

# **2004 Annual Inspection and Status Report for the Hallam Nuclear Power Facility, Hallam, Nebraska, Decontamination and Decommissioning Program Site**

## **Summary**

The Hallam Nuclear Power Facility (HNPF) was inspected on March 9, 2004. The intermediate heat exchanger (IHX) structure is in excellent condition. A grass-covered mound over the old reactor foundation is in good condition and damaged vegetation found last year has been restored. The covers on two flush-mounted wells are cracked and stuck. Other wells are in excellent condition, although some are in the traffic pattern of current operations and are a nuisance to the power plant operators. DOE will continue to maintain the grass over the buried reactor foundation. Owner representatives indicate the existing sprinkler system is old and requires high maintenance and labor to operate; they want to talk with DOE about upgrading the system. Ground water results indicate radionuclides have not leaked from the containment systems. There is no requirement for a follow-up inspection.

## **1.0 Introduction**

This report presents the findings of the annual U.S. Department of Energy (DOE) inspection of the HNPF at Hallam, Nebraska.

M. R. Widdop (Inspector) of S.M. Stoller Corporation, the DOE Legacy Management (LM) Contractor at Grand Junction, conducted the inspection on March 9, 2004. L. McGee of DOE-LM in Morgantown, WV, participated. Todd Chinn of the Nebraska Public Power District (NPPD) acted as an escort on NPPD property. The inspection was conducted in accordance with the *Long-Term Surveillance Plan [LTSP] for the Hallam Nuclear Power Facility, Hallam, Nebraska* (DOE Grand Junction, Colorado, September 1998), and procedures established by DOE for site inspections.

The purposes of the inspection were to confirm the integrity of the IHX structure and the grassed cover over the foundation of the former reactor building, examine the condition of DOE monitor wells, and meet with owner representatives.

## **2.0 Inspection Results**

Features discussed in this report are shown on the attached drawing. Photographs to support specific observations are identified in the text and on the drawing by photograph location (PL) numbers.

The HNPF site consists of :

1. The IHX cells, entombed in a waterproofed above-grade concrete structure.

2. A massive, below-grade, reinforced concrete structure, once the foundation of the reactor and now covered with a waterproof membrane, soil, and grass. Fixed radioactive materials remain at three principal locations within this structure.
3. Nineteen monitor wells.

Both structures and all wells are at the Sheldon Power Station, an active coal-fired power plant owned by the NPPD.

## **2.1 Intermediate Heat Exchanger**

The IHX is a massive block-like concrete sarcophagus, about 40 feet by 80 feet on a side, at the north end of the former HNPF (PL-1 and PL-2). On the south side, it is two stories (about 25- to 30-feet) high. On the north side, the structure is one-story high. The roof on the two-story part is slightly crowned; the roof on the one-story part is sloped to drain. Repairs to the roof and walls made in 2001 remain adequate. Inspectors noted a minor rust stain and cracks in the blue-painted cornice on the north side.

## **2.2 Buried Concrete Structure, Once the Foundation of the Former Reactor**

The old reactor foundation is buried beneath a waterproof membrane, soil, and grass. Today the buried structure appears as a low, flat-topped, grass-covered mound, 1.4 acres in extent, immediately south of the IHX. The grass is a well-established lawn, and generally is in good condition (PL-3). NPPD reseeded grass on the side slope of the northeast corner of the mound that appeared to have died as a result of last year's drought and it now looks healthy. Gravel found on the east side slope of the mound in 2003 was removed and the grass restored. Inspectors saw no evidence of recent erosion or other concerns.

NPPD staff reported that the sprinkler system on the grass cover was installed when the plant was decommissioned and requires a lot of maintenance to remain operational. Also, the system is completely manual and requires a lot of labor to operate. NPPD staff think the system should be replaced and automated. Contractor staff will research the closure agreements to determine if DOE is responsible for the cost of this work and will provide a recommendation to DOE.

## **2.3 Monitor Wells**

DOE monitors ground water at this site in response to a request from the Nebraska Department of Health.

There are 19 wells in the monitoring network. DOE monitors the wells annually. Water levels are measured in each well. Samples are collected at all wells that produce sufficient water. Flush mounted wells in high traffic areas (e.g., OBS 6A and OBS 6B) are covered with gravel and are difficult to locate. The covers on these wells were not removed during the 2003 sampling event because they are cracked and wedged tight with coal dust. The inspector obtained manufacturer information to replace the covers. If the regulator concurs that monitoring can be discontinued, DOE should not replace these covers. Otherwise, sampling crews should be prepared to replace the covers on the next sampling event.

During this and previous inspections, inspectors noted that many of the DOE wells are in or along traffic patterns associated with the current operation of the Sheldon Power Plant. In 2003, NPPD personnel inquired about the possibility of eliminating monitor wells OBS 2B and 2C because of their location in the work area. NPPD believes that it is just a matter of time until a piece of heavy equipment collides with this pair of wells.

Results of monitoring (last conducted in June 2003) show the concentration in ground water of five contaminants of potential concern (COPCs) is very low (detects may be counting statistic noise) and consistent from year to year. DOE has evaluated the monitoring results to determine if the present program is justified. Monitoring frequency, locations, analytes, constituent transport, radionuclide inventory, and isolation systems were considered in the evaluation. The evaluation concludes the monitoring has demonstrated that contaminants have not leaked from the containment and can safely be discontinued. DOE has agreed to monitor these wells through 2005. If requested, Stoller will work with the DOE site lead to facilitate contact with the regulator and request concurrence to discontinue ground water monitoring after the 2005 sampling event and decommission the wells.

### 3.0 Recommendations

1. Inspectors noted a minor rust stain and cracks in the blue-painted cornice on the north side of the IHX building (page 2).

**Recommendation:** Continue to monitor building condition.

2. The sprinkler system requires high maintenance and labor to operate; NPPD recommends that the system be upgraded (page 2).

**Recommendation:** Determine if DOE is responsible for maintenance of the grass-covered mound and respond to NPPD. Work with NPPD to find a way to upgrade the system.

3. The covers on two flush-mounted wells (OBS 6A and OBS 6B) are cracked and stuck (page 2).

**Recommendation:** If the regulator concurs that monitoring can be discontinued, DOE should not replace these covers. Otherwise, sampling crews should be prepared to replace the covers on the next sampling event.

4. Some of the wells in the monitoring network interfere with current power plant operations (page 3).

**Recommendation:** Stoller will work with DOE to determine if decommissioning of these wells is appropriate.

5. Ground water monitoring results indicate that contaminants have not leaked from the containment and an evaluation of results concludes that monitoring can be safely discontinued (page 3).

**Recommendation:** If requested, Stoller will work with the DOE site lead to facilitate contact with the regulator and request concurrence to discontinue ground water monitoring after the 2005 sampling event and decommission the wells.

## 4.0 Photographs

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<b>Photograph Location Number</b>	<b>Azimuth</b>	<b>Photograph Description</b>
PL-1	190	Intermediate Heat Exchanger containment building, north side and roof.
PL-2	45	Intermediate Heat Exchanger containment building, west and south sides.
PL-3	350	East side of grass-covered mound.

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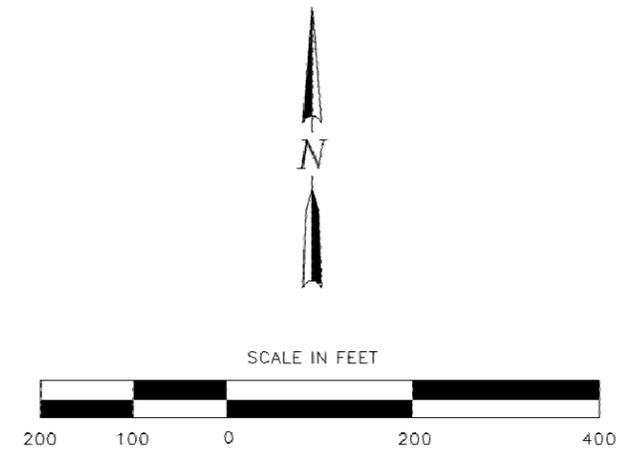
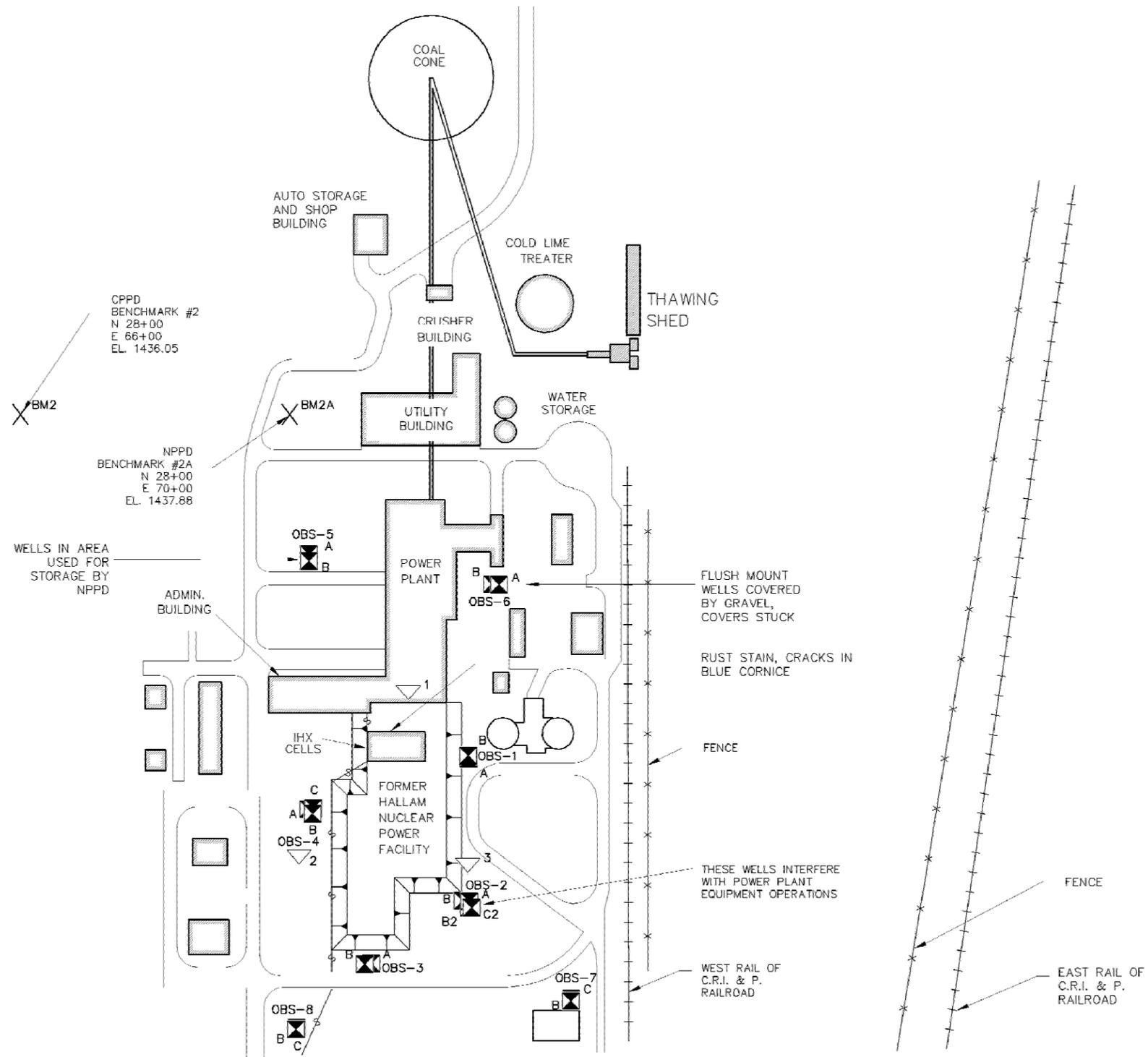
HAL 3/2004. PL-1. Intermediate Heat Exchanger containment building, north side and roof.



HAL 3/2004. PL-2. Intermediate Heat Exchanger containment building, west and south sides.



HAL 3/2004. PL-3. East side of grass-covered mound.



- EXPLANATION:**
- OBS-5 MONITOR WELL LOCATION  

A
B
 (A - SHALLOW WELL)  
 (B - DEEP WELL)  
 NOTE: 4C IS DEEPEST
  - BM2 BENCHMARK
  - IHX INTERMEDIATE HEAT EXCHANGER
  - CHAIN-LINK FENCE
  - 1 PHOTO LOCATION AND NUMBER

**NOTE:**  
 OBS-SERIES WELLS SURVEYED IN RELATION TO CPPD BENCHMARK #2 AND NPPD BENCHMARK #2A. OTHER BORINGS AND SITE FEATURES (BUILDINGS, ROADS, ETC.) ARE SCHEMATIC AND ARE NOT SHOWN IN RELATIONSHIP TO THE BENCHMARKS.

ANNUAL INSPECTION CONDUCTED  
 MARCH 9, 2004

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by <b>S.M. Stoller Corporation</b> Under DOE Contract No. DE-AC01-02GJ79491
2004 ANNUAL INSPECTION DRAWING HALLAM NUCLEAR POWER FACILITY HALLAM, NEBRASKA	
DATE PREPARED: APRIL 6, 2004	FILENAME: S0098000