AECL EACL

Follow-Up Program

Environmental Assessment Follow-Up Program for Whiteshell Laboratories

03704-001
Revision 1

2002 June Juin 2002

Whiteshell Laboratories
Pinawa Manitoba
Canada R0E 1L0

Whiteshell Laboratories
Pinawa Manitoba
Canada R0E 1L0

AECL EACL

Follow-Up Program

Environmental Assessment Follow-Up Program for Whiteshell Laboratories

03704-001
Revision 1

Prepared by
Rédigé par

R.A. Helbrecht
WL Decommissioning Program Manager

Reviewed by
Vérifié par

N.M. Soonawala
Licensing & Radiation Protection - WL

Approved by
Approuvé par

C.W. Zarecki
WL Site Head

2002 June Juin 2002

Whiteshell Laboratories
Pinawa Manitoba
Canada R0E 1L0

Whiteshell Laboratories
Pinawa Manitoba
Canada R0E 1L0

AECL EACL

Release and Revision History / Liste des documents et des révisions

0939B Rev. 13

Document Details / Détails sur le document

Title / Titre	Total no. of pages / Nbre total de pages
Environmental Assessment Follow-Up Program for Whiteshell Laboratories	

Release and Revision History / Liste des documents et des révisions

Release Document No./N°	Release Document Date	Revision Révision No./N°	Revision Révision Date	Purpose of Release; Details of Rev./Amendement Objet du document; détails des rév. ou des modif.	Prepared by Rédigé par	Reviewed by Examiné par	Approved by Approuvé par
1		0	2002 May	Document released for review.	R.A. Helbrecht		
2		1	2002 June	Revised to incorporate CNSC & DFO comments	R.A. Helbrecht		

DCS/RMS Input / Données SCD ou SGD

Rel. Proj. Proj. conn.	Project Projet	SI	Section	Serial Série	Sheet Feuille No. N°	Of De	Unit No.(s) Tranche n°
					1	1	

TABLE OF CONTENTS

TABLES

FIGURES

1. INTRODUCTION

On 2002 April 02, the Environment Minister announced his decision on the environmental assessment (EA) of the proposed Whiteshell Laboratories Decommissioning Project. The Minister determined that the project was not likely to cause significant environmental effects and referred the project back to the Responsible Authorities, the Canadian Nuclear Safety Commission (CNSC) and the Department of Fisheries and Oceans Canada (DFO) for appropriate action.

The environmental assessment was conducted in accordance with the Canadian Environmental Assessment Act. As part of the environmental assessment process the CNSC identified the need for a follow-up program. Accordingly, the Comprehensive Study Report submitted to the CNSC and ultimately to the Canadian Environmental Assessment Agency included a description of the planned follow-up program. In his decision, the Minister also recommended that the mitigation measures and commitment to enhanced monitoring be implemented.

While site baseline data is available with respect to most of the planned decommissioning activities, additional information gathering will be required to confirm the EA findings and the performance of mitigation measures, and to support the end-state proposed for some project components (e.g., Waste Management Area low-level trenches, landfill, sewage lagoons). Additional monitoring is also required to identify remedial work required to meet the waste disposal timing assumptions (e.g., facility fitness for service).

The purpose of this report is to document the implementation plan for the key follow-up activities and to identify the implementation schedule proposed to meet the follow-up monitoring commitments as specified in the Comprehensive Study Report [1].

1.1 Goals and Objectives

Follow-up programs developed under the Canadian Environmental Assessment Act are designed and implemented to achieve the following key goals:

- verify the accuracy of the environmental assessment, and,
- determine the effectiveness of any mitigation measures that have been implemented.

As stated in Section 9.1 of the Comprehensive Study Report, the objectives of the follow-up activities for the WL Decommissioning project are to:

- optimize the monitoring and surveillance program already in place at WL,
- confirm that appropriate mitigation measures are implemented,
- develop appropriate responses to unforeseen events, and,
- identify effects of the project that may not have been predicted.

To achieve those objectives, a number of activities will be implemented, including monitoring, surveillance and inspection, all of which require planning, data collection, analysis, evaluation and reporting.

Goals specific to the individual components of the follow-up monitoring program are detailed in the following section.

2. FRAMEWORK AND GOALS FOR THE FOLLOW-UP PROGRAM

The framework and specific goals for the follow-up program and associated monitoring are discussed under three separate headings, namely:

- environmental components,
- interim storage and final endstate support,
- public communications.

Goals specific to each follow-up area are also documented.

2.1 Follow-up for Environmental Components

Environmental monitoring during the decommissioning period will continue in accordance with AECL's Environmental Protection Program [2]. Table 1 presents a summary of the existing, routine environmental monitoring activities. Figure 1 shows the Whiteshell monitoring stations and Figure 2 gives surface water sampling locations around the Waste Management Area.

Table 1: Summary of Environmental Monitoring Activities at the Whiteshell Laboratories

Environmental Component	Sampling Location	Parameters	Sampling Frequency
Air	Whiteshell Laboratories perimeter and off-site	γ (TLDs)	Continuous
Air Effluents	WL and WMA Facilities	Gross α/β, γ-spec	Continuous
Surface Water	Winnipeg River WMA Ditch	^{90}Sr,Gross α/β, γ-spec.,	D-W M
Groundwater	WMA FIG, Misc. (Cs ponds, landfill, B200)	Gross α/β " "	S/A A/R A/R
Liquid Effluents	LWTC tanks,OFS, Lagoon	Gross α/β, γ-spec., ^{90}Sr, non-radiological	Continuous
Sediments	Winnipeg River	Gross α/β, ^{137}Cs	A
Fish	Winnipeg River	Gross α/β, ^{137}Cs, ^{40}K	A
Vegetation	Whiteshell Laboratories perimeter, WMA	Gross α/β, ^{137}Cs, ^{90}Sr	S
Land Surveys	On-site, off-site	γ-spec	A

D: Daily M: Monthly S/A: Semi-annually
W: Weekly A: Annually A/R: As required

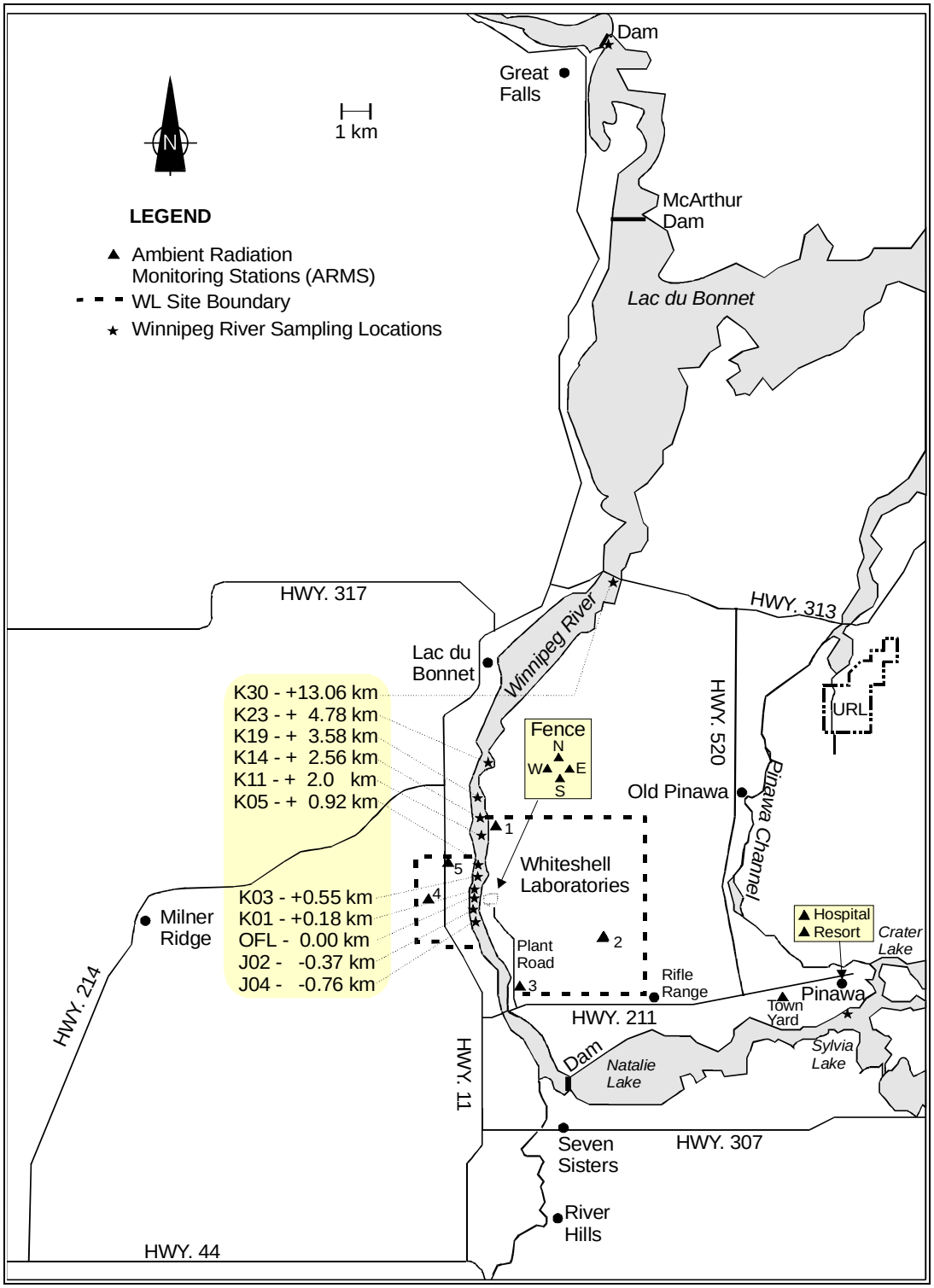


Figure 1: Whiteshell Laboratories and Surrounding Area Monitoring Stations

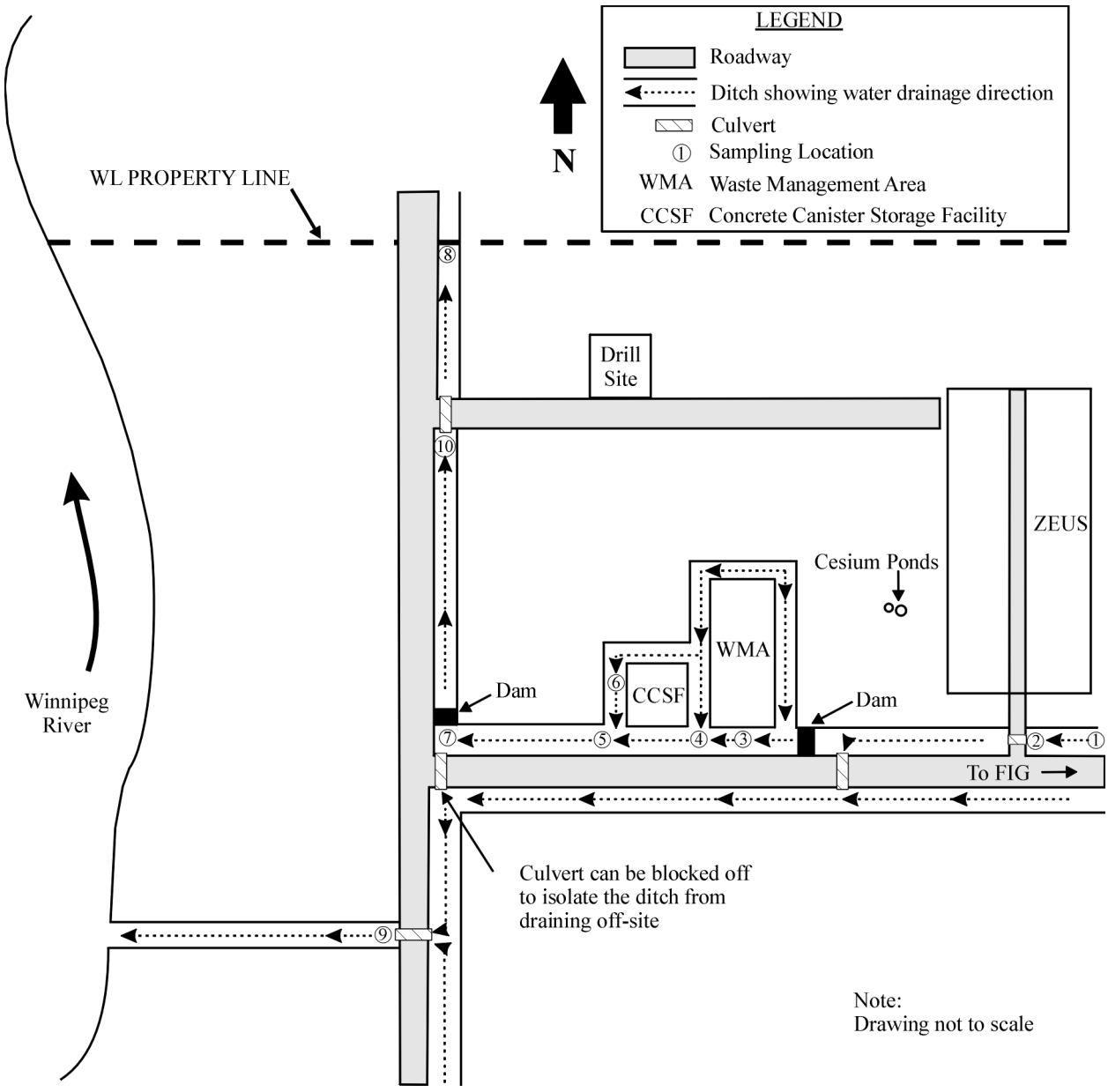


Figure 2: WMA Surface Water Run-Off Sampling Locations

Monitoring and/or resurveying is built into each of the three phases of decommissioning. For monitoring requirements arising from decommissioning but not covered in the AECL Environmental Protection Program, appropriate procedures will be developed that will meet or exceed federal and provincial regulatory requirements.

Monitoring requirements will change in terms of frequency, duration and type over the course of decommissioning and following the completion of decommissioning. These changes will reflect not only changes in regulatory requirements and technological advancements but also the characteristics of the effects being monitored. Air quality monitoring, for example, will have only relatively short-term monitoring requirements because air quality generally is only affected during construction/ demolition related activities. In addition, the type of air quality monitoring will depend on the specific activity being undertaken; remediating contaminated interior spaces requires a different type and scale of air quality monitoring than that required during demolition.

The frequency and type of monitoring will continue to be evaluated over time. Monitoring will be adjusted to reflect findings from the monitoring activities. Cessation of a monitoring activity will occur once it can be shown that an effect has stabilized or has been reduced to a level where it is no longer considered significant by regulatory requirements or community concerns. Any proposals on modifications to the monitoring program will be communicated to the CNSC.

Although no significant project effects were identified, the routine monitoring activity will be maintained to confirm that project impacts remain as predicted and to identify significant effects which were not predicted. The basis for follow-up monitoring is the significance analysis for environmental components outlined in Table 2. Follow-up activities will be conducted over the three phases of decommissioning and an institutional control period following completion of the project, as follows:

- Phase 1 ~ 5 years
- Phase 2 ~ 10 years
- Phase 3 ~ 45 years
- Institutional Control Period – 200 years

Identification of the continuing schedule relative to project phases is also indicated in Table 2.

2.1.1 Goals for Verification of EA Findings/Performance of Mitigation Measures

Follow-up is to confirm the results of the environmental assessment and to assess the performance of planned mitigation measures. One area where some baseline work will be necessary during decommissioning is for air quality parameters affected by decommissioning activities. This baseline work is additional to the work already conducted in support of the environmental assessment. Nuisance dust and fine particulates are the principal air quality considerations; however, in order to properly interpret the data, meteorological data will also be needed.

Goals specific to air and meteorology are:

- establish a baseline for air quality parameters of concern on a seasonal basis,
- evaluate the effects of demolition activities on air quality,
- maintain the acquisition of pertinent meteorological data, and
- review the monitoring requirements as a function of the monitoring data collected in the previous year and/or after each decommissioning or demolition cycle.

Table 2: Elements of the Follow-up Program

Component	Description of Residual Effect	Monitoring vs Project Schedule				Comment/Conclusion
		Phases			Post Project	
		1	2	3		
	Release of airborne radioactive particulates during disconnecting of services, decontamination retrieval and repackaging of materials and remediation	√	√	√		***Not significant:*** *Radioactive emissions are regulated and controlled in accordance with derived release limits. The target for total emissions is a small percentage of the DRL. HEPA filters effectively control radioactive dust and where greater filtration is required, more filters can be added. The result is that the release of radioactive emissions is negligible.*
	Release of airborne radioactive particulates during break-up of concrete canisters			√		
	Nuisance Dust and fine particulates from building demolition, and site restoration and rehabilitation	√		√		***Not significant:*** *A number of factors will limit the transport of nuisance dust to the licensed property area.*
	Production of methane gases from Landfill			√		***Not significant:*** *Effect is easily mitigated as venting is widely used technology for controlling methane gas build-up.*
	Noise during demolition and site restoration	√		√		***Not significant:*** *The preservation of the dense tree cover across the site will provide a natural noise barrier between site activities and potential noise receptors within the Project Study Area. Vibration effects would likely only be of concern within the Project Study Area to adjacent buildings and structures.*
Surface Water Quality (hydrology)	Surface water contamination associated with migration of decontamination process water, the remediation of affected lands and buried services	√		√		***Not significant:*** *Decontamination process water will be sent to the ALWTC for treatment. Decontamination is normally done indoors and there is no opportunity for water to go anywhere except to the ALWTC drains.*
	Discharge of treated water flows into Winnipeg River (active and inactive)	√	√	√		***Not significant:*** *Releases controlled so that effluents remain below acceptable standards.*
	Leaks into surface water from in-situ trenches	√	√	√	√	***Not significant:*** *No migration of radioactive contaminants to surface water.*

Component	Description of Residual Effect	Monitoring vs Project Schedule				Comment/Conclusion
		Phases			Post Project	
		1	2	3		
	Soil and Groundwater contamination during remediation	√		√		***Not significant:*** *Use of rain barriers, berms, to keep water from flowing away from site being remediated containment barriers to direct water to drains.*
	Leachate from WMA trenches	√	√	√	√	***Not significant:*** *The hydrogeological conditions at the WMA are favourable for in-situ management of the waste. There is no evidence of upward or lateral migration to date and scoping calculations suggest no significant migration from the WMA will occur (Appendix C). Monitoring performed as part of the follow-up will ensure no undetected migration from the WMA.*
Land and Resource Use	Land-use restriction associated with in-situ disposal of radioactive waste				√	***Not significant:*** *Areas involved very small; especially relative to the total amount of land being released on site.*
	Land-use restrictions associated with in-situ disposal of non-radioactive waste				√	***Not significant:*** *Areas involved very small; land still useable for many purposes.*
Archaeology	Artifact loss during excavations near shores of Winnipeg River			√		***Not significant:*** *The Presence of an Archaeologist during excavations will ensure that artifacts are not destroyed or lost.*

2.2 Follow-up to Support Interim Storage and Final Endstate

A post-decommissioning monitoring program will be established for those areas where a potential need is identified, such as in remediated sites, or in areas such as the Waste Management Area where low-level radioactive materials remain in-situ. The degree of monitoring and surveillance established for each area will be commensurate with radiological hazards or other hazards.

While baseline information is available with respect to most of the decommissioning activities to be undertaken, in some circumstances, baseline information may need to be gathered in order to define and carry out follow-up activities. One such example is the Winnipeg River, where an investigation of the river around and downstream of the outfall has been carried out as part of the CSR [1]. Follow-up monitoring of river sediments will be carried out to confirm that the findings of that assessment remain valid for the final project endstate.

There are three other areas where additional follow-up monitoring can be envisaged at this time. The first is the waste management area where a special investigation to characterize the potential pathways for movement to the surface or laterally was carried out in the fall of 2000. The other two areas are the inactive landfill and the sewage lagoons. Although these areas are not considered to represent a hazard, for precautionary reasons, some follow-up monitoring is proposed. Each of these three areas is shown in Figure 3 and monitoring wells located around the WMA are shown in Figure 4. Enhanced monitoring will build on the existing monitoring array, and additional wells may be installed to gather data required to support interim storage and final endstate goals.

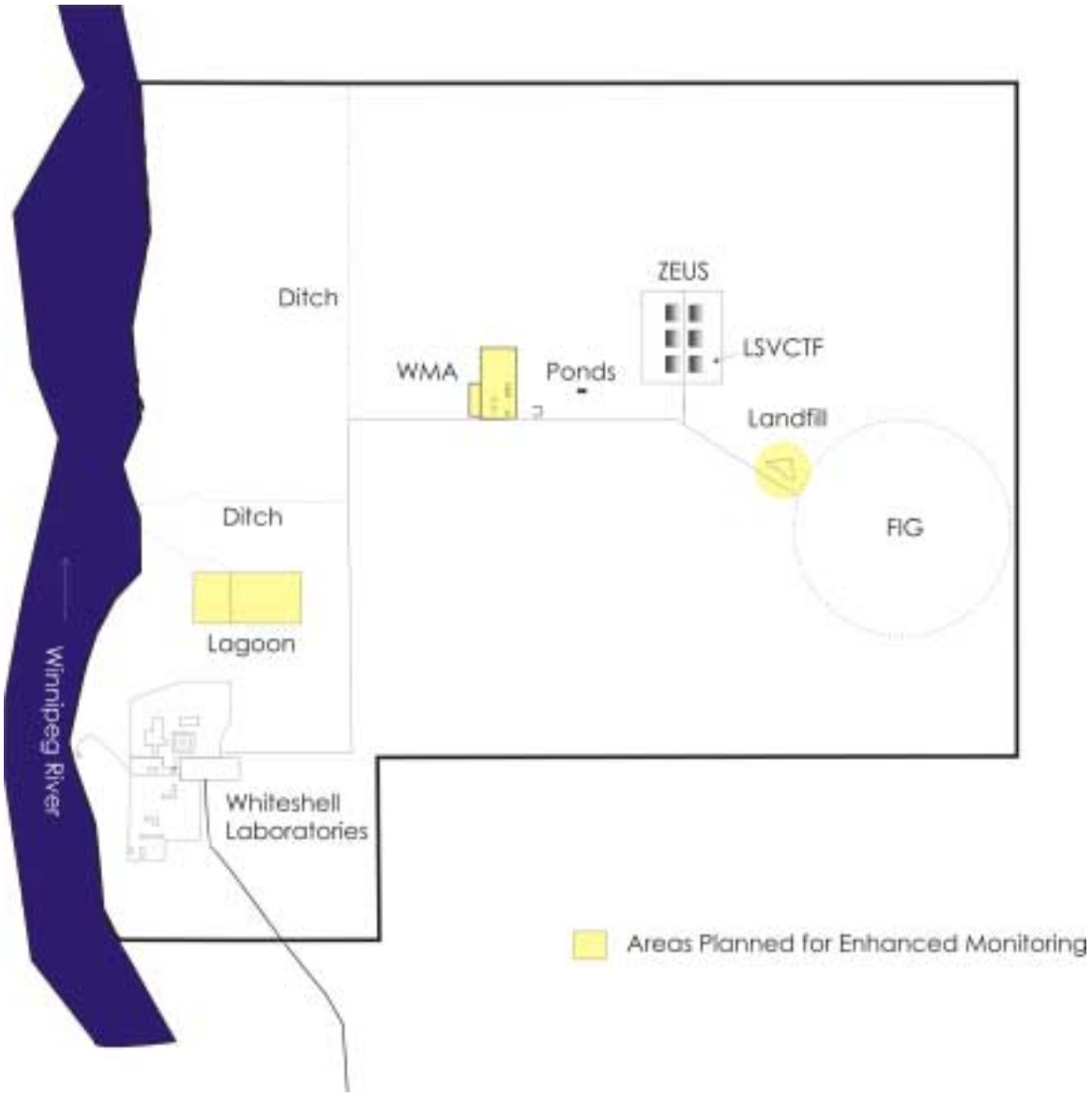


Figure 3: Follow-Up Monitoring Program Map

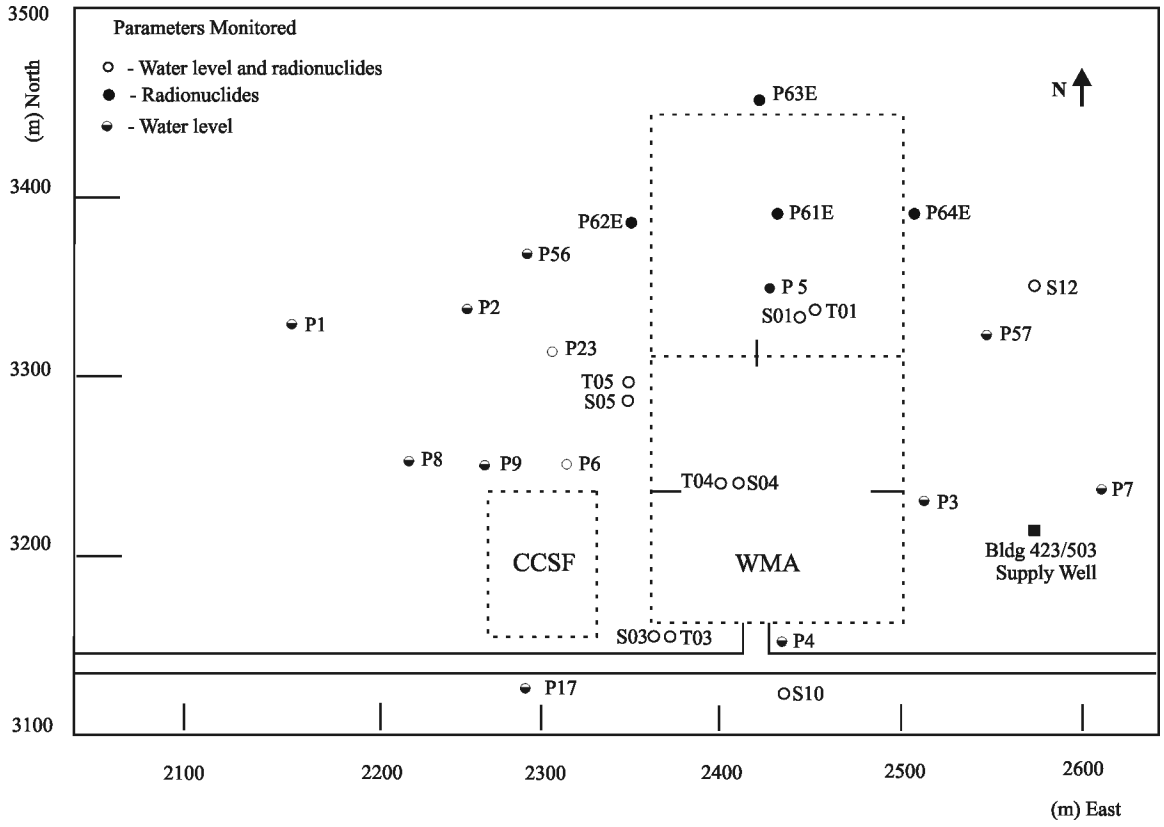


Figure 4: WMA Groundwater Monitoring Locations

Table 3 lists the new monitoring activities proposed.

Table 3: Proposed New Monitoring Activities

Environmental Component	Sampling Location	Parameters
Air	WL Main Site	Dust Particulates
Groundwater	WMA Sewage Lagoons Landfill	Radiological Non-radiological
Sediments	Winnipeg River Deposition Areas	^{137}Cs

2.2.1 Goals for Interim Storage and to Support Final Endstate

Goals for the Waste Management Area

- Assess fitness-for-Service of existing storage facilities*:*

- assess the impact of the continued storage in the existing structures,
- verify that the structures continue to provide adequate containment, and
- in conjunction with hydrogeological data review, establish the priorities and timing on any remedial actions.

- Confirm the WMA hydrogeological conditions to support the case for interim storage and of in-situ disposal of selected LLW trenches*:*

- assess the extent and significance of any contaminant migration from existing engineered facilities and from the trenches,
- determine the fate of non-radiological contaminants present in the LLW trenches and assess the need for their recovery, and,
- assist in the development of the final safety analysis for the planned in-situ disposal of LLW trenches.

2.2.2 Goals for the Inactive Landfill

- ensure that the groundwater quality downgradient of the landfill site remains acceptable, and,
- provide data to develop a closure plan for the landfill site.

2.2.3 Goals for the Sewage Lagoons

- confirm that discharges from the lagoons remain in compliance with the applicable regulatory requirements,
- determine the effects on the local groundwater and the Winnipeg River, specifically compliance with water quality standards, and
- provide data to develop a closure plan for the lagoons.

2.2.4 Goals for River Sediments

- to provide assurance that the conclusions of the Winnipeg River Sediment Assessment, documented in Volume 2 of the Comprehensive Study Report, remain valid over the entire duration of the decommissioning project.

2.3 Public Communication

The need for developing and maintaining communication mechanisms during the decommissioning implementation phase is recognized as being important. AECL is committed to an ongoing communication program and supports the formation of a liaison or advisory committee.

The contact list utilized to effect communication during the EA process forms the basis for identifying interest in and development of a formal communications committee.

2.3.1 Goals for Public Communications

- Solicit interaction with interested parties starting with the CSR contact list,
- Identify key interests for continuing communications, and
- Establish terms of reference for individual committees, etc.

3. IMPLEMENTATION PLAN

The work required to meet the goals of the follow-up program are outlined in individual Work Packages 1 through 9 relative to three follow-up areas:

Environmental Components

Work Package #1	Routine Environmental Monitoring Program
Work Package #2	Air and Meteorology

Interim Storage and Endstate Support

Work Package #3	Fitness for Service of WMA Facilities
Work Package #4	Confirmation of Hydrogeological Conditions at the WMA
Work Package #5	Interim Remediation of WMA Facilities
Work Package #6	Inactive Landfill Enhanced Monitoring
Work Package #7	Sewage Lagoons Enhanced Monitoring
Work Package #8	River Sediments Enhanced Monitoring

Public Communications

Work Package #9	Establish and Maintain Project Communications Mechanisms

3.1 Environmental Components Work Package Descriptions

Work Package #1 – Routine Environmental Monitoring Program

This work package initially maintains the routine monitoring program for the WL site and will adapt to focus on specific decommissioning activities such as facility demolition and land remediation. The aim is to adapt monitoring to allow confirmation of EA conclusions and the effectiveness of remediation measures. Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	Phase 2	Phase 3
1. Maintain routine monitoring program.	√	√	√
2. Evaluate effectiveness of program to adequately monitor decommissioning activities.	√	√	√
3. Implement program changes required to monitor decommissioning work.	√	√	√

Work Package #2 – Air and Meteorology

Follow-up monitoring for this component is planned to initially establish a site baseline against which demolition effects can be measured. Routine collection of meteorological data will be maintained and additional monitoring will be conducted during demolition projects to ensure mitigation measures are effective and that the potential environmental effects remain insignificant. Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Measure and establish baseline parameters on a seasonal basis - establish the monitoring locations, and - collect baseline data.	√		
2. Record Environment Canada site meteorological data.	√	√	√
3. Monitor during actual building demolition - bldgs 400, 406, 408, 415 and other general infrastructure are planned for Phase 1, the nuclear infrastructure is planned for Phase 3.	√		√

3.2 Interim Storage and Endstate Support Work Package Descriptions

Work Package #3 – Fitness for Service of WMA Facilities

The general strategy for the WMA is to manage wastes within existing and, where necessary, new interim storage structures until off-site disposal facilities are available. An exception to this approach is the early retrieval of irradiated fuel from standpipes and retrieval of certain wastes from the trenches, not considered suitable for in-situ disposal.

To help support that strategy, follow-up activities are proposed in two key areas:

- assessment of the fitness-for-service of structures where storage will continue, and,
- confirmation of the hydrogeological condition and containment relative to the existing storage environment and of the final end-state for trenches for which in-situ disposal is planned.

A fitness-for-service evaluation of WMA storage facilities requires evaluation of two components. The first is the actual integrity of the engineered facilities. The second is the geological/hydrogeological condition around individual facilities. Fitness-for-service Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Review and analysis of design, construction and maintenance records.	√		
2. Explore and identify methods to evaluate structural integrity of individual storage structures - non-intrusive; inspection, radiological survey, sump records, geophysical assessments, engineering techniques, etc.	√		
3. Test, then apply selected methods to evaluate structural integrity.	√		
4. Evaluate the potential impact of contaminant transport from individual storage facilities/areas - Non-intrusive geophysical, radiological survey, - core sampling adjacent to selected facilities, and - apply area monitoring data (existing and Work Package 4) to assess hydrogeological conditions and implications for contaminant transport.	√		
5. Establish remediation criteria - contaminant transport impact relative to waste removal to final disposal.	√		
6. Identify facilities where remediation is required and establish time frames.	√		

Work Package #4 – Confirmation of Hydrogeological Conditions at the WMA

Enhanced hydrogeological monitoring will be designed to evaluate the fitness for service of interim storage structures and to provide detailed information required to prepare the final safety case for in-situ disposal of LLW trenches. The Work Tasks to implement enhanced monitoring are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3.**
1. Prepare the detailed plan for the enhanced monitoring system, - establish data quality objectives to satisfy the interim storage and in-situ needs, - compile a comprehensive database to collate historic, site specific monitoring data, - evaluate the existing data and monitoring wells network and identify information gaps, and - if warranted, identify additional monitoring system structure (water wells and soil sampling).	√		
2. Install new monitoring wells and/or refurbish existing wells as required and identify soil sampling locations, parameters and schedule.	√		
3. Monitoring and data collection.	√	√	√
4. Evaluate and report on interim storage environment (input data for Work Task 4 of Work Package #3).	√		
5. Evaluate and assemble data for the safety analysis to support the LLW in-situ endstate.		√	√
6. Prepare the final safety analysis to confirm the in-situ case for LLW trenches.			√

Work Package #5 – Interim Remediation of WMA Facilities

This work package details the plan for remediation for structures/areas where the facility life cycle is not adequate to manage the wastes. For some areas these have already been established. For others the activities conducted in Work Packages 3 and 4 must be completed to identify interim remediation requirements and time frames. Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Recover, process, package and provide enhanced interim storage for wastes from 69 standpipes containing irradiated fuel.		√	
2. Retrieval, processing, packaging and enhanced interim storage provision for wastes in any facilities identified for interim remediation in Work Packages 3 and 4.		√	√
3. Retrieval of LLW trench waste unsuitable for in-situ disposal, - irradiated reactor components from Trench #6.		√	
4. Retrieval of LLW trench waste unsuitable for in-situ disposal, - soil and waste contaminated by WR-1 waste water in Trench 10, - arsenic from Trench #1, and - Tc^{99} from Trench 16.			√

Work Package #6 – Inactive Landfill Enhanced Monitoring

Enhanced landfill monitoring will focus on confirmation of the integrity of the current hydrogeological environment to control groundwater impacts and to provide input data for preparation of a closure plan. Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Prepare the detailed plan for the enhanced monitoring plan. - establish data quality objectives, - assemble existing data (hydrology, geology, geophysics, mapping), - evaluate existing data, and - assess the need for additional monitoring and sampling locations.	√		
2. Install monitoring wells and identify sampling schedule and parameters.	√		
3. Monitoring and data collection.	√	√	√
4. Evaluate interim storage environment.	√	√	
5. Prepare a closure plan.		√	

Work Package #7 – Sewage Lagoons Enhanced Monitoring

Follow-up monitoring for the sewage lagoons will focus on confirming compliance of discharges, assessing effects on groundwater and the Winnipeg River and on developing a closure plan. Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Prepare the detailed plan for the follow-up monitoring program - establish data quality objectives, - assemble existing data (hydrology, geology, geophysics, mapping), - evaluate existing data, and - assess the need for additional monitoring/sampling	√		
2. Establish sampling locations.	√		
3. Monitor and collect data.	√		
4. Evaluate compliance, groundwater impacts	√	√	
5. Prepare a closure plan.		√	

Work Package #8 – River Sediments Enhanced Monitoring

Follow-up monitoring for river sediments is designed to provide assurance that the assessment documented in the CSR remains valid over the project period. Work Tasks are:

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Identify depositional areas above the hydroelectric dam sites for proposed core sampling - Seven Sisters Falls is upstream background, - Powerview, Great Falls, McArthur Falls for downstream sampling locations, - review topography and bathymetry data, - establish criteria for identification of depositional areas, and - pick target sampling sites.	√		
2. Secure agreement with DFO and the CNSC for target sampling sites.	√		
3. Collect and analyze cores for ^{137}Cs from each location to establish current baseline (core depth adequate to capture bomb fallout ^{137}Cs).	√		
4. Resample and analyze at 20, 40 and 60 years to verify validity of EA conclusions.		√	√

3.3 Public Communication Work Package Description

Work Package #9 – Establish and Maintain Project Communications Mechanisms

Public communications activities are planned to provide on-going communications mechanisms in the regional study area to satisfy the needs of municipal governments, First Nations, interest groups and individuals. This is intended to be an interactive process with the public to solicit input and interest in establishing communications methodology.

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
1. Initiate communications through the contact list used for the EA process - update the list to reflect project communications needs, and - assemble contact list into categories dependent on a perceived interest.	√		

Work Tasks	Timing of Activity Relative to Project Time Frame		
	Phase 1	**Phase 2**	**Phase 3**
2. Solicit input to establishing formal/informal communications mechanisms - contact Sagkeeng First Nation and establish continuing communications starting with the existing communications protocol, - contact local municipal governments to solicit interest in routine communications (e.g. formation of a Public Liaison Committee), and - contact associations/individuals to solicit input and to advise on access to project information.	√		
3. Establish communications processes dependent on feedback. Options may include some or all of: - a Public Liaison Committee, - meetings with First Nations, - periodic newsletter, - B401 display/information area, and - responses to individual questions or issues.	√		
4. Conduct routine communications in accordance with the outcome of Steps 1 to 3.	√	√	√

3.4 Implementation Schedule

Additional scheduling detail is presented in the schedule attached in Figure 5.

4. REPORTING

AECL will report on the activities and results of the follow-up program as they are implemented. Detailed program implementation plans will be submitted to the CNSC for approval, as they are developed. A suitable frequency will be determined for reporting the findings of the Enhanced Monitoring Program, annually or as otherwise required by CNSC licensing conditions.

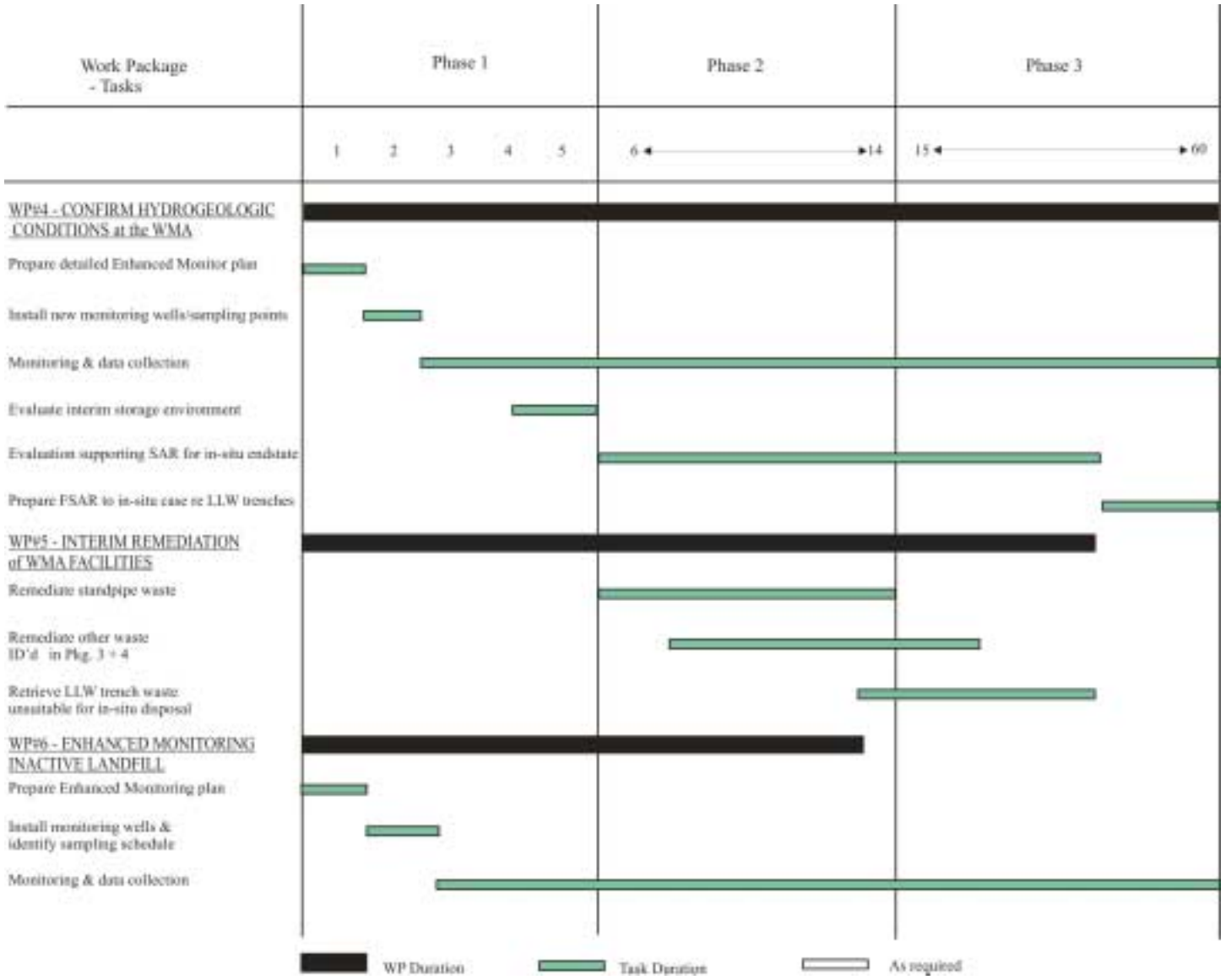
Routine environmental monitoring program results will continue to be reported consistent with the AECL Environmental Protection Program requirements.

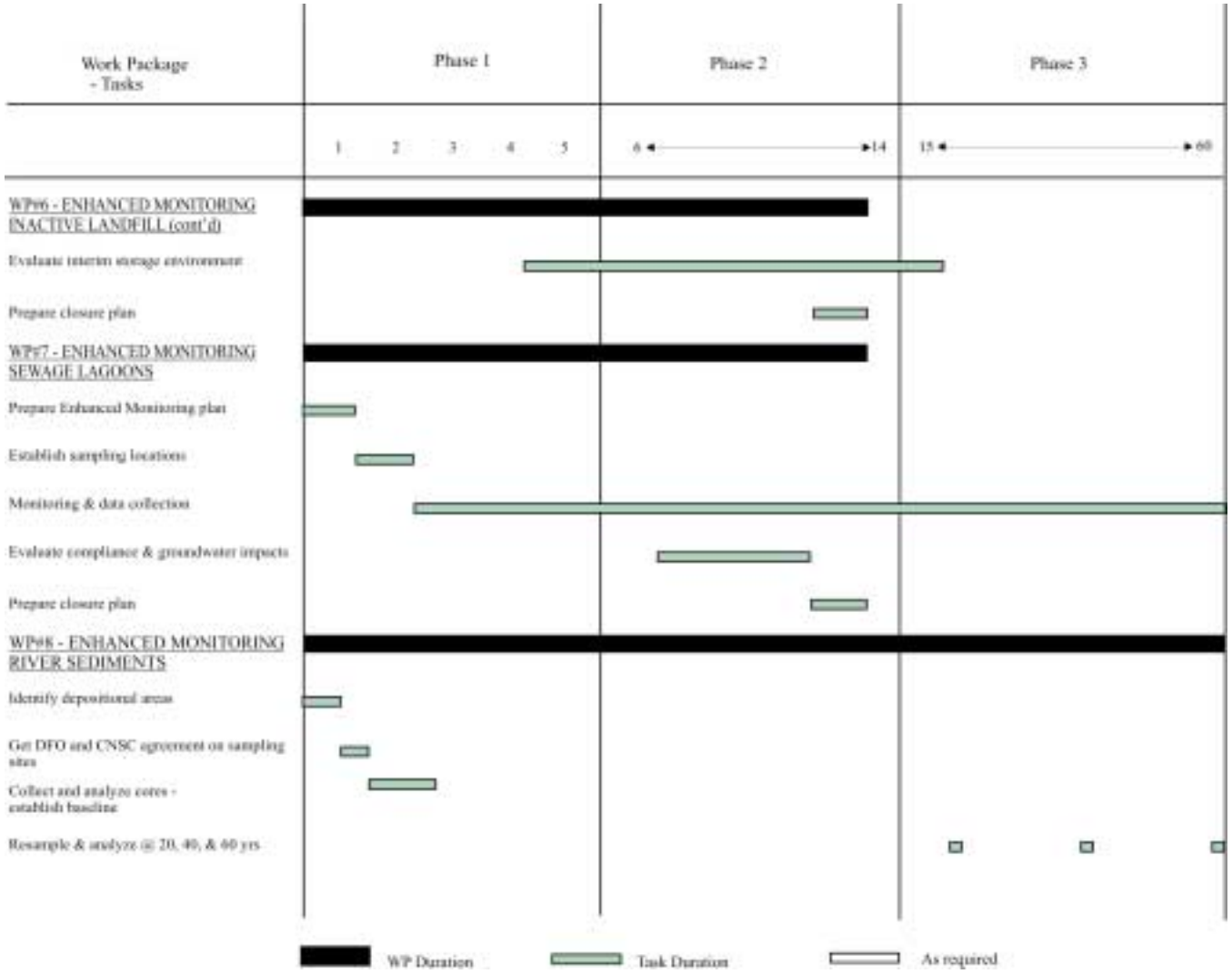
5. REFERENCES

[1] *Whiteshell Laboratories Decommissioning Project Comprehensive Study Report*, Volumes 1, 2, and 3, 2001 March and 2001 November.

[2] Atomic Energy of Canada Limited. 1996. *Environmental Protection Program Manual*. Atomic Energy of Canada Limited Report, RC-2000-021-0.


Work Package
- Tasks
Phase 1
Phase 2
Phase 3
1
2
3
4
5
6
14
15
60
WP#1 - ROUTINE ENVIRONMENTAL MONITORING
Maintain routine monitoring
Evaluate monitoring effectiveness
Implement program changes
WP#2 - AIR & METEOROLOGY
Establish baselines
Record Environment Canada data
Monitor during building demolition
WP#3 - WMA FACILITIES FITNESS
Review construction/maintenance records
Identify assessment techniques
Perform assessments
Assess contaminant transport
Establish remediation criteria
Establish time frame for remediation
WP Duration
Task Duration
As required


Work Package
- Tasks
Phase 1
Phase 2
Phase 3
1
2
3
4
5
6
14
15
60
WP#4 - CONFIRM HYDROGEOLOGIC CONDITIONS at the WMA
Prepare detailed Enhanced Monitor plan
Install new monitoring wells/sampling points
Monitoring & data collection
Evaluate interim storage environment
Evaluation supporting SAR for in-situ endstate
Prepare FSAR to in-situ case re LLW trenches
WP#5 - INTERIM REMEDIATION of WMA FACILITIES
Remediate standpipe waste
Remediate other waste ID'd in Pkg. 3 + 4
Retrieve LLW trench waste unsuitable for in-situ disposal
WP#6 - ENHANCED MONITORING INACTIVE LANDFILL
Prepare Enhanced Monitoring plan
Install monitoring wells & identify sampling schedule
Monitoring & data collection
WP Duration
Task Duration
As required


Work Package - Tasks
Phase 1
Phase 2
Phase 3
1
2
3
4
5
6
14
15
60
WP#6 - ENHANCED MONITORING INACTIVE LANDFILL (cont'd)
Evaluate interim storage environment
Prepare closure plan
WP#7 - ENHANCED MONITORING SEWAGE LAGOONS
Prepare Enhanced Monitoring plan
Establish sampling locations
Monitoring & data collection
Evaluate compliance & groundwater impacts
Prepare closure plan
WP#8 - ENHANCED MONITORING RIVER SEDIMENTS
Identify depositional areas
Get DFO and CNSC agreement on sampling sites
Collect and analyze cores - establish baseline
Resample & analyze @ 20, 40, & 60 yrs
WP Duration
Task Duration
As required

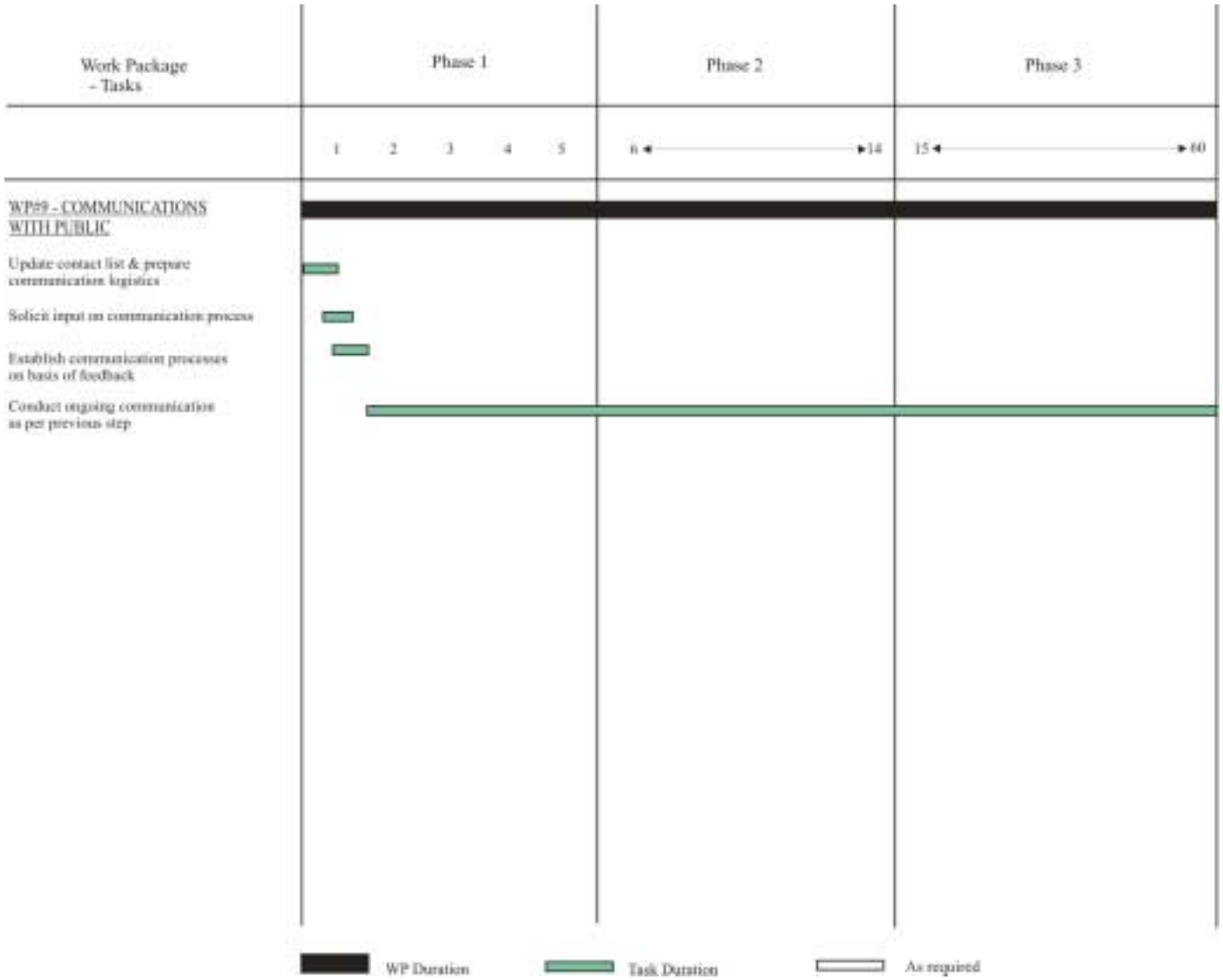


Figure 5: Proposed Schedule for Follow-Up Program Activities