 2, Detector 5)	I-131 I-133	(1.57±0.07)E-5 (2.53±0.08)E-4	(1.70±0.07)E-5 (2.94±0.12)E-4	Agreement Agreement
Reactor Water Anion Filter 0330 hrs 09/01/92 (Rad Protection) (Detector 6)	I-131 I-133	(1.57±0.07)E-5 (2.53±0.08)E-4	(1.68±0.07)E-5 (3.00±0.11)E-4	Agreement Agreement

TABLE I - continued

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in microCuries per milliliter		
Reactor Water Cation Filter 0330 hrs 09/01/92 (Unit 1, Detector 1)	Na-24	(8.2±0.7)E-5	(8.7±0.5)E-5	Agreement
	Co-58	(1.150±0.014)E-4	(1.35±0.04)E-4	Agreement
	Co-60	(1.30±0.02)E-4	(1.45±0.05)E-4	Agreement
Reactor Water Cation Filter 0330 hrs 09/01/92 (Unit 2, Detector 5)	Na-24	(8.2±0.7)E-5	(1.01±0.07)E-4	Agreement
	Co-58	(1.150±0.014)E-4	(1.38±0.04)E-4	Agreement
	Co-60	(1.30±0.02)E-4	(1.53±0.04)E-4	Agreement
Reactor Water Cation Filter 0330 hrs 09/01/92 (Rad Protection) (Detector 1)	Na-24	(8.2±0.7)E-5	(7.0±0.4)E-5	Agreement
	Co-58	(1.150±0.014)E-4	(1.16±0.03)E-4	Agreement
	Co-60	(1.30±0.02)E-4	(1.27±0.04)E-4	Agreement

TABLE I - continued

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in microCuries per milliliter		
Reactor Water 0913 hrs 09/02/92 2 hour decay (Unit 1, Detector 1)	I-132	(1.11±0.05)E-3	(1.29±0.07)E-3	Agreement
	I-134	(3.2±0.2)E-3	(4.1±0.2)E-3	Agreement
	I-135	(8.7±0.8)E-4	(8.7±0.9)E-4	Agreement
Reactor Water 0913 hrs 09/02/92 24 hour decay (Unit 1, Detector 1)	I-131	(1.74±0.13)E-5	(2.2±0.3)E-5	Agreement
	I-133	(3.00±0.04)E-4	(3.31±0.15)E-4	Agreement
	I-135	(9.0±0.5)E-4	(9.3±0.8)E-4	Agreement
Reactor Water 0913 hrs 09/02/92 2 hour decay (Unit 2, Detector 4)	I-132	(1.11±0.05)E-3	(1.31±0.08)E-3	Agreement
	I-134	(3.2±0.2)E-3	(4.5±0.2)E-3	Agreement
	I-135	(8.7±0.8)E-4	(9.2±0.9)E-4	Agreement
Reactor Water 0913 hrs 24 hour decay (Unit 2, Detector 5)	I-131	(1.74±0.13)E-4	(1.84±0.13)E-5	Agreement
	I-133	(3.00±0.04)E-4	(3.25±0.13)E-4	Agreement
	I-135	(9.0±0.5)E-4	(9.2±0.6)E-4	Agreement

TABLE I - continued

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in microCuries per milliliter		
Condenser Offgas	Kr-85m	(6.0±0.3)E-4	(5.0±0.5)E-4	Agreement
1412 hrs	Kr-87	(2.8±0.2)E-3	(3.8±0.3)E-3	Agreement
09/02/92	Kr-88	(1.90±0.11)E-3	(2.2±0.2)E-3	Agreement
1 hour decay	Xe-133	(8.4±0.5)E-4	(8.0±0.8)E-4	Agreement
(Unit 1, Detector 1)	Xe-135	(3.27±0.06)E-3	(3.4±0.2)E-3	Agreement
Condenser Offgas	Kr-85m	(6.3±0.3)E-4	(6.4±0.3)E-4	Agreement
1412 hrs	Kr-87	(3.2±0.2)E-3	(3.3±0.2)E-3	Agreement
09/02/92	Kr-88	(2.11±0.12)E-3	(2.24±0.12)E-3	Agreement
4 hour decay	Xe-133	(7.0±0.2)E-4	(8.0±0.5)E-4	Agreement
(Unit 1, Detector 1)	Xe-135	(3.51±0.04)E-3	(3.58±0.15)E-3	Agreement
Condenser Offgas	Kr-85m	(6.7±0.2)E-4	(6.1±0.3)E-4	Agreement
1449 hrs	Kr-87	(3.0±0.2)E-3	(2.8±0.2)E-3	Agreement
09/02/92	Kr-88	(2.16±0.07)E-3	(2.07±0.12)E-3	Agreement
4 hour decay	Xe-133	(6.7±0.2)E-4	(7.2±0.5)E-4	Agreement
(Unit 2, Detector 4)	Xe-135	(3.43±0.03)E-3	(3.13±0.13)E-3	Agreement

TABLE I - continued

Nine Mile Point Units 1 and 2 Verification Test Results

SAMPLE	ISOTOPE	NRC VALUE	LICENSEE VALUE	COMPARISON
		Results in microCuries per milliliter		
Liquid Radioactive	Fe-55	(3.52±0.01)E-4	(1.0±0.1)E-4	Disagreement
Waste Tank 1A	gross alpha	(-2±4)E-8	<2.7E-8	No Comparison
1445 hrs	H-3	(1.20±0.01)E-3	(2.0±0.1)E-3	Disagreement
07/25/90	Sr-89	(5.3±0.7)E-7	(3.3±0.3)E-7	Agreement
	Sr-90	(1.6±0.4)E-8	<5.8E-9	No Comparison

Note: Reported uncertainties are one standard deviation counting uncertainties for both licensee and NRC results.

ATTACHMENT 1 TO TABLE 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

Resolution[1]	Ratio for Agreement[2]
<4	No comparison
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
>200	0.85 - 1.18

1.Resolution = (NRC Reference Value/Reference Value Uncertainty)

2.Ratio = (Licensee Value/NRC Reference Value)

TABLE II

Nine Mile Point Units 1 and 2 Chemistry Test Results

Chemical Analysis	Method of Analysis	NRC Known Value	Licensee Value	Percent Difference	Comparison
		Results in parts per billion (ppb)			
Chloride (Unit 1)	IC	1.90±0.03	2.0970±0.0010	+10%	Qual Agree
		3.60±0.12	3.92±0.06	+9%	Qual Agree
		7.5±0.3	7.9±0.2	+5%	Agreement
Chloride (Unit 2)	IC	3.80±0.06	[1]4.00±0.03	+5%	Agreement
		7.5±0.3	[1]7.64±0.06	+2%	Agreement
		15.1±0.6	[1]15.13±0.07	0%	Agreement
Fluoride (Unit 1)	ISE	20.2±1.0	18.8±0.2	-7%	Agreement
		40±3	36.8±0.7	-8%	Agreement
		85±5	79±2	-7%	Agreement
Fluoride (Unit 2)	IC	4.04±0.02	[1]4.036±0.003	0%	Agreement
		8.5±0.5	8.41±0.06	-1%	Agreement
		17.0±1.0	16.24±0.16	-4%	Agreement
Sulfate (Unit 1)	IC	1.94±0.03	2.01±0.09	+4%	Agreement
		3.88±0.08	4.022±0.007	+4%	Agreement
		7.9±0.2	8.2±0.2	+4%	Agreement

TABLE II - continued

Nine Mile Point Units 1 and 2 Chemistry Test Results

Chemical Analysis	Method of Analysis	NRC Known Value	Licensee Value	Percent Difference	Comparison
		Results in parts per billion (ppb)			
Sulfate (Unit 2)	IC	3.88±0.06	[1]4.106±0.005	+6%	Agreement
		7.9±0.2	[1]8.14±0.02	+3%	Agreement
		15.9±0.4	[1]15.93±0.13	0%	Agreement
Silica (Unit 1)	SP	15±2	13.2±0	-12%	Qual Agree
		28.4±0.4	27.3±0.4	-4%	Agreement
		60.1±1.0	60.2±0.6	0%	Agreement
Silica (Unit 2)	SP	15±2	12.8±0.3	-15%	Qual Agree
		28.4±0.4	27.0±0	-5%	Agreement
		60.1±1.0	61.0±0.4	+2%	Agreement
Boron (Unit 1)	T	3040±40	[1]3080±16	+1%	Agreement
		5060±80	[1]5083±13	0%	Agreement
Boron (Unit 2)	T	3040±40	[1]3096±10	+2%	Agreement
		5060±80	[1]5078±9	0%	Agreement
Iron	ICP	199±2	204±3	+2%	Agreement
		398±4	403±3	+1%	Agreement
		795±7	799±7	0%	Agreement

TABLE II - continued

Nine Mile Point Units 1 and 2 Chemistry Test Results

Chemical Analysis	Method of Analysis	NRC Known Value	Licensee Value	Percent Difference	Comparison
		Results in parts per billion (ppb)			
Copper	ICP	202±2	209±4	+3%	Agreement
		403±4	413±10	+2%	Agreement
		810±10	811±8	0%	Agreement
Nickel	ICP	199±2	208±6	+4%	Agreement
		400±4	407.3±0.6	+2%	Agreement
		800±8	802±7	0%	Agreement
Chromium	ICP	200±2	200±4	0%	Agreement
		402±4	400±3	0%	Agreement
		804±7	793.7±1.5	-1%	Agreement
Zinc	ICP	109±3	103±3	-6%	Agreement
		522±7	483±6	-8%	Agreement
		1030±10	1010±10	-2%	Agreement

IC = Ion Chomatography
ICP = Inductively Coupled Plasma Emission Spectrometry
ISE = Ion Specific Electrode
SP = UV-Vis Spectrophotometry
T = Titration with PHT endpoint

1.Duplicate analysis only

ATTACHMENT 2 TO TABLE II

Criteria for Comparing Analytical Measurements from Table II

This attachment provides criteria for comparing results of capability tests. In these criteria the judgement limits are based on data from Table 2.1 of NUREG/CR-5244, "Evaluation of Non-Radiological Water Chemistry at Power Reactors". Licensee values within the plus or minus two standard deviation range (±2Sd) of the ORNL known values are considered to be in agreement. Licensee values outside the plus or minus two standard deviation range but within the plus or minus three standard deviation range (±3Sd) of the ORNL known values are considered to be in qualified agreement. Repeated results which are in qualified agreement will receive additional attention. Licensee values greater than the plus or minus three standard deviations range of the ORNL known value are in disagreement. The standard deviations were computer using the average percent standard deviation values of each analyte in Table 2.1 of the NUREG.

The ranges for the data in Table II are as follows.

Analyte	Agreement Range	Qualified Agreement Range
Chloride	+ 8%	+ 12%
Fluoride	+ 12%	+ 18%
Sulfate	+ 10%	+ 15%
Silica	+ 10%	+ 15%
Chromium	+ 10%	+ 15%
Copper	+ 10%	+ 15%
Iron	+ 10%	+ 15%
Nickel	+ 6%	+ 9%
Boron	+ 2%	+ 3%
Zinc	+ 10%	+ 15%