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Our reference: NIL41B0006
Your reference:

18 February 2011

Chief Executive Officer
Necsa
P O Box 582
PRETORIA
0001

FOR THE ATTENTION OF DR RM ADAM

Dear Dr Adam

NUCLEAR INSTALLATION LICENCE NIL-41 (VARIATION 1)

1. Please find enclosed one controlled copy of Nuclear Installation Licence No. NIL-41 (Variation 1), being the nuclear authorisation issued to Necsa for the operation of the Liquid Effluent Treatment Facility Complex. This document must be controlled in accordance with the Necsa arrangements for controlled documents.

2. This revision of NIL-41 was necessitated following the approval of the phase 2 decommissioning of the Molybdenum Transfer Station in the Decontamination Hall in building P-2400.

3. Necsa is reminded that the format for correspondence between **Necsa and the NNR on the Liquid Effluent Treatment Facility Complex** are as follows:
   i. Correspondence **from Necsa to the NNR:** NIL41AXXXX, where "XXXX" is sequential numbers starting with 0001.
   ii. **Correspondence from the NNR to Necsa:** NIL41BXXXX, where "XXXX" is sequential numbers starting with 0001.
   iii. **NNR Authorisation Requests (NAR's)** will be numbered as follows: NIL41-NAR-XXXX, where "XXXX" is sequential numbers starting with 0001.
   Authorisation Change Requests (ACR's) will be numbered as follows: NIL41-ACR-XXXX, where "XXXX" is sequential numbers starting with 0001.
   iv. **Events** will be numbered as follows: NIL41-OCC-XXXX, where "XXXX" is sequential numbers starting with 0001.

2./...

4. The issue of this nuclear authorisation does not relieve Necsa of any obligations under any other legislation.

Yours faithfully

Adv BM Mkhize
CHIEF EXECUTIVE OFFICER

Copy: Group Executive: NTI
LD Records

NUCLEAR INSTALLATION LICENCE No. NIL-41 (Variation 1)

Nuclear Installation Licence No. NIL-41 (Variation 1) issued in terms of the provisions of Section 23 of the National Nuclear Regulator Act, Act 47 of 1999 (hereinafter referred to as the Act)

to

THE SOUTH AFRICAN NUCLEAR ENERGY CORPORATION (Necsa)
(hereinafter referred to as the Licensee)

for

the operation of the **Liquid Effluent Treatment Facility Complex** on the farm Weldaba 567 JQ (formerly Welgegund 491 JQ), in the magisterial district of Brits in the North West Province, known as the Pelindaba site. The site referred to in this licence refers to the defined portion of the Pelindaba site on which the Liquid Effluent Treatment Facility Complex is constructed (see Figure 1).

The Nuclear Installation Licence is not transferable and is effective from the date of issue, subject to adherence with –

(i) the Conditions of Authorisation in PART A; and
(ii) the Specified NNR Requirements in PART B.

Issued at Centurion on this 24th day of February 2011

CHIEF EXECUTIVE OFFICER

PARTA: CONDITIONS OF AUTHORISATION

1. General

a. In these conditions any reference to an agreement, approval, directive, specification, notification, process or any formal communication between the NNR and the licensee, and vice versa, shall be deemed to be a reference to a written document.

b. In these conditions any reference to approved processes and or procedures shall be deemed to be licensee processes and or procedures.

c. In these conditions any reference to NNR approved processes and or procedures shall be deemed to be licensee processes and or procedures that have been reviewed and approved by the NNR.

d. The licensee must ensure that once approved no alteration or amendment is made to the NNR approved processes and or procedures unless the NNR has approved the said alteration or amendment.

e. Where in these conditions, the NNR requires any matter to be approved or to be carried out only with its consent or to be carried out as it directs, the NNR may –
   i. from time to time modify, revise or withdraw, either wholly or in part, any such approval, directive or consent;
   ii. approve, either wholly or in part, any modification or revision or any proposed modification or revision to any matter for the period being approved.

f. The English text of the licence is the official text of the licence.

2. Facility Description

The **Liquid Effluent Treatment Facility Complex** is situated on the Pelindaba East side of the Pelindaba site. This facility was constructed in 1963 for the handling of all liquid effluent generated on the Pelindaba site.

The **Liquid Effluent Treatment Facility Complex** consists of the following facilities or sub-processes:

1. **Industrial Effluent Treatment Facility.**
2. **Low Active Effluent Treatment Facility.**
3. **Medium Active Effluent Treatment Facility.**
4. **Solidification Facility.**
5. **Laundry.**
6. **Hot Yard.**

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7. **Decontamination Hall.**
8. **Volume Reduction Facility.**

All the facilities that constitutes the Liquid Effluent Treatment Facility Complex, (for example Building P-2400, the Hot Yard, the sludge beds, the Industrial Effluent and Low Active release tanks as well as Building P-2401 that houses the Dissolved Air Flotation Facility (DAFF) plant) are fenced with a security fence and covers an area of approximately 15 750 m^2.

Building P-2400 is equipped with a ventilation system with inlet fans, extraction fans with filtration and a building stack. Building P-2400 is a T-shaped building and consists of an office block, services wing running east-west and the plant wing running north-south.

The service wing comprises:

- A basement, housing electrical equipment and ventilation services rooms.
- A ground floor, housing the Decontamination Hall, the Laundry, change rooms, a tea-room and the administrative section.
- A first floor, housing offices.

The plant wing comprises:

- Process equipment for treating liquid and solid radioactive waste.
- The process plant control room.
- Maintenance workshops.
- A chemical mixing room.
- Ventilation equipment.
- Additional offices and stores.

a. Industrial Effluent Treatment Facility

The Industrial Effluent Facility is situated to the west of Building P-2400 and consists of:

i. Industrial Effluent Receiving Tanks: IE1, IE2, IE3, IE4 and IE5 of 720 m^3 capacity each.
ii. Industrial Effluent Release Tanks: IE8, IE9, IE10 and IE11 of 720 m^3 capacity each.
iii. Sludge Drying Beds: SDB3, SDB4, SDB5 and SDB6.
iv. The Dissolved Air Flotation Facility (DAFF) situated in Building P-2401.

b. **Low Active Effluent Treatment Facility**
The Low Active Effluent Treatment Facility is situated in the plant wing of Building P-2400 with some components situated to the south of Building P-2400 and consists of:
i. LA receiving tanks 46/1, 46/2 and 46/3 of 120 m^3 capacity each.
ii. The LA treatment facility.
iii. LA release Tanks LA6 and LA7 of 720 m^3 capacity each.

c. **Medium Active Effluent Treatment Facility**
The Medium Active Effluent Treatment Facility is situated in the plant wing of Building P-2400 and consists of:
i. Medium Active Effluent Receiving Tanks 1/1 and 1/2 of 48 m^3 capacity each.
ii. Medium Active Effluent Receiving Tanks 21/1 and 21/2 of 46 m^3 capacity each.
iii. Medium Active Effluent Building Tanks 2/1 and 2/2 of 14m^3 capacity each.
iv. A low salts evaporator.
v. A high salts evaporator.

The condensates from the evaporators are collected, sampled, analysed and depending on its radioactive contents treated as low active effluent.
The concentrates from the evaporators are immobilised and managed as solid waste.

d. **Solidification Facility**
The Solidification Facility is situated in the plant wing of Building P-2400 with the drum preparation area and curing area situated in the HotYard.

The Solidification Facility is used for the transfer to and solidification of Medium Active Effluent evaporator concentrates in waste containers in preparation for storage.

e. **Laundry**
The Laundry is situated in the service wing of Building P-2400 and is used to wash radioactively contaminated laundry as well as non-contaminated laundry.

The Laundry consists of:
i. Reception and dispatch areas.
ii. A non-active washing area for the washing of laundry that is not radioactively contaminated.
iii. An active wash area for the washing of laundry that is or may potentially be radioactively contaminated.

iv. An area for the repair of laundry.
v. An area for the monitoring of washed laundry that is or may potentially be radioactively contaminated.

f. **Hot Yard**

The Hot Yard is situated inside the perimeter fence surrounding the Liquid Effluent Treatment Facility and to the east of Building P-2400. The Hot Yard is enclosed by a wire fence ± 1.8 meters high. The floor for the Hot Yard is a combination of a concrete slab, asphalt and soil.

The Hot Yard contains the following areas:

i. **Hot Yard Interim Drum Storage Area**
The Hot Yard Interim Drum Storage Area is the concrete and asphalt section of the Hot Yard inside the wire fence and excludes the Molybdenum Decay Storage Area. This interim storage area is utilised for the interim storage of waste containers awaiting transfer.

ii. **Flammable Liquid Store**
The Flammable Liquid Store is a lockable store for flammable liquids and lubricants situated on the south-western side of the Hot Yard. This store is manufactured of wire mesh with a corrugated iron roof.

iii. **Carboy Store**
The Carboy Store is a lockable store with corrugated iron roof and walls situated on the north-eastern side of the Hot Yard. This store is utilised for the storage of carboys containing radiological contaminated organic or inorganic liquid waste.

iv. **Molybdenum Decay Storage Area**
The Molybdenum Decay Storage Area is an open area in the south eastern corner of the P-2400 fenced area and to the south of the Hot Yard Interim Drum Storage Area. Radioactive wastes from the production process of Molybdenum by NTP are stored in this area in concrete decay containers to decay to specified radiation levels.

v. **The Bunker**
The Bunker is situated against the eastern wall of the plant wing of Building P-2400. The Bunker is a sealed concrete basement used for the storage of redundant DPTE containers, disused sealed sources and contaminated items.

vi. **Solidification Drum Preparation Area**
The Solidification Drum Preparation Area is situated between the Flammable Liquid Store and The Bunker. This area has walls and roofs manufactured of corrugated iron in which drums used in the solidification process are prepared prior to being transferred to the Solidification Facility for filling.

vii. **Solidification Drum Curing Area**
The Solidification Drum Curing Area is situated against the eastern wall of the plant wing of Building P-2400 just outside the Solidification Facility and is used as a waiting and curing area for waste containers to and from the solidification process.

g. **Decontamination Hall**
The Decontamination Hall is situated in the north eastern corner of the service wing of Building P-2400. The Decontamination Hall is divided into two separate areas, namely, the Decontamination Area and Moly Transfer Area.

i. The following processes are situated in the **Decontamination Area**:

1. **Filter Press**
The Filter Press is situated next to the northern wall of the Decontamination Area. The Filter Press is used for the drumming of contaminated ventilation filters removed from facilities on the Pelindaba site.

2. **Vapour Blaster**
The Vapour Blaster is situated next to the northern wall of the Decontamination Area next to the Filter Press. The Vapour Blaster is used for the decontamination of radioactively contaminated tools and small equipment.

3. **Tent**
The Tent is situated against the southern wall in the Decontamination Area and is used for the size reduction and drumming of waste originating from Building P-2400 for transfer.

4. **Wash Bay**
The Wash Bay in the Decontamination Area is situated to the south of the Filter Press and against the wall dividing the Decontamination Hall. This Wash Bay is used for the wet decontamination of radioactively contaminated equipment and tools originating from the Liquid Effluent Treatment Facility.

ii. The following processes are situated in the **Moly Transfer Area**:

1. **Moly Waste Repacking Area**
The available open floor space in the Moly Transfer Area is utilised for the repacking of molybdenum decay storage containers. Molybdenum waste complying with specified radiation levels are repacked into different containers for decay or storage.

2. **Hot Cell**
The Hot Cell is situated in the middle of the Moly Transfer Area and was previously used for the transfer of canisters containing waste from the Radiochemicals Facility in P-1701 to the Nuclear Waste Services transfer flask as well as the seal welding of canisters containing disused sealed sources.

3. **Molybdenum Waste Transfer Station**
The Molybdenum waste Transfer Station is situated against the southern wall of the Moly Transfer Area. It was previously used for the transfer of wastes originating from the Radiochemicals Facility in P-1701 to concrete decay containers to be stored in the Molybdenum Decay Storage Area.

h. **Volume Reduction Facility**
The Volume Reduction Facility is situated in the plant-wing section of Building P-2400 close to the Laundry and also exits into the Hot Yard. The Volume Reduction Facility was used to compress steel waste drums containing radioactive waste to reduce the volume of such waste prior to storage.

3. Scope of Actions that may be undertaken by the Installation

a. **Industrial Effluent Treatment Facility** is authorised for the following activities –

i. Receipt of industrial effluent generated on the Pelindaba site in the Industrial Effluent receiving tanks at P-2400.
ii. Treatment of industrial effluent in the Dissolved Air Flotation Facility.
iii. Receipt of treated industrial effluent in the Industrial Effluent release tanks.
iv. Transfer of industrial effluent sludge to sludge drying beds SDB3, SDB4, SDB5 and SDB6 for drying.
v. Drumming of dried sludge to be treated as solid waste.
vi. Transfer of non-radioactive waste to authorised waste removal contractors.

vii. Discharge of treated industrial effluent from the Industrial Effluent release tanks to the Crocodile River.

b. The **Low Active Effluent Treatment** is authorised for the following activities –
   i. Receipt of Low Active Effluent in receiving tanks through pipelines or transported by road tanker from the facilities on the Pelindaba site.
   ii. Treatment of Low Active Effluent in the Liquid Effluent Treatment Facility through chemical precipitation.
   iii. Transfer of Low Active Effluent precipitate to sludge drying beds SDB1 or SDB2 for drying.
   iv. Drumming of dried sludge to be treated as solid waste.
   v. Discharge of treated Low Active Effluent from the Low Active release tanks to the Crocodile River.

c. The **Medium Active Effluent Treatment** is authorised for the following activities –
   i. Receipt of Medium Active Effluent through pipelines from Building P-1700 and P-1800 in receiving tanks in the Liquid Effluent Treatment Facility.
   ii. Evaporation of Medium Active Effluent in the low salts evaporator and the high salts evaporator.
   iii. Transfer of evaporator condensate to holding tanks for sampling and further treatment as Low Active Effluent.
   iv. Transfer of evaporator concentrates to the Solidification Facility for solidification.

d. The **Solidification Facility** is authorised for the following activities –
   i. Receipt of evaporator concentrates to be solidified.
   ii. Solidification of evaporator concentrates.
   iii. Interim storage of solidified waste in waste containers in the Solidification Drum Curing Area outside the Solidification Facility.
   iv. Transfer of solidified waste in waste containers to the Hot Yard Interim Drum Storage Area for storage.

e. The **Laundry** is authorised for the following activities –
   i. Receipt of contaminated, uncontaminated and potentially contaminated protective clothing for washing.
   ii. Washing, drying and ironing of protective clothing.
   iii. Repairing of protective clothing.
   iv. Transfer of washed protective clothing to facilities of origin.

f. The **Hot Yard** is authorised for the following activities –
   i. The **Hot Yard Interim Drum Storage Area** is authorised for the following activities –
      1. Receipt of waste containers originating from the Liquid Effluent Treatment Facility Complex.

2. Storage of waste containers.
3. Transfer of waste containers to facilities authorised to receive said waste containers.

ii. **Flammable Liquid Store**
1. Receipt of non-radioactive flammable liquids and lubricants.
2. Storage of non-radioactive flammable liquids and lubricants.

iii. The **Carboy Store** is authorised for the following activities –
1. Receipt of organic and inorganic radioactively contaminated liquid waste in carboys.
2. Storage of organic and inorganic radioactively contaminated liquid waste in carboys.
3. Transfer of carboys to facilities authorised to receive said waste.

iv. The **Molybdenum Decay Storage Yard** is authorised for the following activities –
1. Receipt of concrete decay containers.
2. Storage of concrete decay containers.
3. Transfer of the decay storage containers to the Decontamination Hall in Building P-2400 and facilities authorised to receive said containers.

v. The **Bunker** is authorised for the following activities –
1. Storage of radioactive material and radioactively contaminated items.

vi. **Solidification Drum Preparation Area**
1. Receipt of raw material and equipment for drum preparation.

vii. The **Solidification Drum Curing Area** is authorised for the following activities –
1. Receipt of prepared and solidified waste containers.
2. Interim storage of solidified waste containers in the curing phase.
3. Transfer of solidified waste containers to the Hot Yard Interim Drum Storage Area.

g. **Decontamination Hall**
The Decontamination Hall is divided into two separate areas, namely, the Decontamination Area and Moly Transfer Area.

i. The following processes are situated in the Decontamination Area:

1. The **Filter Press** is authorised for the following activities -
a. Receipt of radioactive contaminated ventilation filters.

b. Drumming of radioactively contaminated ventilation filters removed from facilities on the Pelindaba site into waste containers.
c. Transfer of drummed filters to authorised facilities.

2. The **Vapour Blaster** is authorised for the following activities -
   a. Decontamination of radioactively contaminated tools and small equipment originating from The Liquid Effluent Treatment Facility Complex.

3. The **Tent** is authorised for the following activities -
   a. Size reduction and of waste originating from building P-2400.
   b. Drumming of said waste.
   c. Transfer of waste generated in the facility to facilities authorised to receive said waste.

4. The **Wash Bay** is authorised for the following activities -
   a. Wet decontamination of radioactively contaminated equipment and tools originating from the Liquid Effluent Treatment Facility in Building P-2400.

ii. The following processes are situated in the Moly Transfer Area:

1. The **Moly Waste Repacking Area** is authorised for the following activities -
   a. Receipt of concrete moly decay containers.
   b. Repacking of waste from concrete moly decay containers into different containers.
   c. Transfer of moly waste containers to facilities authorised to receive said containers.

2. The **Hot Cell** is authorised for the following activities -
   a. Care and Maintenance activities limited to inspections, radiological protection surveillance monitoring, maintenance and housekeeping.
   b. Storage of redundant contaminated equipment and waste originating from the decommissioning of this facility.
   c. Transfer of waste generated in the facility to other facilities authorised to receive said waste.

3. The **Molybdenum Waste Transfer Station** is authorised for the following activities -
   a. Phase 2 decommissioning as described in condition B-7.7 of Part B-7 of this Nuclear Installation Licence.

b. Storage of redundant contaminated equipment and waste originating from the decommissioning of this facility.
c. Transfer of waste generated in the facility to other facilities authorised to receive said waste.

h. The **Volume Reduction Facility** is authorised for the following activities –
   a. Phase 2 decommissioning as described in condition B-8.2 of Part B-8 of this Nuclear Installation Licence.

4. Demarcation of Site Boundary, Site Plans, Designs and Specifications

a. The licensee must maintain a plan of the site (hereinafter called the site plan) showing the location of the boundary of the site and every building, plant or facility on the site.

b. The licensee must demarcate the boundaries of the site by fences or other appropriate means and all such fences or other means used for this purpose must be properly maintained.

c. Prior to making any change to the site, which impacts or has the potential to impact on health, safety, or the environment as contemplated in the Act, the licensee must submit to the NNR an amended site plan and schedule, for approval.

d. The licensee must submit, to the NNR, such plans, diagrams, designs, specifications, or other information relating to the buildings, plants or any other facilities on the site as the NNR may specify.

5. Physical Security

a. The licensee must ensure the safety and security of the –
   i. site; and
   ii. all installations and persons thereon,

b. The physical protection system must be designed to protect against the design basis threat, theft or diversion of radioactive material and sabotage.

c. The licensee must prevent unauthorised persons from entering the site or any part thereof.

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6. Transport

a. The transportation of radioactive material or any equipment or objects contaminated with radioactive material must be carried out in compliance with the relevant provisions of the International Atomic Energy Agency's Regulations for the Safe Transport of Radioactive Material, 2005 Edition, IAEA Safety Standard Series No. TS-R-1, IAEA, Vienna, 2005.

b. The licensee must ensure that no radioactive material is brought onto the site or conveyed from the site, except in accordance with processes approved by the NNR.

c. All on site transport of radioactive material or any equipment or objects contaminated with radioactive material must be carried out in compliance with processes approved by the NNR.

d. The licensee must keep a record of all radioactive material consigned to and from the site. Such record must –
   i. contain particulars of the amount, type and form of such radioactive material, the manner in which it was packaged, the name and address of the person to whom it was consigned to or from and the date when it left or arrived on the site.
   ii. be preserved for a period acceptable to the NNR.

e. The licensee must not undertake any transport of radioactive material to sites, installations or persons not appropriately authorised to receive such material.

7. Restrictions on Dealing with the Site

a. The licensee may not lease, assign, or grant possession to use –
   i. the site, or any portion thereof; or
   ii. any radioactive material,
   to any person not in possession of an appropriate nuclear authorisation, where such an authorisation is required.

b. The licensee must inform the NNR in writing of such intention and request the revocation or amendment of the relevant part of the authorisation as appropriate.

c. The licensee remains responsible for compliance with all conditions of authorisation until such time as said conditions are revoked or amended.

d. The licensee must prevent persons from carrying out any unauthorised actions on the site.

e. The licensee must ensure that no radioactive material intended for use in connection with any new installation, process or modification to the existing installation is brought onto site for the first time without consent of the NNR.

f. The licensee must ensure that no radioactive material is stored on the site except in accordance with processes approved by the NNR.

g. The licensee must ensure that every person authorised to be on the site receives instructions (to the extent that this is necessary having regard to the circumstances of that person being on the site) as regards the risks and hazards associated with the nuclear installations and their operation, the precautions to be observed in connection therewith and the actions to be taken in the event of an accident or emergency on the site.

h. The licensee must implement approved processes for suitable training of all persons who have responsibilities for any operations which may affect safety.

i. The licensee must ensure that suitable and sufficient methods are employed on the site for the purposes of informing persons thereon of each of the following matters –
   i. the meaning of any warning sign used on the site;
   ii. the location of any exit from any place on the site, where such exit is provided for use in the event of an emergency;
   iii. the measures to be taken by such persons in the event of any emergency.

8. Radiological Protection

a. The licensee must implement the approved processes for the purposes of ensuring radiological protection of employees, members of the public and the environment, both on the site and off the site, as a consequence of authorised actions.

b. The normal operational exposure of individuals must be restricted to ensure that neither the effective dose nor the equivalent dose to relevant organs or tissues exceeds any relevant dose limit specified by the NNR.

c. The licensee's radiological protection processes must, under all operating states of the authorised actions or facilities ensure that–
   (i) effective radiation doses, including committed effective doses, to persons;
   (ii) the number of people who are exposed; and
   (iii) the likelihood of incurring exposures to radiation,
   are kept as low as reasonably achievable.

d. A dose register of every occupationally exposed worker must be established and maintained in a form acceptable to the NNR. The licensee must retain the register for a period of at least fifty years from the date of last entry.

e. The licensee must implement NNR approved processes for the purposes of control of radioactive sources.

9. Medical Surveillance and Health Register

a. A comprehensive medical surveillance programme and health register must be maintained in a form approved by the NNR.

b. All entries in the health register must be made by an appointed medical practitioner or a person so authorised.

c. The appointed medical practitioner must inform the employee of any medical condition, which could have arisen as a result of occupational exposure to radiation.

d. The licensee must retain the register for a period of at least fifty years from the date of last entry.

e. An employee or former employee must have right of access to his medical records and health register at all times.

10. Radioactive Waste Management

a. The licensee must implement NNR approved processes for the minimisation and safe management of radioactive waste on the site.

b. The radioactive waste management programme must –
   i. ensure the identification, quantification, characterisation and classification of any radioactive waste generated;

ii. provide for the necessary steps leading to safe clearance, authorised discharge, disposal, reuse or recycling; and
iii. provide for the safe storage of radioactive waste between any waste management processes.

c. The safety of radioactive waste storage options must be assured for the envisaged period of storage.

11. Documents, Records, Authorities and Certificates

a. The licensee must keep adequate records to demonstrate compliance with the conditions of this licence.

b. The licensee must implement and maintain an approved document management system to ensure that every document required, every record made, every authority, consent or approval granted and every directive or certificate issue in pursuance of these conditions of licence is preserved for 30 years or such other period as the NNR may approve.

c. Operational reports must be submitted to the NNR at predetermined periods, approved by the NNR, and must contain such information as the NNR may require on the basis of the nuclear installation's safety assessment.

12. Events, (including Incidents or Accidents) on the Site

a. The licensee must implement NNR approved processes for the notification, recording, investigation and reporting and closeout of events (incidents, accidents, etc.) occurring on the site –
i. in accordance with requirements specified by the NNR;
ii. as required by any other condition attached to this licence; or
iii. as the licensee considers necessary.

13. Emergency Planning and Preparedness

a. The licensee must implement NNR approved processes related to preparedness for and response to any event, (incident, accident, etc) or other emergency arising on the site and their associated impacts.

b. The licensee must ensure that such processes include procedures to ensure that all persons, in the employ of the licensee, who have duties in connection with such processes are properly trained and instructed in –

i. the performance of the processes;
ii. the use of any equipment that may be required; and
iii. the precautions to be observed.

c. Where such processes require the assistance or cooperation of, or it is expedient to make use of the services of any person, local authority or any other body; the licensee must ensure that such persons, local authority or other body are consulted in the periodic review and update of such processes.

d. The licensee must ensure that all such processes are exercised and tested at such intervals and at such times and to such extent as the NNR may specify or, where the NNR has not so specified, as the licensee considers necessary to ensure their continued viability.

14. Environmental Protection

a. The licensee must implement NNR approved processes for the protection of public health and the environment arising from the nuclear installation's authorised activities.

b. The licensee must ensure that no radioactive effluent release is made from the site except in accordance with procedures and processes approved by the NNR.

c. The licensee must implement NNR approved processes and procedures for environmental monitoring and surveillance.

15. Duly Authorised and Suitably Qualified and Experienced Persons

a. The licensee must implement NNR approved processes and procedures for ensuring that only suitably qualified and experienced persons perform any duties, which may affect the safety of operations on the site, or any duties assigned by or under these conditions of licence.

b. Such processes and procedures must make provision for the appointment, as appropriate, of duly authorised persons to control and supervise operations, which may affect plant or facility safety.

16. Safety Committee

a. The licensee must implement processes and procedures relating to safety committee(s) to oversee and manage its safety responsibilities and to which it refers for consideration and advice –
   i. matters required by or under this licence;
   ii. safety policies, procedures, processes or documents required by these conditions of licence or as the NNR may specify and any subsequent alteration or amendment to said processes or documents;
   iii. any matter affecting safety on or off the site which the NNR may specify; and
   iv. any other matter, which the licensee considers should be referred to a safety committee.

b. The terms of reference of any such safety committee must be submitted to the NNR.

c. The licensee must ensure that the members of any such committee are suitably qualified and experienced, so as to enable said committee to consider any matter likely to be referred to it and to advise the licensee authoritatively and, so far as practicable, independently.

d. The licensee must ensure that a safety committee shall consider or advise only during the course of a properly constituted meeting of that committee. Minutes must be kept of all such meetings

17. Safety Documentation

a. The licensee must implement NNR approved processes and procedures for the production and assessment of safety cases consisting of documentation to justify safety during the following lifecycle phases of the installation –
   i. Siting;
   ii. Design;
   iii. Manufacture of component parts;
   iv. Construction;
   v. Commissioning;
   vi. Operation;
   vii. Termination of operation;
   viii. Decontamination; and
   ix. Decommissioning.

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b. The safety case must include a risk assessment and demonstration of compliance with the Regulations on Safety Standards and Regulatory Practices as well as any other requirements and guidance prescribed by the NNR.

c. The licensee must establish and implement processes for the periodic and systematic review and reassessment of safety cases.

d. The licensee must if so directed by the NNR, carry out a review and reassessment of safety and submit a report of said review and reassessment to the NNR at such intervals, within such period and for such matters or operations as may be specified in the directive.

18. Quality and Safety Management

a. Quality and Safety Management processes and procedures must be established implemented and maintained in respect of all matters that may affect safety in order to ensure compliance with the conditions of this licence.

b. The licensee must comply with all NNR approved or NNR accepted documents contained in the Necsa Process Based Licensing (PBL) Manual.

c. The licensee must submit to the NNR such copies of records or documents made in connection with the aforementioned processes and procedures as the NNR may specify.

19. Modification to Design of Existing Plant or Facility

a. The licensee must comply with NNR approved processes and procedures relating to control of modification to the design of existing plant, facility or system design including modifications that may be of a temporary nature.

b. The aforesaid processes must provide for the classification of modifications according to their safety significance.

c. Where appropriate modifications must be divided into stages and where the NNR has so specified the licensee must not commence nor thereafter proceed from one stage to the next of the modification without the prior approval of the NNR.

d. The processes must include a requirement for the provision of adequate documentation to justify the safety of the proposed modification and shall where appropriate provide for the submission of such documentation to the NNR.

20. Construction and Commissioning of Plant or Process

a. The licensee must implement NNR approved processes and procedures relating to the construction and commissioning of any plant, facility or process.

b. Where appropriate, construction and commissioning of the plant or process may be divided into stages. If so specified by the NNR, the licensee must not commence with any stage nor proceed from one stage of the construction or commissioning to the next without the prior approval of the NNR.

21. Limits and Conditions on Operations

a. The licensee must, in respect of any operation that may affect safety, produce a safety case to demonstrate the safety of the operation and identify the limits and conditions necessary in the interest of safety. The limits and conditions of operation must be submitted to the NNR for approval.

b. The licensee must ensure that operations are controlled and carried out in compliance with NNR approved limits and conditions on operations at all times.

c. Where the person appointed in terms of paragraph 15 (a) identifies any matter indicating that the safety of any operation or the safe condition of any plant is compromised, that person must bring it to the attention of the relevant facility management, who must forthwith take appropriate action to ensure that the matter is appropriately notified, recorded, investigated and reported to the NNR.

d. The NNR may in the interests of safety, at any time revoke, amend or impose any limiting condition on operations.

22. Examination, Inspection, Maintenance and Testing

a. The licensee must implement NNR approved processes for the regular, periodic and systematic examination, inspection, maintenance and testing of all plant, systems, structures and components, including software.

b. The aforesaid processes must provide for the preparation of a plant maintenance schedule for each plant or facility. The licensee must submit to the NNR for its approval, such part or parts of any plant maintenance schedule as the NNR may specify.

c. The licensee must ensure that a full and accurate report of every examination, inspection, maintenance or test, of any part of a plant, system, structure or component, indicating the date thereof and signed by a suitably qualified and experienced person appointed by the licensee, is made.

d. The licensee must ensure, in the interests of safety, that examination, inspection, maintenance and test of a plant or any part thereof is carried out –
   i. only by suitably qualified and experienced persons;
   ii. in accordance with written procedures;
   iii. within the intervals specified in the plant maintenance schedule; and
   iv. under the control and general supervision of a suitably qualified and experienced person appointed by the licensee for that purpose.

e. When any examination, inspection, maintenance or test of any part of a plant reveals any matter indicating that the safe operation or safe condition of that plant may be affected, the suitably qualified and experienced person appointed to control or supervise any such examination, inspection, maintenance or test shall forthwith bring it to the attention of the relevant facility management who shall take appropriate action and ensure the matter is then notified, recorded, investigated and reported in accordance with approved processes.

23. Decommissioning

a. The licensee must implement NNR approved processes for the decommissioning of facilities or any part thereof on the site.

b. The Licensee must submit for approval a decommissioning plan, as early as possible in the life cycle of the activity or facility. The plan should be revisited and updated as necessary.

c. A detailed decommissioning plan must be submitted to the NNR for approval prior to the commencement of decommissioning activities.

d. It must be demonstrated to the NNR that sufficient resources will be available from the time of cessation of operations until termination of the period of responsibility.

e. Where appropriate decommissioning may be divided into stages. If so specified by the NNR, the licensee may not commence with nor proceed from one stage of the decommissioning to the next without the prior approval of the NNR.

f. The Licensee must establish and maintain a list of all contaminated areas on the site, which will require decontamination in the future.

24. Organizational Change

a. The Licensee must implement NNR approved processes to control any change to its organizational structure or resources that may have a bearing on health, safety and the environment as contemplated in the Act.

b. The processes must provide for the classification of changes to the organizational structure or resources according to their safety significance.

c. The processes must include a requirement for the provision of documentation to justify the safety of the proposed change and shall where appropriate provide for the submission of such documentation to the NNR.

25. Financial Security

a. The Licensee must annually provide proof to the NNR that any claim for compensation to an amount contemplated in Section 30(2) of the Act can be met.

26. Public Safety Information Forum

a. In order to inform the persons living in the municipal area in respect of which an emergency plan has been established, in terms of Section 38(1) of the Act, on nuclear and radiation safety matters, the Licensee must establish a Public Safety Information Forum as prescribed.

27. Inspection Programme

a. Pursuant to the provisions of Section 26(2) of the Act, the Licensee must implement an inspection programme to ensure compliance with all conditions of the nuclear installation licence.

28. Display of the Nuclear Installation Licence

a. To ensure public access to the conditions specified in this licence, the Licensee must at all times display copies of this Nuclear Installation Licence at the entrance to the installation in the following languages – English, SeTshwana and Afrikaans.

b. The Licensee must provide to the NNR documented proof that the translations into SeTshwana and Afrikaans are true and accurate translations of the original English text.

PART B-1: SPECIFIED NNR REQUIREMENTS FOR INDUSTRIAL EFFLUENT TREATMENT FACILITY

B-1.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-1.2 The dose impact of liquid releases from the facility must be in compliance with the NNR approved annual authorised discharge quantities for the Pelindaba site.

B-1.3 Only Industrial Effluent complying with the following requirements may be accepted at the LETF:

i. Alpha < 10 Bq/litre.
ii. Beta < 40 Bq/litre.
iii. Tritium < 3E03 Bq/litre.

B-1.4 Necsa must implement a NNR approved programme/system to assure compliance to the dose limit as described in B-1.2 above.

B-1.5 Waste containers filled with sludge originating from industrial effluent that are not radioactively contaminated may be transferred to an authorised waste removal contractor.

B-1.6 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-1.7 No off-site transport of radioactive material or equipment may be undertaken by the facility without prior NNR approval.

B-1.8 Industrial effluent Release Tank IE8 may not be utilised for the receipt of treated effluent without prior NNR approval.

B-1.9 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

PART B-2: SPECIFIED NNR REQUIREMENTS FOR THE LOW ACTIVE EFFLUENT TREATMENT

B-2.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-2.2 The dose impact of liquid releases from the facility must be in compliance with the NNR approved annual authorised discharge quantities for the Pelindaba site.

B-2.3 Only Low Active Effluent complying with the following requirements may be accepted at the LETF:

i. Alpha < 100 Bq/litre.
ii. Beta < 4000 Bq/litre.
iii. Tritium < 3E05 Bq/litre.

B-2.4 Necsa must implement a NNR approved programme to assure compliance to the dose limit as described in B-2.2 above.

B-2.5 Waste containers filled with sludge originating from low active effluent that are not radioactively contaminated may be transferred to an authorised waste removal contractor.

B-2.6 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-2.7 No off-site transport of radioactive material or equipment may be undertaken by the facility without prior NNR approval.

B-2.8 Low Active effluent release tanks LA6 and LA7 may not be utilised for the receipt of treated effluent without prior NNR approval.

B-2.9 Low Active effluent may be released directly from Low Active effluent receiving tanks 46/1, 46/2 or 46/3 under the control of and subject to the conditions of a SHEQD concession.

B-2.10 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

PART B-3: SPECIFIED NNR REQUIREMENTS FOR MEDIUM ACTIVE EFFLUENT TREATMENT FACILITY

B-3.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-3.2 Medium Active Effluent is effluent complying with the following requirements:

i. Alpha $\geq$ 100 Bq/litre
ii. Beta $\geq$ 4000 Bq/litre
iii. Tritium $\geq$ 3E05 Bq/litre

B-3.3 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-3.4 No off-site transport of material or equipment may be undertaken by the facility without prior NNR approval.

B-3.5 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

PART B-4: SPECIFIED NNR REQUIREMENTS FOR THE SOLIDIFICATION FACILITY

B-4.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-4.2 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-4.3 No off-site transport of material or equipment may be undertaken by the facility without prior NNR approval.

B-4.4 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

PART B-5: SPECIFIED NNR REQUIREMENTS FOR LAUNDRY

B-5.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-5.2 White and active laundry items must be received and handled separately.

B-5.3 Active laundry items must be kept in plastic bags until emptied directly into the washing machine.

B-5.4 Active laundry items must be monitored after having been washed and dried.

B-5.5 After having been washed, active laundry items must be handled wearing protective gloves until the items have passed the release criteria.

B-5.6 Wash water from the laundry must be treated as low active liquid effluent.

B-5.7 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-5.8 No off-site transport of material or equipment may be undertaken by the facility without prior NNR approval.

B-5.9 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

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PART B-6: SPECIFIED NNR REQUIREMENTS FOR THE HOT YARD

B-6.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-6.2 **Hot Yard Interim Drum Storage Area**

i. A maximum of one thousand (1000) 210 litre waste containers may be stored in the Hot Yard Interim Drum Storage Area.

ii. Waste containers stored in the Hot Yard Interim Drum Storage Area may be stacked to a maximum of two (2) tiers high.

iii. Radiation levels at the fence surrounding the Hot Yard Interim Drum Storage Area may not exceed the levels specified for an uncontrolled radiological area.

B-6.3 **Flammable Liquid Store**

i. No radioactive material or radioactively contaminated material may be present in this store.

B-6.4 **Carboy Store**

i. A maximum of five hundred (500) carboys may be stored in the Carboy Store.

ii. A maximum of twenty four (24) 100 litre waste containers may be stored in the Carboy Store.

iii. The ^{235}U contents of waste containers stored in the Carboy Store may not exceed 200 grams per waste container.

B-6.5 **Molybdenum Decay Storage Area**

i. The approved Operational Technical Specification (OTS) for the Molybdenum Decay Storage Area is document NL27/NW-OTS-0006 (Rev A): *"Operating Technical Specifications for Handling, Temporary Storage and Preparation for disposal of LILW(I)-SL that could decay to LILW(L)-SL within 5 years"*.

ii. A maximum of two hundred and fifty (250) concrete decay containers may be stored in this storage area

B-6.6 **The Bunker**

i. No additional radioactive material or radioactively contaminated material may be stored in this bunker.

ii. Decommissioning of this area requires prior NNR approval which must be applied for under an Authorisation Change Request (ACR).

iii. A NNR approved care and maintenance programme must be maintained for this facility.

iv. A NNR approved inventory of material stored in the facility must be maintained.

B-6.7 **Solidification Drum Preparation Area**

i. No radioactive material or radioactively contaminated material may be present in this area.

B-6.8 **Solidification Drum Curing Area**

i. A maximum of twenty (20) solidified drums may be stored in the curing area at any time.

B-6.9 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-6.10 No off-site transport of material or equipment may be undertaken by the facility without prior NNR approval.

B-6.11 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

PART B-7: SPECIFIED NNR REQUIREMENTS FOR DECONTAMINATION HALL

B-7.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-7.1 **Filter Press**

i. The ^{235}U contents of filters received for drumming may not exceed 200 grams.

ii. The ^{235}U content of drummed filters may not exceed 200 grams per drum.

B-7.2 **Vapour Blaster**

i. Only radioactively contaminated tools and small equipment originating from The Liquid Effluent Treatment Facility in P-2400 may be decontaminated in the Vapour Blaster.

B-7.3 **Tent**

i. The Tent may not be utilised at all without prior NNR approval.

B-7.4 **Wash Bay**

i. Only radioactively contaminated equipment and tools originating from the Liquid Effluent Treatment Facility in Building P-2400 may be decontaminated in this facility.

B-7.5 Moly Waste Repacking Area

i. Only moly waste originating from the NTP processes may be repacked in this area.

B-7.6 **Hot Cell**

i. Decommissioning of this facility requires prior NNR approval which must be applied for under an Authorisation Change Request (ACR).

ii. The facility must maintain a NNR approved care and maintenance programme.

B-7.7 **Molybdenum Waste Transfer Station**

i. Phase 2 decommissioning is authorised to take place in the Molybdenum Waste Transfer Station in accordance with an NNR approved decommissioning strategy and plan

B-7.8 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-7.9 No off-site transport of material or equipment may be undertaken by the facility without prior NNR approval.

B-7.10 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

PART B-8: SPECIFIED NNR REQUIREMENTS FOR VOLUME REDUCTION FACILITY

B-8.1 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-8.2 Phase 2 decommissioning is authorised to take place in the Volume Reduction Facility in accordance with an NNR approved decommissioning strategy and plan.

B-8.3 Transfers of equipment and material from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorized to receive said equipment and material.

B-8.4 No off-site transport of material or equipment may be undertaken by the facility without prior NNR approval.

B-8.5 A schedule for the licensing and submission of all the relevant documentation of the LETF will be submitted to the NNR by no later than 30 November 2010.

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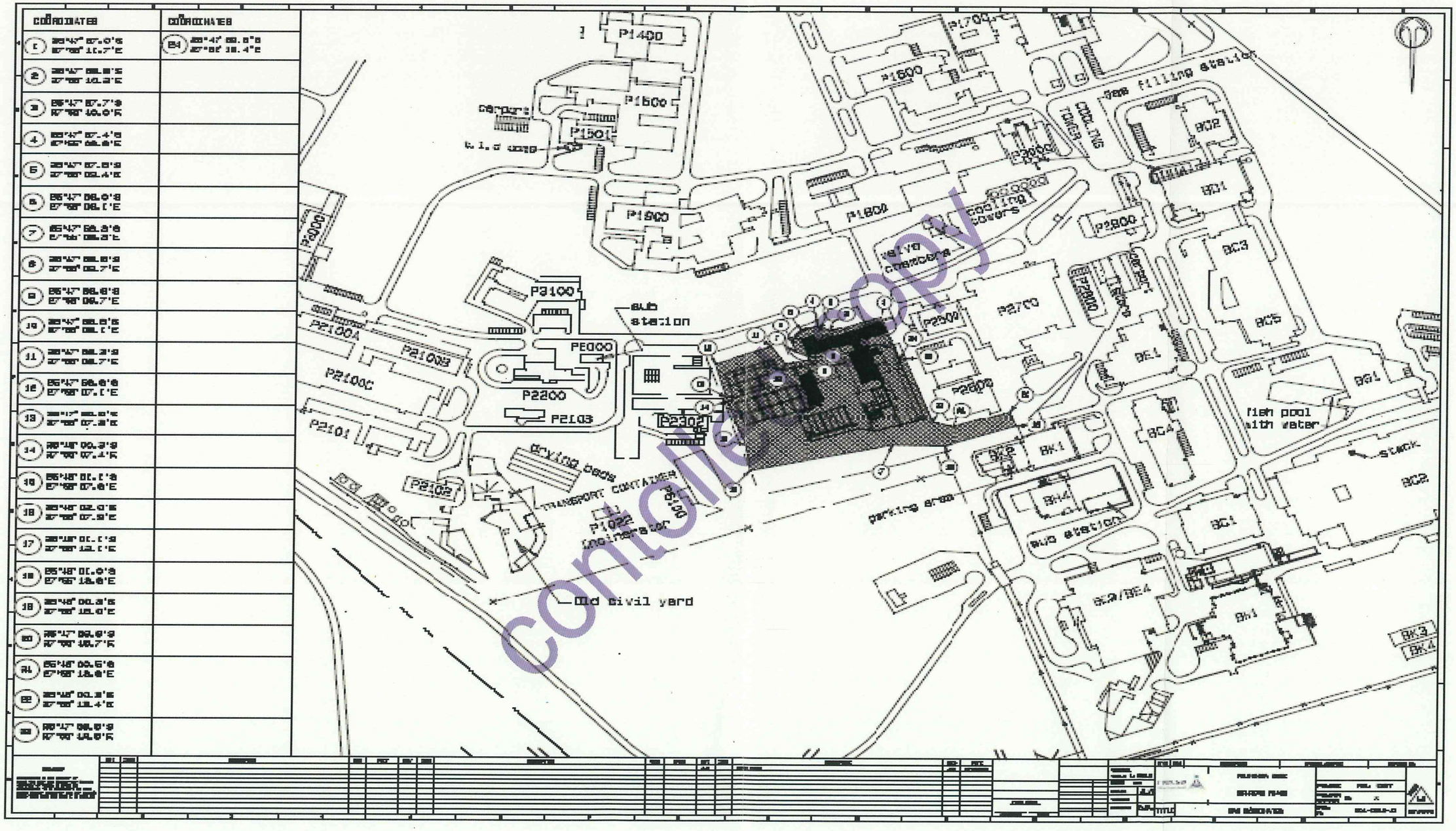

Figure 1: Location of Liquid Effluent Treatment Facility Complex on the Pelindaba site