An AREVA and Siemens company

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Supplement to Applicant's Environmental Report

October 2006

AREVA

EHS&L Document

Supplement to Applicant's Environmental Report

Nature of Changes

Item	Paragraph	Description	Justification
1.	Entire document	Complete revision to update with new environmental data collected since Version 1.0.	Required submittal for NRC license renewal.
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
List Below any Documents, including Forms & Operator Aids which must be issued concurrently with this document revision:			

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All new and/or revised procedures shall be approved by the change author, cognizant manager(s) of areas affected by the changes, and by applicable manager(s) of any function that approved the previous revision of the document unless responsibility for such approval has been transferred to another organization. Also, the procedure shall be approved by manager(s) of functional organizations that provide technical reviews with the exception of the Training Department. Finally, Document Control shall verify that the required approvals have been properly obtained and that any documents that must be issued concurrently are ready to be issued.

Minor Changes: If the proposed changes are limited to editorial and/or administrative changes check the box at the right. The document will be routed directly for review by EHS&L without technical review. All applicable approvals must still be obtained.	☐

Document Reviews			Document Approvals	
Purpose/Function of Review	Specify Reviewer(s) (Optional except for change author)	(Check all that apply)	Title of Approver	(Check all that Apply)
Document Control (Automatic)		☒	Document Control (Automatic)	☒
Change Author	JB Perryman	☒	Author	☒
Independent Technical Review	LJ Maas	☒		
Operability Review(s)			Mgr, Richland Operations[1]	☐
Conversion		☐	Mgr, Uranium Conversion & Recovery Operations[1]	☐
Recovery		☐		
Ceramics		☐	Mgr, Ceramic Operations[1]	☐
Rods		☐	Mgr, Rods & Bundles[1]	☐
Bundles		☐		
Transportation		☐		
Components		☐	Mgr, Component Fabrication[1]	☐
Maintenance Review		☐	Mgr, Maintenance[1]	☐
Lab Review		☐	Mgr, Analytical Services[1]	☐
EHS&L Review(s)			Mgr, EHS&L[2]	☒
Criticality		☐	Mgr, Criticality Safety[2]	☐
Radiation Protection	RK Burklin	☒	Mgr, Safety, Security & Emergency Preparedness[2]	☐
Safety/Security		☐		
Emergency Preparedness		☐		
MC&A		☐	Mgr, Licensing & Compliance[2]	☐
Transportation		☐		
Environmental	LJ Maas	☒		
BWR Product Eng. Review		☐	Mgr, BWR Product Engineering	☐
Quality Review		☐	Mgr, Quality	☐
Ops. Projects & Planning Review		☐	Mgr, Ops. Projects & Planning	☐
Others:		☐	Mgr, Richland Site/Other	☐
Training & Employee Dev.:[3]		☐	Training & Employee Dev.	☐

[1]Note: If approvals include 2 or more product center managers, the Operations manager can be substituted for the applicable product center managers.

[2]Note: If approvals include 2 or more EHS&L functional managers, the EHS&L manager can be substituted for the applicable EHS&L functional managers.

[3]Note: Training department review is required for all procedures that require or affect a Learning Plan and if additional training materials or curriculum must be revised before issuing procedure.

EHS&L Change Impact Evaluation Form		
Document / ECN No*.: E06-04-004		Change Evaluator: LJ Maas
Does the change potentially impact Criticality Alarm System (CAS) coverage?	☐ Yes ☒ No	If yes, explain:
NRC Pre-Approval Evaluation:		
Is NRC Pre-approval (License Amendment) Needed? (Based on "Yes" answer to any of five questions below). (Based on "No" answer to all five questions below).	☐ Yes ☒ No	
1. Does the change create new types of accident sequences that, unless mitigated or prevented, would exceed the performance requirements of 10 CFR 70.61 (create high or intermediate consequence events) and that have not previously been described in AREVA NP Inc's ISA Summary?	☐ Yes ☒ No	If yes, explain:
2. Does the change use new processes, technologies, or control systems for which AREVA NP Inc. has no prior experience?	☐ Yes ☒ No	If yes, explain:
3. Does the change remove, without at least an equivalent replacement of the safety function, an item relied on for safety that is listed in the ISA Summary?	☐ Yes ☒ No	If yes, explain:
4. Does the change alter any item relied on for safety, listed in the ISA Summary, that is the sole item preventing or mitigating an accident sequence of high or intermediate consequences?	☐ Yes ☒ No	If yes, explain:
5. Does the change qualify as a change specifically prohibited by NRC regulation, order or license condition?	☐ Yes ☒ No	If yes, explain:
Actions Required Prior to or Concurrent with Change Implementation Evaluation:		
Action		**Explanation**
6. Modification / Addition to CAS system or system coverage documentation	☐ Yes ☒ No	If yes, explain:
7. Acquire NRC pre-approval (license amendment)	☐ Yes ☒ No	If yes, explain:
8. Conduct/modify ISA	☐ Yes ☒ No	If yes, explain:
9. ISA Database Modification	☐ Yes ☒ No	If yes, explain:
10. Modification of other safety program information / underlying analyses (PHA, RHA, FHA, NCSA, etc.)	☐ Yes ☒ No	If yes, explain:
Actions required subsequent to Change Implementation Evaluation:		
11. Update safety program information (PHA,RHA,FHA,NCSA, P&ID)	☐ Yes ☒ No	If yes, explain:

* **If this form exists as a part of a document, the document number is not required.**

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1.0 Introduction

This Supplement to Applicant's Environmental Report (Environmental Report) is being submitted by AREVA NP Inc. (AREVA NP) as required by 10 CFR 51.60 in support of the renewal of Special Nuclear Materials License SNM-1227 for AREVA NP's Richland, Washington nuclear fuel fabrication facility. An application for renewal of that license is being submitted concurrently with this Environmental Report in accordance with the timely renewal criterion of 10 CFR 70.38. The Environmental Report content incorporates requirements in 10 CFR 51.45 and guidance in NUREG 1520 as applicable to renewal of the license for an established operating facility.

The primary objective of this report is to present summary information and data to characterize the performance of the Richland site environmental management program and to demonstrate compliance with applicable NRC license conditions and applicable environmental laws and regulations. Summary effluent and environmental monitoring data for the years 2000-2005 are provided in Section 3.0, Analysis of Environmental Effects.

2.0 Environmental Considerations

This Environmental Report is submitted in support of the continued operation of the AREVA NP Richland, Washington nuclear fuel fabrication facility. A description of the significant characteristics of the facility is provided in Chapter 1, General Information, of the license renewal application being filed concurrently with this report. That description includes a general facility description; a summary of the major site features (buildings and facilities); a general process description of how special nuclear material (SNM) is utilized; an overview of raw materials, products, and wastes; and a description of the types and amounts of SNM authorized for the site.

Chapter 1 of the license application also provides a description of the environmental setting of the Richland facility. Included in that description are discussions of site location/geography, local and regional demography and land use, regional meteorology, site/regional hydrology, and regional geology/seismology.

3.0 Analysis of Environmental Effects

AREVA NP provides effluent monitoring and environmental sampling in accordance with its current NRC special nuclear materials license (License No. SNM-1227, Chapter 5, Environmental Protection, current revision). These monitoring and sampling activities are supplemented by complementary activities conducted per the requirements of other applicable regulations, licenses, and permits. An assessment of site environmental impacts based on collected data, including summaries of the data for the years 2000-2005, are provided in Sections 3.1 and 3.2, respectively. A listing of applicable licenses and permits is provided in Section 3.3.

3.1 *Site Environmental Impacts*

As a nuclear/chemical processing and manufacturing facility, the Richland plant can potentially impact the surrounding environment via plant effluents associated with routine or abnormal conditions. For the Richland plant these effluents may be airborne, liquid, or solid wastes. In practice, these impacts are managed in accordance with applicable regulations, licenses, and permits via an integrated system of process and effluent controls, backed by effluent and environmental monitoring programs. Discussions of these impacts on pertinent environmental media follow in Sections 3.1.1 through 3.1.4 below.

3.1.1 Surface Water Quality

There are no bodies of surface water adjacent to or in the immediate vicinity of the Richland plant, the closest such body being the Columbia River located approximately 1.5 miles to the east. As such, there is negligible potential for the plant to directly impact surface water via direct releases (effluents, spills, etc.). The site however can indirectly impact surface water via its industrial wastewater discharge to the City of Richland publicly owned treatment works (POTW), which in turn discharges via a permitted outfall to the Columbia River.

Discharges of radioactive materials to the POTW (into sanitary sewerage) are regulated under 10 CFR 20.2003. This regulation limits radionuclide discharges to sewer to the monthly average concentrations listed in Table 3 of Appendix B to 10 CFR Part 20 and the total quantity of all radionuclides combined (excluding tritium and carbon-14) to one curie. The Richland effluent to sewer is continuously sampled via a composite sampler located immediately upstream of the point of discharge to the city sewer. The samples are analyzed for uranium (daily composites) and technetium-99 (Tc-99; weekly composites) for comparison to pertinent modified 10 CFR 20.2003 limits. Results of this monitoring program are provided in Table 1 and document consistent compliance with applicable radioactivity discharge limits. The measured effluent concentrations are further diluted by a factor of approximately fifty within the Richland sewer system. Tc-99, although not consequential from a dose impact, was the major contributor to the higher total curie discharge totals in CYs 2002 and 2003. Tc-99 enters the plant as a fission-related contaminant in certain feed materials to the plant containing, in part, reprocessed uranium.

As an additional check on the radiological impact of the plant's discards to sewer, sludge from the City of Richland sewage treatment plant is sampled on a monthly basis for uranium as a condition of the NRC site license. The license limit requiring investigation and follow-up action is 30 pCi U/g in a single sample or 25 pCi U/g as a six month running average. Measured levels of uranium in the sludge remain consistently well below these limits, with the single highest monthly samples for each of the CYs 2000-2005 ranging from 4.07 pCi U/g (March 2005) to 5.40 pCi U/g (May 2004).

Discharges of non-radioactive chemicals and constituents are regulated by an industrial wastewater discharge permit, which in February 2006 transitioned from the State of Washington Department of Ecology to the City of Richland. Parameters monitored on a routine basis include fluorides, nitrates, ammonia, suspended solids, pH, and flow. The samples are derived via the same composite effluent sampling station utilized for the monitoring of radioactive constituents. The effluent normally complies with limits imposed under the wastewater discharge permit. Exceedances are very infrequent and typically of very limited duration (one to a few days). All data are routinely reported to the state and city; all occurrences of non-compliance are also reported to the NRC.

Completion of processing of the legacy liquids and sludges in the site's now closed surface impoundment system, a campaign conducted over the 1996-2004 time period, has positively impacted the site's sewered liquid effluent. Levels of uranium in the effluent, albeit historically very low (see Table 1), are now typically non-detectable in the daily composite samples (<0.05 ppm or <8E-08 μCi/mℓ). Secondly, completion of the lagoon inventory processing has allowed for full realization of the fluoride reclamation/recycling benefits conveyed by the plant's Dry Conversion Facility, whereby fluorides are reclaimed as hydrofluoric acid. The current plant liquid effluent fully complies with a fluoride discharge limit in the city permit (1,000 lbs/day, monthly average) that is 60 percent lower than the limit formerly imposed under the state waste discharge permit. And lastly, elimination of legacy lagoon inventory processing has reduced the sewered effluent volume by approximately 15,000 gallons per day.

3.1.2 Groundwater Quality

Groundwater contamination in the shallow unconfined aquifer below the Richland facility is attributed to historic 1970's-era releases from the site's former surface impoundment system. By the early 1980's the impoundments were double-lined with inter-liner leachate detection/collection capability and not implicated in further environmental releases. More recently (1996-2006), the impoundment system has been removed from service under a Washington Department of Ecology (Ecology)-regulated cleanup/closure action. Under that action the impoundments were emptied of their inventory, physically dismantled, and soil was remediated (removed and disposed of) to uranium, fluoride, and nitrate soil cleanup limits derived per Ecology's Model Toxics Control Act (MTCA; WAC 173-340).

With respect to uranium, the Ecology soil cleanup limit was 12.1 mg/kg (ppm), or approximately 29 pCi/g for uranium at a U-235 enrichment of 3.5%. This limit was conservatively calculated per Ecology criteria to be protective of groundwater down to the EPA drinking water limit for uranium of 30 ppb (also the MTCA groundwater cleanup limit for uranium). In reality, for large segments of the former surface impoundment area, soil removal proceeded well beyond that required to meet the uranium cleanup limit as necessitated to meet very conservative fluoride cleanup limits (the MTCA fluoride soil cleanup level is derived to achieve a MTCA groundwater limit for fluoride that is less than 25% of the EPA primary drinking water limit for fluoride).

Removal of the surface impoundment system and remediation of associated soil contamination have eliminated the most significant potential threat to groundwater at the Richland Site. Other hazardous materials managed in forms and quantities that could impact groundwater in the event of an inadvertent release are primarily confined within closed systems within buildings, in tank systems provided with double containment, or in piping systems readily observable and/or subject to leak detection or periodic testing.

AREVA monitors the groundwater quality of its Richland site on a quarterly basis in accordance with conditions in its current NRC license and Ecology requirements. Data from the NRC-required monitoring program are provided in Tables 2 through 9; monitoring well locations are depicted in Figure 1. Groundwater flow is generally north-northeast across the site as depicted by the groundwater potentiometric contours on Figure 1; as such, Wells GM-1 and GM-2 are monitored as upgradient wells.

Levels of gross alpha and gross beta, while showing quarter-to-quarter variation, are generally stable or slightly declining; some of the wells exhibit radiological contamination levels at or near background levels. The levels are consistent with the movement and attenuation of historic contamination, with short term variations influenced by fluctuating groundwater elevation levels attributable to heavy seasonal upgradient agricultural irrigation. None of the data are considered indicative of recent or ongoing releases to groundwater. Based on the significant degree of soil remediation conducted under the Ecology-driven closure action, a long term decline in radiological groundwater contamination levels can be anticipated.

Non-radiological chemical constituents monitored include fluoride, nitrate, and ammonia; trichloroethylene (TCE), although not monitored as a part of the NRC-required program, is monitored per the Ecology-driven program. Levels of non-radiological constituents are declining consistent with attenuation of historic contamination. As depicted in Tables 2 through 9, fluoride levels are consistent with background levels (Wells GM-6, GM-7, TW-6, TW-7, and TW-21) or, if still elevated, have attenuated to levels below the EPA fluoride drinking water limit of 4 mg/ℓ (Wells GM-5 and GM-8). Levels of ammonia are generally non-detectable in all the wells except GM-5 and GM-8, where they are stable to declining. Nitrate was not subject to a groundwater cleanup limit under the Ecology MTCA cleanup action because groundwater entering the

AREVA site contains nitrates well above drinking water limits (and Ecology cleanup limits) related to upgradient agricultural operations (use of nitrate-based fertilizers). AREVA groundwater levels of nitrate generally track well with nitrate levels in upgradient Well GM-2, a second and more westerly upgradient monitoring well utilized (in conjunction with Well GM-1) in the Ecology-regulated monitoring program. Levels of TCE, like fluoride, have declined to levels below the EPA drinking water limit and Ecology groundwater cleanup limit, in this case 5 ppb. Like the radiological constituents, groundwater contamination levels of the non-radiological constituents of concern are anticipated to decline further in the long term based on the significant soil remediation accomplished under the Ecology cleanup action.

It should be noted that groundwater is not utilized for any applications, potable or non-potable, on the AREVA site or on the immediately downgradient portions of the U.S. Department of Energy (USDOE) Hanford Nuclear Reservation. The USDOE, via its contractor Battelle, monitors groundwater immediately downgradient of the AREVA site for uranium and TCE. Based on the latest available data (2005), levels of both constituents in the groundwater are lower than their respective EPA drinking water limits.

3.1.3 Air Quality

The potential for operations at the Richland site to impact the surrounding environs with respect to radiological air quality is primarily limited to point sources, i.e., its radioactive process emissions stacks. Lack of handling of unencapsulated or non-containerized licensed materials in unventilated or outdoor environments has precluded fugitive emissions from being a viable source of adverse environmental impacts. (Special control and monitoring provisions associated with the recently completed surface impoundment remediation project are discussed later.) The Richland site's radioactive process stacks are high efficiency particulate absolute (HEPA)-filtered and continuously sampled for radioactive emissions as a condition of its NRC license, as well as in conjunction with the site's State of Washington Radioactive Air Emissions License.

Results of the Richland radioactive stack emissions testing are reported to the NRC on a biannual basis as required by 10 CFR 70.59; the data are summarized in Table 10. The data reveal very low emissions. The highest six month's uranium-based emissions total (all stacks combined) for the CY 2000-2005 period was 4.71 μCi alpha radiation (first half 2003). These data form the basis for demonstration of consistent compliance with the modified airborne radioactivity limits in 10 CFR 20 Appendix B, Table 2.

Dose impact to a member of the public is limited by the constraint limit in 10 CFR 20.1101(d) to 10 mrem per year. Calculated doses to the theoretical MEI from Richland site radioactive stack emissions (ignoring radon) for CYs 2000-2005 ranged from 1.64E-04 to 1.2E-02 mrem/yr, indicating negligible impacts from radioactive point source emissions.

The solids removal and soils remediation phases of the Richland site's surface impoundment closure project, conducted over July 2004 through September 2006, provided a potential for release of airborne radioactive contamination via fugitive emissions. Removal activities were accompanied by dust control measures and worker exposure monitoring. As agreed upon with the Washington Department of Health, the entire inventory removal and environmental remediation phases of the lagoon closure project (2002-2006) were accompanied by continuous fenceline ambient air monitoring for radioactivity at locations selected by the state. Annual dose impacts to the theoretical MEI calculated from this monitoring data were also low, ranging from 2.8E-01 to 4.5E-01 mrem/yr. over the reported period (2002-2005).

Non-radiological chemical quality of the site's gaseous effluents as well as of the surrounding environs is regulated by the state, in conjunction with the local air pollution control authority.

With the exception of oxides of nitrogen (NO_x) emissions related to the plant's utilization of nitric acid in its powder and pellet dissolvers, the Richland facility has limited potential for significant non-radiological chemical airborne effluents. NO_x emissions are limited via a Synthetic Minor Order administered by the local Benton Clean Air Authority (BCAA). The Order imposes limits on the annual throughputs of uranium through the dissolvers as well as on the amount of NO_x emitted per quantity of uranium oxide dissolved. Emissions are measured via required stack emissions tests, results of which are reported to the BCAA. The plant has consistently complied with all aspects of the synthetic minor order since its inception in 1995.

Although not required by state or local regulation, fluoride emissions are measured on stacks ventilating processes containing, or potentially containing, fluorides, most notably the K-62 stack servicing the Dry Conversion Facility (DCF). The DCF is the site of all the plant's gaseous UF_6 to UO_2 conversion operations. The offgas sampling for fluorides on affected stacks is conducted in parallel with the radionuclide stack sampling; samples are collected and analyzed weekly. Fluoride emissions are low, with annual combined site totals ranging from 5.7 to 19.4 kgs for CYs 2000-2005.

The State of Washington regulates fluorides in the environs by means of two standards - an ambient air standard and a standard for fluoride in vegetation (forage). Monitoring to assess compliance with these limits is a condition of the site's current NRC license. Data from these monitoring activities for CY's 2000-2005 are provided in Table 11 and indicate consistent compliance with state environmental limits. Sampling locations are depicted in Figure 2.

3.1.4 Terrestrial Quality

The Richland site, by virtue of its process controls, bulk chemical storage practices, and effluent controls, poses a low threat to the terrestrial environment. The most significant threat to the terrestrial environment within the site restricted area has traditionally been the surface impoundment system. Over the period of 1996-September 2006, this system has been emptied of its inventory and dismantled, followed by remediation of soil contamination. The AREVA-owned land area outside the fenced exclusion area remains essentially unchanged and undeveloped. The quarter section of AREVA land west of the plant continues to be leased for agricultural purposes. Environmental monitoring activities provide no indication of deposition of plant contamination in the immediately surrounding environs. This includes monitoring for uranium in soil and, as previously discussed, fluorides in forage. Results of both of these monitoring activities are provided in Table 11. Sampling station locations are depicted in Figure 2.

3.1.5 Summary of Environmental Impacts

As discussed in Sections 3.1.1 through 3.1.4, the Richland site is managing its operations within applicable regulatory and license-imposed effluent limits and environmental standards. Furthermore, the removal of the surface impoundment system and remediation of associated soil contamination has significantly reduced the plant's potential impacts to surface water, groundwater, and the terrestrial environment. Continuation of the plant's integrated system of process and effluent controls, backed by effluent and environmental monitoring, will provide continued assurance of acceptable environmental impacts going forward.

3.2 *Summary of Environmental Data, CY 2000-2005*

Tables 1 through 11 provide summary effluent and environmental monitoring data collected in fulfillment of conditions in AREVA's current NRC license for the Richland site (License No. SNM-1227, Chapter 5, Environmental Protection).

3.3 *Environmental Licenses and Permits*

As an operating facility, the Richland site has acquired the environmental licenses and permits necessary to conduct its activities. The key licenses and permits, as issued by federal, state, and local regulatory agencies, are listed in Table 12.

Table 1 Radioactive Discharges to Sewer

Year	Annual Avg. U Concen-tration, µCi/mℓ	Highest Monthly Avg. U Concen-tration, µCi/mℓ	Annual Avg. Tc-99 Concen-tration, µCi/mℓ	Highest Monthly Avg. Tc-99 Concen-tration, µCi/mℓ	Total Annual Radioactive Discharge, Ci
2000	<7.90 E-08	<8.20 E-08			<0.16
2001	<1.00 E-07	<1.23 E-07	2.40 E-06	1.08 E-05	<0.27
2002	<1.57 E-07	<2.7 E-07	6.49 E-06	1.92 E-05	<0.73
2003	<1.58 E-07	<2.88 E-07	2.05 E-06	3.92 E-06	<0.48
2004	<1.97 E-07	<4.24 E-07	7.22 E-07	1.27 E-06	<0.14
2005	<1.08 E-07	<1.24 E-07	1.14 E-06	1.69 E-06	<0.14
Limit*		4 E-06		6 E-04	1.0

* 10 CFR 20.2003/10 CFR 20 Appendix B, Table 3 (modified for ICRP 66/68).

Table 2 Data for Test Well GM-1

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	10	9	0.33	19.2	0.06U	7.7
00-2	5	16	0.25	18.8	0.06U	7.8
00-3	4	16	0.19	21.1	0.06U	7.8
00-4	4	15	0.24	21.6	0.06U	7.8
01-1	6	11	0.26	22.1	0.06U	7.8
01-2	6	10	0.25	20.9	0.06U	7.8
01-3	5	12	0.27	22.7	0.06U	7.8
01-4	2	10	0.27	24.	0.06U	7.8
02-1	4	9	0.19	22.6	0.06U	8.0
02-2	8	17	0.18	23.3	0.06U	7.5
02-3	5	14	0.21	24.9	0.06U	7.3
02-4	4	2	0.29	24.6	0.06U	7.6
03-1	6	14	0.25	25.1	0.06U	7.4
03-2	9	11	0.16	27.6	0.06U	8.2
03-3	7	17	0.15U	24.2	0.06U	7.3
03-4	13	15	0.31	25.1	0.06U	8.5
04-1	13	17	0.27	23.0	0.06U	8.2
04-2	13	17	0.17	23.0	0.06U	8.6
04-3	21	18	0.18	24.0	0.06U	9.2
04-4	16	12	0.18	21.6	0.06U	8.4
05-1	14	22	0.68	22.3	0.06U	8.6
05-2	12	21	0.17	16.9	0.06U	9.7
05-3	17	19	0.36	19.0	0.06U	8.9
05-4	8	15	0.36	17.9	0.06U	8.6

U - Not detected above the given value

Table 3 Data for Test Well GM-5

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	39	18	4.0	30.6	13	7.6
00-2	16	24	3.7	39	12	7.4
00-3	12	21	3.8	44	13	7.3
00-4	14	22	4.3	38.8	14.3	7.6
01-1	43	19	3.4	45.0	14.3	7.4
01-2	27	12	3.4	51.6	11.0	7.4
01-3	24	16	3.2	45.8	11.2	7.5
01-4	28	17	4.0	48.2	11	7.6
02-1	26	12	3.0	49.7	10.2	7.5
02-2	43	12	3.2	49.7	10.1	7.1
02-3	27	19	3.1	53.1	9.6	
02-4	42	17	3.4	51.3	9.7	
03-1	31	17	3.2	50.2	3.6	7.6
03-2	51	12	2.8	52.2	8.7	7.8
03-3	46	19	3.0	49.5	8.9	7.8
03-4	51	21	3.3	53.3	7.9	7.8
04-1	55	16	3.3	58.1	7.2	7.8
04-2	44	15	3.2	55.1	6.1	7.8
04-3	34	14	3.2	54.9	7.8	8.0
04-4	30	14	2.7	53.5	8.9	7.6
05-1	49	13	2.6	61.4	7.5	7.7
05-2	32	22	2.8	63.0	8.1	7.8
05-3	36	21	2.9	64.6	8.8	7.6
05-4	44	24	2.8	55.8	6.9	7.6

U - Not detected above the given value

Table 4 Data for Test Well GM-6

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	8	29	0.29	22.3	0.06U	7.6
00-2	5	22	0.28	22.9	0.06U	7.4
00-3	8	27	0.30	28.6	0.06U	7.4
00-4	7	31	0.28	26.9	0.06U	7.8
01-1	12	24	0.37	31.8	0.06U	7.6
01-2	10	18	0.39	37.9	0.06U	7.4
01-3	14	17	0.36	36.5	0.06U	7.5
01-4	13	23	0.35	38.9	0.06U	7.6
02-1	14	17	0.25	41.8	0.06U	7.5
02-2	12	16	0.23	40.0	0.06U	7.1
02-3	10	21	0.23	36.6	0.06U	7.0
02-4	12	22	0.22	33.9	0.06U	6.7
03-1	20	26	0.22	31.2	0.06U	7.6
03-2	12	22	0.19	34.1	0.06U	7.8
03-3	21	30	0.24	30.0	0.06U	8.0
03-4	34	34	0.20	30.7	0.06U	7.8
04-1	14	20	0.27	33.0	0.06U	8.0
04-2	19	28	0.25	36.8	0.06U	7.9
04-3	6	22	0.26	42.5	0.06U	8.0
04-4	22	32	0.17	58.3	0.06U	7.7
05-1	18	46	0.24	53.8	0.06U	7.7
05-2	20	24	0.27	44.7	0.06U	7.8
05-3	12	21	0.31	39.3	0.06U	8.2
05-4	9	24	0.22	30.0	0.06U	7.9

U - Not detected above the given value

Table 5 Data for Test Well GM-7

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	20	31	0.27	27.6	0.06U	7.4
00-2	10	28	0.33	30.6	0.06U	7.5
00-3	5.9	27	0.33	38.5	0.06U	7.5
00-4	12	30	0.35	37.3	0.06U	7.8
01-1	21	22	0.40	43.1	0.06U	7.5
01-2	18.1	20.1	0.41	43.4	0.06U	7.7
01-3	20.9	20.8	0.43	44.7	0.06U	7.6
01-4	20.4	23.2	0.40	50.0	0.06U	7.6
02-1	13	15	0.22	43.8	0.06U	7.8
02-2	19	25	0.23	44.1	0.06U	7.4
02-3	14	21	0.25	49.9	0.06U	6.6
02-4	9	14	0.29	44.1	0.06U	7.3
03-1	6	17	0.26	38.4	0.06U	7.6
03-2	13	16	0.24	45.9	0.06U	7.6
03-3	20	21	0.32	44.7	0.06U	7.7
03-4	12	22	0.25	40.9	0.06U	7.7
04-1	12	20	0.32	45.9	0.06U	7.8
04-2	11	21	0.30	48.3	0.06U	7.7
04-3	13	21	0.28	53.1	0.06U	7.8
04-4	21	34	0.17	62.1	0.06U	7.6
05-1	15	39	0.28	78.4	0.06U	7.4
05-2	14	35	0.29	68.0	0.06U	7.7
05-3	13	30	0.47	61.2	0.06U	7.7
05-4	5	17	0.55	45.2	0.06U	7.9

U - Not detected above the given value

Table 6 Data for Test Well GM-8

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	96	48	4.9	33.9	10.0	7.4
00-2	48	55	4.4	43.5	10.3	7.3
00-3	47	46	4.7	41.7	10.6	7.1
00-4	52	68	5.1	39.6	12.9	7.4
01-1	109	56	4.9	46.6	14.1	7.4
01-2	97	27	4.4	50.6	11.6	7.4
01-3	100	31	5.0	47.8	11.2	7.4
01-4	93	41	4.7	50.2	12.7	7.3
02-1	78	32	4.0	54.7	11.7	7.2
02-2	100	39	3.7	60.1	11.4	7.0
02-3	116	42	4.0	60.1	10.9	
02-4	71	40	4.0	59.4	11.5	7.8
03-1	67	39	3.6	58.7	11.1	7.5
03-2	97	31	3.5	59.2	11.4	7.7
03-3	113	45	3.6	60.1	11.2	7.7
03-4	91	44	3.3	55.4	10.3	7.6
04-1	119	34	3.5	62.0	10.2	7.6
04-2	97	36	3.6	60.5	10.5	7.8
04-3	83	29	3.9	57.8	11.0	7.8
04-4	84	37	3.8	56.0	12.1	7.5
05-1	67	45	3.4	65.5	14.1	7.4
05-2	82	56	3.3	68.5	11.4	7.6
05-3	71	60	3.3	71.4	12.1	7.5
05-4	51	46	3.0	61.7	11.1	7.5

U - Not detected above the given value

Table 7 Data for Test Well TW-6

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	13	49	0.37	30.9	0.06U	7.1
00-2	5	22	0.52	37.2	0.06U	7.1
00-3	4	15	0.56	8.35	0.14	7.4
00-4	4	29	0.36	7.14	0.11	7.3
01-1	19	71	0.82	57	0.06U	7.4
01-2	16	25	0.77	62	0.13	7.4
01-3	7	12	0.85	27	0.11	7.5
01-4	8	17	0.40	20	0.11	7.7
02-1	14	24	0.46	72	0.06U	7.6
02-2	10	18	0.23	49	0.06U	7.8
02-3	6	13	0.39	31	0.06U	7.7
02-4	5	19	0.33	33	0.06U	7.7
03-1	7	39	0.34	69	0.06U	7.7
03-2	9	11	0.32	47	0.79	7.4
03-3	2	9	0.22	76	0.35	7.4
03-4	7	38	0.28	42	0.06U	7.4
04-1	11	16	0.28	47	0.80	7.4
04-2	14	14	0.30	52	<0.06U	7.4
04-3						
04-4	21	25	0.27	68	0.12	7.4
05-1	12	15	0.31	56	0.09	7.2
05-2	6	12	0.29	52	0.06U	7.4
05-3	4	9	0.22	13	0.38	7.3
05-4	9	18	0.27	36	0.06U	7.4

U - Not detected above the given value

Table 8 Data for Test Well TW-7

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	2	12	0.53	42.5	0.06U	7.7
00-2	5	10	0.38	33.6	0.06U	7.7
00-3	3	9	0.71	18.8	0.06U	7.6
00-4	3	16	0.20	19.8	0.06U	7.7
01-1	6	12	0.45	44.4	0.06U	7.7
01-2	6	10	0.52	43.6	0.06U	7.7
01-3	9	8	0.35	33.5	0.14	7.7
01-4	7	13	0.60	22.8	0.10	7.8
02-1	6	10	0.22	45	0.06U	7.8
02-2	9	13	0.22	45	0.06U	7.8
02-3	4	10	0.25	27	0.06U	7.7
02-4	2	11	0.38	28	0.06U	7.8
03-1	5	15	0.24	52	0.06U	7.8
03-2	5	8	0.21	40	0.06U	7.8
03-3	6	9	0.28	34	0.06U	7.7
03-4	5	15	0.29	34	0.06U	7.7
04-1	6	16	0.20	40	0.06U	7.8
04-2	4	10	0.28	43	0.06U	7.7
04-3	5	13	0.28	42	0.09	7.4
04-4	10	21	0.34	46	0.06U	7.8
05-1	6	11	0.25	51	0.06U	7.7
05-2	7	14	0.21	46	0.06U	7.8
05-3	6	11	0.31	32	0.06U	7.7
05-4	5	16	0.26	29	0.06U	7.8

U - Not detected above the given value

Table 9 Data for Test Well TW-21

Yr/Qtr	Alpha pCi/ℓ	Beta pCi/ℓ	F mg/l	NO_3 as N mg/l	NH_3 as N mg/l	pH
00-1	7	10	0.27	23.8	0.06U	7.6
00-2	5	10	0.31	33.0	0.06U	7.7
00-3	4	12	0.34	36.3	0.06U	7.7
00-4	4	16	0.34	34.1	0.06U	7.8
01-1	9	12	0.41	40	0.06U	7.8
01-2	6	10	0.43	42	0.06U	7.7
01-3	8	8	0.46	42	0.06U	7.9
01-4	5	8	0.40	18	0.06U	7.7
02-1	8	13	0.24	42	0.06U	7.7
02-2	8	12	0.29	43	0.06U	7.8
02-3	6	10	0.25	33	0.06U	7.7
02-4	3	10	0.26	29	0.06U	7.7
03-1	6	11	0.28	24	0.06U	7.7
03-2	7	9	0.41	31	0.06U	7.7
03-3	6	10	0.22	29	0.06U	7.6
03-4	6	11	0.22	27	0.06U	7.7
04-1	6	13	0.20	34	0.06U	7.8
04-2	10	8	0.22	29	0.06U	7.7
04-3	8	10	0.25	38	0.06U	7.4
04-4	11	17	0.16	45	0.06U	7.8
05-1	5	12	0.23	44	0.06U	7.7
05-2	6	10	0.23	40	0.06U	7.7
05-3	4	10	0.22	35	0.06U	7.8
05-4	8	9	0.26	21	0.06U	7.9

U - Not detected above the given value

Table 10 Stack Radioactive Discharges

Year (total)	U, µCi α
2000	4.44
2001	7.28
2002	3.81
2003	6.71
2004	2.75
2005	6.15

Table 11 Environmental Sampling Data

Sample Location	Station No. 1	Station No. 2	Station No. 3	Station No. 4	Station No. 5	Station No. 6
Type of Sample	Soil (quarterly grab)	Soil (quarterly grab)	Air (monthly integrated)	Air (monthly integrated)	Forage (monthly[1] grab)	Forage (monthly[1] grab)
Data Period	Qtr (grab)	Qtr (Grab)	Qtr Avg	Qtr Avg	Qtr Avg	Qtr Avg
Yr/Qtr	U pCi/g	U pCi/g	F $\mu g/m^3$	F $\mu g/m^3$	F-ppm	F-ppm
00-1	1.0	0.7	0.07	0.05		
00-2	1.27	1.08	0.11	0.06	2.9	3.4
00-3	1.15	1.63	0.09	0.06	3.6	3.0
00-4	0.68	0.73	0.07	0.04	5.8	9.0
01-1	0.7	0.83	0.03	0.04		
01-2	0.92	0.81	0.03	0.04	2.0	4.9
01-3	1.24	0.77	0.05	0.04	2.1	4.8
01-4	1.12	0.66	0.04	0.03	6.6	21.0
02-1	0.85	0.52	0.04	0.05		
02-2	0.66	0.79	0.04	0.02	15.3	10.7
02-3	1.13	0.74	0.06	0.03	8.0	4.8
02-4	0.90	0.75	0.03	0.03	12	4.8
03-1	0.42	1.01	0.26	0.04		
03-2	1.10	0.79	0.07	0.04	4.0	5.3
03-3	0.6	0.5	0.09	0.04	5.8	11.9
03-4	0.74	0.61	0.04	0.02	15	23
04-1	0.42	1.01	0.04	0.03		
04-2	1.63	1.48	0.31	0.07	11.6	38.5
04-3	3.75	1.90	0.23	0.45	6.6	7.6
04-4	0.74	0.61	0.39	0.24	7.2	7.5
05-1	0.42	1.01	0.19	0.12		
05-2	0.79	0.58	0.33	0.36	16	19.4
05-3	2.05	1.48	0.44	0.37	6.7	6.3
05-4	0.87	0.93	0.39	0.21	29	16
Limit	NA[2]		0.5[3]		40[4]	

[1] During growing season only (April – October).
[2] No applicable NRC limit.
[3] WAC 173-481-110. Average for entire growing season.
[4] WAC 173-481-100. Average for entire growing season.

Table 12 Environmental Licenses and Permits

License/ Permit	Issuer	Description
NRC Site Operating License (No. SNM1227)	U.S. Nuclear Regulatory Commission	This major license from the U.S. Nuclear Regulatory Commission is the primary license under which AREVA NP Inc. (AREVA NP) operates its fuel fabrication facility. The license establishes the allowable quantities of special nuclear material (enriched uranium) that AREVA NP is authorized to acquire, possess, and process and establishes the safety and environmental requirements (license conditions) under which the licensed activities are performed.
State of Washington Radioactive Materials License (No. WN-I062-1)	WA State Department of Health	This license authorizes AREVA NP to possess specific radioactive materials, primarily source material (natural and depleted uranium) and sealed sources. For each material the license authorizes specific uses and also imposes conditions related to monitoring and accountability.
Washington State Radionuclide Air Emissions License (License No. AIR 02-907)	WA State Department of Health	This license describes, authorizes, and places operating conditions and limitations on each of AREVA NP's radioactive process offgas stacks.
Richland Industrial Wastewater Discharge Permit CR-IU008	City of Richland	This industrial wastewater discharge permit authorizes the discharge of wastewater from AREVA NP plant processes to the City of Richland sewer system. The permit sets effluent limits for a list of chemical constituents and total discharge volume and establishes the monitoring and reporting requirements to assure compliance.
Dangerous Waste Part A Permit	WA State Department of Ecology	This permit provides AREVA NP with "interim status" operating authority with respect to its dangerous waste treatment, storage, or disposal (TSD) operations.

License/ Permit	Issuer	Description
Generator Site Use Permit: Commercial Low-Level Radioactive Waste Disposal Site, Richland, WA (Permit No. G-1032)	WA State Department of Ecology	This use permit authorizes AREVA NP to dispose of specified wastes from its fuel fabrication facilities at the State of Washington Hanford commercial low-level radioactive waste disposal site.
Incinerator Operating Permit	Benton Clean Air Authority	This permit provides local air pollution control authority authorization for AREVA NP to operate its combustible waste incinerator.
Oxides of Nitrogen Synthetic Minor Order (Order 95-05)	Benton Clean Air Authority	This order authorizes oxides of nitrogen (NO_X) airborne emissions in annual amounts less than 100 tons without the need for a Title 5 Air Operating Permit. The Order limits annual throughput in AREVA NP's pellet and powder dissolvers, limits feedrate to the SWUR incinerator, and imposes emissions testing and reporting requirements.
Hazardous Materials Certificate of Registration (Reg. No. 060706 551 0430)	U.S. Department of Transportation	This DOT registration authorizes AREVA NP's activities related to the shipping and receipt of specified quantities of hazardous materials/wastes.
Generator Site Access Permit (0110 000 024)	Utah Radiation Control Board	This permit allows AREVA NP to ship radioactive wastes to radioactive waste disposal facilities in Utah, e.g., Energy Solutions.

Figure 1 Monitoring Wells and Groundwater Flow Contours

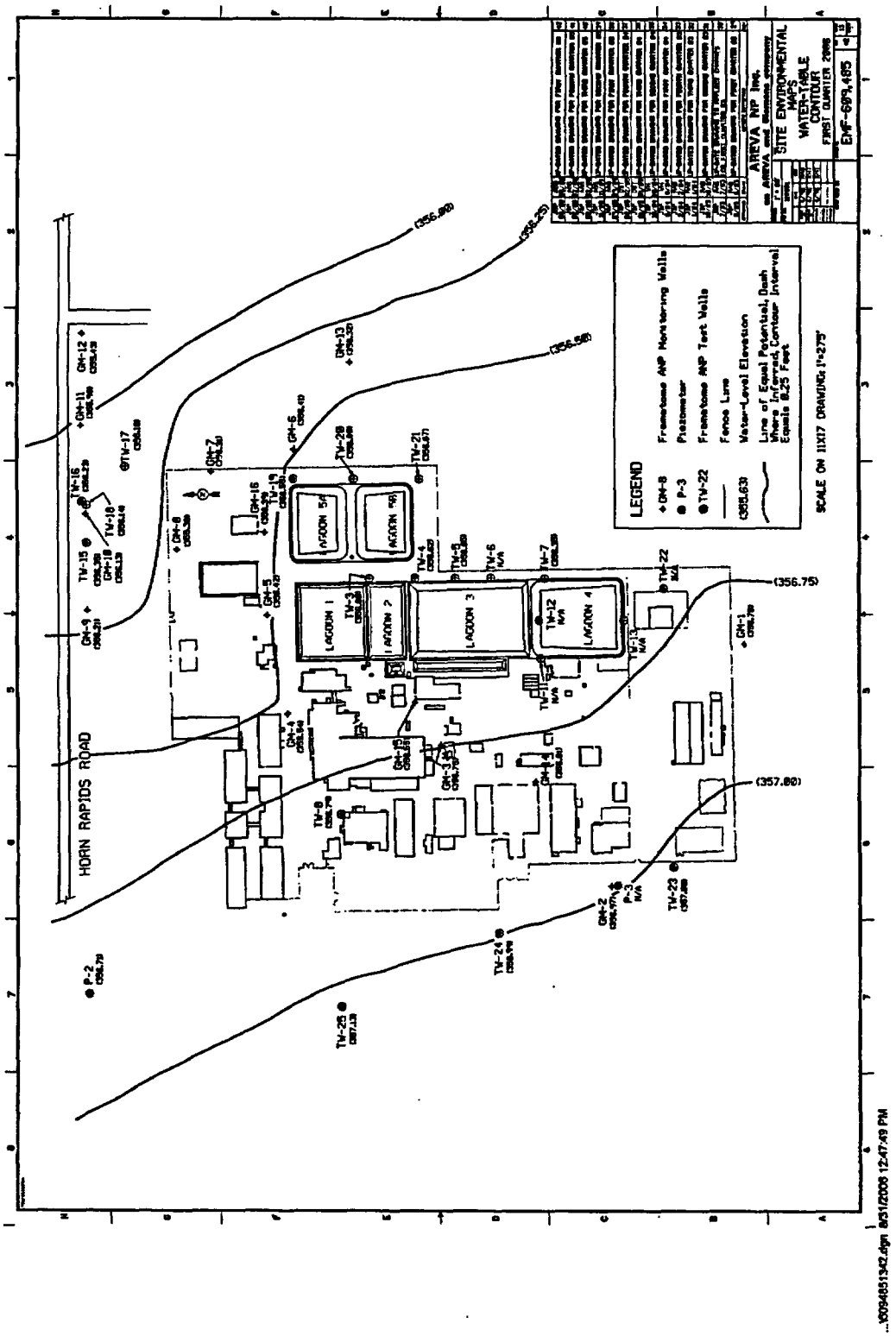
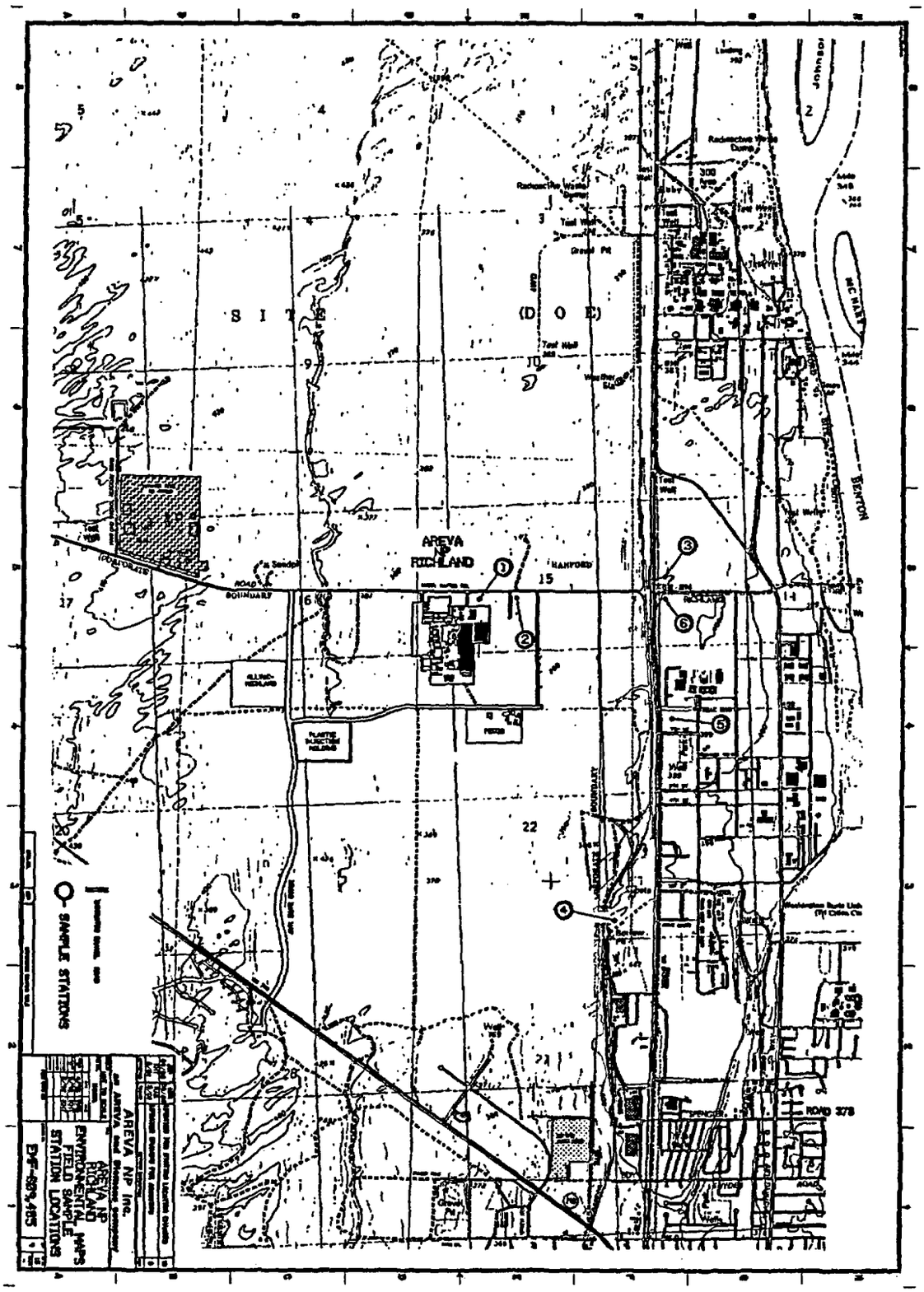
Figure 2 Environmental Sampling Stations