FSO
Hersemann/AB
RH
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FSO
Scott
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FSO
Bollinger
MB
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FSO
Weis
MJW
1/22/14

JAN 22 2014

Ms. Victoria A. White
Chief Operating Officer
Fermilab
P.O. Box 500
Batavia, IL 60510

Dear Ms. White:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT DETERMINATION AT FERMI NATIONAL ACCELERATOR LABORATORY – COLLIDER DETECTOR AT FERMILAB REPURPOSING

Reference: Letter, from V. White to M. Weis, dated January 14, 2014, Subject: National Environmental Policy Act Environmental Evaluation Notification Form for Collider Detector at Fermilab Repurposing

I have reviewed the National Environmental Policy Act (NEPA) Environmental Evaluation Notification Form (EENF) for the Collider Detector at Fermilab (CDF) Repurposing. Based on the information provided in the EENF, I have approved the following categorical exclusion (CX):

Project Name	Approved	CX
CDF Repurposing	1/21/2014	B1.15, B2.1

I am returning a signed copy of the EENF for your records. No further NEPA review is required. This project falls under categorical exclusions provided in 10 *CFR* 1021, as amended in November 2011.

Sincerely,

Michael J. Weis
Site Manager

Enclosure:
As Stated

cc: N. Lockyer, w/o encl.
M. Michels, w/encl.
A. Kenney, w/o encl.
T. Dykhuis, w/encl.

bc: J. Scott, w/o encl.
R. Hersemann, w/encl.

S: CX- CDF Repurposing 012114.rh

File:

FERMILAB ENVIRONMENTAL EVALUATION NOTIFICATION FORM (EENF) for documenting compliance with the National Environmental Policy Act (NEPA), DOE NEPA Implementing Regulations, and the DOE NEPA Compliance Program of DOE Order 451.1B

Project/Activity Title: Collider Detector at Fermilab (CDF) Repurposing
ES&H Tracking Number: 01115

I hereby verify, via my signature, the accuracy of information in the area of my contribution for this document and that every effort would be made throughout this action to comply with the commitments made in this document and to pursue cost-effective pollution prevention opportunities. Pollution prevention (source reduction and other practices that eliminate or reduce the creation of pollutants) is recognized as a good business practice which would enhance site operations thereby enabling Fermilab to accomplish its mission, achieve environmental compliance, reduce risks to health and the environment, and prevent or minimize future Department of Energy (DOE) legacy wastes.

Fermilab Action Owner: Jonathan Lewis (X3779)
Signature and Date 1/14/14

Fermilab ES&H Officer: Angela Aparicio (X3701)
Signature and Date Angela Aparicio 1/14/14

I. Description of the Proposed Action and Need

Purpose and Need:
The purpose of the proposed action is to clean out the Fermilab Collider Detector at Fermilab (CDF) for the purpose of preparing the facility for new activities, now that the Tevatron run has concluded. The CDF central detector would be stripped to allow for it to be used in future fixed-target experiments. Similarly, the experimental hall would be cleared of CDF equipment that does not have potential use for future experiments. All CDF equipment would be removed from the counting rooms, office areas, and assembly hall so that these could be used in the future for the Illinois Accelerator Research Center.

Proposed Action:
All flammable gas and cryogenic lines would be purged and connections to each would be isolated. Halon extinguishing systems would be removed from the counting rooms, electronics would be recycled or reused, refrigerants would be recovered from all abandoned systems, and chilled water systems would be drained and dried. In addition, all equipment and spare parts, related to the operation of the CDF would be evaluated for the potential future reuse. Some items would be transferred to other efforts, some would be stored, and those with a low probability for reuse would be disposed. The counting rooms on the first, second, and third floors would be cleared out. Some portion of the equipment from the trigger and control areas of the second floor counting room would be put in storage to be used in a potential future display.

The CDF central detector would be moved to the collision hall where it would be stripped of all electronics, cables, and other equipment; all photomultiplier tubes would be recovered for potential future use; and other equipment may be recovered, if there is a foreseeable use for it. The electronics racks and their associated power distribution and cooling water pipes would remain intact for future experimental use; the plugs would be set on stands and completely stripped; the electromagnetic sections would be scrapped; and phototubes would be saved. Once the plugs were removed, the silicon vertex detector intermediate silicon layers and central outer trackers would be removed followed by the time of flight cylinder, which contains 216 scintillator bars with a photomultiplier tube at each end (actual size is 4x4x280 centimeters. Finally, the cable-carrier bridge would be removed to increase crane coverage of the deep pit.

All of the outer muon systems would be dismantled. For the muon walls and torroids, the scintillators and chambers would be removed and the steel would be cut apart into the constituent blocks. The blocks would be moved to the railhead for storage until future use as shielding. The scintillators and phototubes would be evaluated for use by other experiments and reused or saved, as appropriate.

In the collision hall, the shielding around the low-beta quadrupole magnets, the magnets themselves and their support structures would be removed. Additionally, all abandoned cables would be removed and electrical equipment for 400Hz power would be scrapped. When this work was completed, the plugs would be replaced on the central detector and it would be returned to the collision hall.

Throughout the dismantling task, every effort would be made to identify equipment for reuse. It is expected that phototubes; scintillators; cables; gas equipment such as valves, flow meters, long pipe sections; electrical equipment; general-purpose electronics; and large steel blocks for shielding would be reused and other metals, electronics, and cables would be recycled. Plastic scintillator that is not saved for reuse would also be recycled. The only part of the removed equipment that is expected to be sent to a landfill is the optical cables. This would be a small fraction of the total amount of material that would be removed.

Alternatives Considered:
Two alternatives were considered. The first was the complete demolition of the CDF. This would allow the building to be used in its entirety for new activities. However, the estimated cost of 26 million dollars was deemed too great. Also, this alternative would not allow for the possible reuse of experimental facilities having a 10 million dollar replacement value. A second alternative was to keep the experiment and second-floor counting room intact for use in an educational display for visitors to the laboratory, primarily school groups. This had the advantage of the potential for providing a unique educational experience; however, because plans for IARC include mounting experiments in the deep pit, it would not be possible to roll out the CDF detector at a later date. Therefore, the display alternative would not allow the reuse of the solenoid and collision hall for future experimental efforts.

II. Description of the Affected Environment

See section VI of this EENF.

III. Potential Environmental Effects (If the answer to the questions below is "yes", provide comments for each checked item and where clarification is necessary.)

A. Sensitive Resources: Would the proposed action result in changes and/or disturbances to any of the following resources?

- ☐ Threatened or endangered species
- ☐ Other protected species
- ☐ Wetland/Floodplains
- ☐ Archaeological or historical resources
- ☐ Non-attainment areas

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated substances or activities?

- ☐ Clearing or Excavation
- ☐ Demolition or decommissioning
- ☐ Asbestos removal
- ☐ PCBs
- ☐ Chemical use or storage
- ☐ Pesticides
- ☐ Air emissions
- ☐ Liquid effluents

☐ Underground storage tanks
☒ Hazardous or other regulated waste (including radioactive or mixed)
☒ Radioactive exposures or radioactive emissions
☐ Radioactivation of soil or groundwater

C. Other Relevant Disclosures: Would the proposed action involve any of the following actions/disclosures?

☐ Threatened violation of ES&H permit requirements
☐ Siting/construction/major modification of waste recovery or TSD facilities
☐ Disturbance of pre-existing contamination
☐ New or modified permits
☐ Public controversy
☐ Action/involvement of another federal agency
☐ Public utilities/services
☐ Depletion of a non-renewable resource

IV. Comments on checked items in section III.

Hazardous or other regulated waste (including radioactive or mixed)
Throughout the dismantling task, every effort would be made to identify equipment for reuse. It is expected that phototubes; scintillators; cables; gas equipment such as valves, flow meters, long pipe sections; electrical equipment; general-purpose electronics; and large steel blocks for shielding would be reused and other metals, electronics, and cables would be recycled. Plastic scintillator that is not saved for reuse would also be recycled. The only part of the removed equipment that is expected to be sent to a landfill is the optical cables. This would be a small fraction of the total amount of material that would be removed.

Experimental components, such as tracking detectors, beam pipe, and possible phototubes that may cannot be recycled or reused would be handled and disposed according to the Fermilab Radiological Control Manual.

Radioactive exposures or radioactive emissions
All work to be performed would be reviewed and all materials removed would be surveyed following procedures dictated in the Fermilab Radiological Control Manual.

V. NEPA Recommendation

Fermilab staff has reviewed this proposed action and believe a Categorical Exclusion is appropriate. It is believed that the proposed action meets the description found in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B1.15 – *Support buildings;* B2.1 – *Workplace enhancements;* and B2.5 – *Facility safety and environmental improvements* - which states:

B1.15 "Siting, construction or modification, and operation of support buildings and support structures (including, but not limited to, trailers and prefabricated and modular buildings) within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible). Covered support buildings and structures include, but are not limited to, those for office purposes; parking; cafeteria services; education and training; visitor reception; computer and data processing services; health services or recreation activities; routine maintenance activities; storage of supplies and equipment for administrative services and routine maintenance activities; security (such as security posts); fire protection; small-scale fabrication (such as machine shop activities), assembly, and testing of non-nuclear equipment or components; and similar support purposes, but exclude facilities for nuclear weapons activities and waste storage activities, such as activities covered in B1.10, B1.29, B1.35, B2.6, B6.2, B6.4, B6.5, B6.6, and B6.10 of this appendix."

B2.1 "Modifications within or contiguous to an existing structure, in a previously disturbed or developed area, to enhance workplace habitability (including, but not limited to, installation or improvements to

lighting, radiation shielding, or heating/ventilation/air conditioning and its instrumentation, and noise reduction)."

B2.5 "Safety and environmental improvements of a facility (including, but not limited to, replacement and upgrade of facility components) that do not result in a significant change in the expected useful life, design capacity, or function of the facility and during which operations may be suspended and then resumed. Improvements include, but are not limited to, replacement/upgrade of control valves, in-core monitoring devices, facility air filtration systems, or substation transformers or capacitors; addition of structural bracing to meet earthquake standards and/or sustain high wind loading; and replacement of aboveground or belowground tanks and related piping, provided that there is no evidence of leakage, based on testing in accordance with applicable requirements (such as 40 CFR part 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" and 40 CFR part 280, "Technical Standards and Corrective Action Requirements for Owners and Operators or Underground Storage Tanks"). These actions do not include rebuilding or modifying substantial portions of a facility (such as replacing a reactor vessel)."

Fermilab NEPA Program Manager: Teri L. Dykhuis
Signature and Date Teri L Dykhuis 1/14/2014

VI. DOE/FSO NEPA Coordinator Review

Concurrence with the recommendation for determination:

Fermi Site Office (FSO) Manager: Michael J. Weis
Signature and Date 1/22/2014

FSO NEPA Coordinator: Rick Hersemann
Signature and Date Rick Hersemann 1/21/2014