

PROGRAMMATIC AGREEMENT
AMONG THE
UNITED STATES DEPARTMENT OF ENERGY,
ADVISORY COUNCIL ON HISTORIC PRESERVATION,
SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY,
AND THE
SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICER,
REGARDING CONSTRUCTION AND OPERATION OF THE
LONG-BASELINE NEUTRINO FACILITY AND
DEEP UNDERGROUND NEUTRINO EXPERIMENT

WHEREAS, the United States Department of Energy (DOE) proposes to fund the Long Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (LBNF/DUNE),¹ pursuant to the FY 2012-2015 Energy and Water Development and Related Agencies Appropriations Acts and the associated Congressional Budget Project Data Sheets; and

WHEREAS, the Undertaking consists of the construction and operation of the LBNF/DUNE located at the Sanford Underground Research Facility (SURF or Sanford Lab), as described in the purpose and project description provided in Appendix A-1; and

WHEREAS, DOE defines the Undertaking's Area of Potential Effect (APE) as illustrated in Appendix A-2; and

WHEREAS, DOE is partnering on the Undertaking with the South Dakota Science and Technology Authority (SDSTA), a state-chartered entity created to foster scientific and technological investigations, experimentation, and development in South Dakota that operates the SURF; and

¹ Other names for LBNF/DUNE have been used, including "Long Baseline Neutrino Experiment" and "Long Baseline Neutrino Facility and Experiment."

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WHEREAS, consultation with the Illinois State Historic Preservation Officer pursuant to Section 106 of the National Historic Preservation Act (NHPA) has been concluded for those components of LBNF/DUNE located at the Fermi National Accelerator Laboratory (Fermilab) in Batavia, Illinois; and

WHEREAS, DOE determined in consultation with the South Dakota State Historic Preservation Officer (SDSHPO) that the effects of the Undertaking on historic properties cannot be fully determined prior to approval of the Undertaking and that the development of a Programmatic Agreement (PA) in accordance with 36 CFR Part 800.14(b) will provide a clear path forward; and

WHEREAS, DOE consulted with Cheyenne River Sioux Tribe, Crow Creek Sioux Tribe, Flandreau Santee Sioux Tribe, Lower Brule Sioux, Sisseton-Wahpeton Oyate, Standing Rock Sioux Tribe, Yankton Sioux Tribe, Spirit Lake Sioux Tribe, Three Affiliated Tribes, Turtle Mountain Band of Chippewa Indians, Winnebago Tribe of Nebraska, Santee Sioux Nation, Northern Arapahoe Tribe, Eastern Shoshone Tribe, Northern Cheyenne Tribe, Fort Peck Assiniboine and Sioux, Rosebud Sioux Tribe, Oglala Sioux Tribe, and the Crow Tribe (American Indian Tribes, hereinafter), as the Undertaking is located within the Black Hills which are known to have religious and cultural significance to American Indian Tribes; and

WHEREAS, DOE has consulted with the City of Lead (Lead), portions of which are part of Sanford Lab and within the National Register of Historic Places (NRHP) district for historical significance related to architecture, community development, and mining for the period of 1880 to 1948, and which is located within or near the APE, see Appendix A-2; and

WHEREAS, DOE has consulted with the City of Deadwood (Deadwood), through which the Mickelson Trail runs, a portion of which may be affected by the Undertaking; and

WHEREAS, DOE has consulted with the South Dakota Game, Fish and Parks (SDGFP), which has management responsibilities over the Mickelson Trail, a portion of which may be affected by the Undertaking ; and

WHEREAS, DOE's Fermi Site Office is the lead DOE organization on the PA and has coordinated with other DOE organizations with interests in the Undertaking, including Fermi National Accelerator Laboratory (Fermi Research Alliance, LLC), Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, and their respective DOE Site Offices; and

WHEREAS, DOE has invited American Indian Tribes, Lead, Deadwood, and SDGFP to participate in the development of the PA and be Signatories or Concurring Parties to it; and

WHEREAS, DOE and SDSTA have provided regular means of involvement to Consulting Parties and the public regarding the Undertaking through numerous public and private meetings, school programs, oral conversations, written correspondence, and through

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coordination of the NHPA and National Environmental Policy Act (NEPA) compliance processes; and

WHEREAS, by letter dated February 25, 2015, DOE notified the Advisory Council on Historic Preservation (ACHP) of its intention to develop a PA and the ACHP has determined that it will be a signatory to this agreement; and

NOW, THEREFORE, DOE, ACHP, SDSTA, SDSHPO, Lead, Deadwood, and SDGFP agree that the execution and implementation of this PA in accordance with the following stipulations satisfies DOE's responsibilities under Section 106 of the NHPA.

STIPULATIONS

DOE shall ensure that the following measures are carried out:

1. DOE Authorization to SDSTA

DOE authorizes SDSTA to carry out the terms of this PA except where DOE's responsibilities are specified in the PA. SDSTA will maintain records of its actions to implement the PA, such as project documentation and minutes of meetings. SDSTA will prepare an annual report for DOE and Consulting Parties on its PA-related activities and submit the report electronically or by mail. DOE remains legally responsible for all findings and determinations.

2. Standards, Definitions, and Qualifications

A. Standards and Definitions

Terms used in this PA are defined in 36 Code of Federal Regulations (CFR) Part 800. In addition, the standards and guidance identified in Appendix B are applicable to this PA.

B. Qualifications

All cultural resource work carried out under this PA will be performed by qualified professionals (e.g., architect, historian, architectural historian, archaeologist, historical architect) who at a minimum meet the *Secretary of the Interior's Professional Qualification Standards* (48 Federal Register (FR) 44716, September 26, 1983) and have experience relevant to the type of historic resources being investigated and type of cultural resources investigation.

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3. American Indian Tribes

The American Indian Tribes are Consulting Parties to the NHPA Section 106 process, and have a continuing role in the implementation of the PA.

A. SDSTA consciously seeks additional opportunities for outreach to American Indian Tribes, and hence, in 2009, SDSTA created a fully chartered Cultural Advisory Committee, whose membership is diverse and currently includes members from four Tribes. The role of the Committee is to ensure SURF operates in a way that is sensitive to the diverse cultures represented in Lead, across the State of South Dakota and the surrounding region. SDSTA will maintain the Committee whose responsibilities include:

- Advise key stakeholders, including, but not limited to, the SDSTA Board of Directors, Sanford Lab staff, DOE, and members of scientific collaborations concerning the importance of science education to the region's diverse cultures.
- Meet quarterly to recommend and implement initiatives that support the facility's commitment to promoting science education to South Dakota tribal students and teachers. This is performed through various programs as Star Base Nova (administered through the South Dakota National Guard); providing science curriculum and teacher training to tribal students; participation in Science Technology Engineering and Math (STEM) opportunities by offering internships, site field trips, and video conferences to tribal students and teachers with world class scientists.
- Encourage SDSTA and Sanford Lab management to actively integrate regional cultures into their designs, procedures and operations. This is performed by highlighting a respect for the land, water and air. This is implemented by meeting and exceeding permit and regulatory requirements and practicing sustainability through recycling, energy and water conservation, and minimizing SURF's disturbance footprint.

B. DOE recognizes the government-to-government relationship between the U.S. Government and each American Indian Tribe. The Tribes and/or DOE may request government-to-government engagement pursuant to Executive Order 13175— Consultation and Coordination with Indian Tribal Governments, *November 6, 2000*, and the NHPA.

4. Identification and Evaluation, and Application of Criteria of Adverse Effect—Survey-Level Documentation

Documentation will be prepared by a qualified professional in consultation with SDSTA and DOE, consisting of the South Dakota State Historical Society Section 106 Project Review Form, which includes the following:

- 1.) historic and current photographs of the Complex and each building and structure or component within it (consistent with Appendix E);

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- 2.) a site plan(s) of the Complex;
- 3.) a SDSHPO Intensive Historic Site Survey Form, or other required form in consultation with the SDSHPO, for each building or structure or component that makes up the Complex;
- 4.) an evaluation whether the subject property contributes to the Lead Historic District or is otherwise listed or eligible for listing on the NRHP;
- 5.) a description of the proposed activity, including disturbance and modifications; and
- 6.) a determination of effect (in accordance with 36 CFR 800.5) which would include identifying areas that have the potential to contain intact subsurface deposits and features.

5. Project Review and Consultation

A. Excluded List

Projects and activities meeting the Excluded List in Appendix C do not require any review or consultation under 36 CFR Part 800 or this PA. This list may be amended by any Signatory with consent from the other Signatories. The amendment process will be carried out with a Signatory notifying (by e-mail or by letter) all other Signatories of the proposed amendment (change) and requesting their concurrence. All Signatories must agree to the change in writing (by e-mail or letter) before the amendment can go into effect. Other projects and activities not meeting the Excluded List would be reviewed per Stipulation 5.B. below.

B. Project Review

Project reviews will follow the standard process outlined in 36 CFR Part 800.3-800.5. A Project description and effect determination will be sent to the Consulting Parties who will be provided 45 calendar days to review the proposed project.

- i. No Historic Properties Affected or No Adverse Effect Determination: If no comments are received within 45 days the SDSTA will implement the project. If comments are received SDSTA will consult with commenter and resolve the issues.
- ii. Resolution of Adverse Effect: See Stipulation 6.

6. Mitigation of Adverse Effects

This PA will follow 36 CFR 800.6 for how adverse effects will be resolved. Adverse effect determinations and agreed upon Treatment Measures (e.g. avoid, minimize or mitigate) will be documented in a letter, rather than a Memorandum of Agreement, to the

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Signatories. Appendix E, The Preferred Treatment Measures for an Adverse Effect Determination, will be the standard Treatment Mitigation measure(s). If there are no objections within 30-days of the receipt of the Treatment Measure Letter, SDSTA will implement the project using the agreed upon Treatment Measures. If Treatment Measures cannot be agreed upon, SDSTA will inform DOE per Stipulation 9.

7. Historic Preservation Training

SDSTA will receive regular (at least once every two years) Historic Preservation Training provided by or in conjunction with SDSHPO. DOE, American Indian Tribes, and the other Consulting Parties will be invited to participate or provide necessary training. SDSTA will initiate discussions regarding dates, times, and locations when needs are identified. Topics may include application of *The Secretary of Interior's Standards for Rehabilitation*, appropriate methods of maintenance and preservation of historic buildings at the SURF, guidance literature with technical information (Preservation Bulletins and Preservation Briefs, etc.), and other topics. Historic Preservation Training will be documented in Annual Reports per Stipulation 1.

8. Discovery During Undertaking Implementation

A. Inadvertent Discovery of Human Remains

- 1.) In the event of an inadvertent discovery of human remains or funerary objects on state or private lands, the procedures set out in Appendix D will be followed pursuant to South Dakota Codified Law Chapter 34-27-25, 34-27-28, 34-27-31.
- 2.) For inadvertent discovery of human remains or funerary objects on federal land, SDSTA and DOE or the Land Management Agency affected will follow the Native American Graves Protection and Repatriation Act (NAGPRA).

B. Inadvertent Discovery of Other Cultural Resources

If undiscovered *cultural resources* are discovered during construction activities, construction activities will cease in the area of the discovery and a buffer zone will be established. SDSTA shall notify DOE immediately of the discovery and a qualified professional will evaluate the property for NRHP eligibility. Once the property is assessed, SDSTA, in consultation with DOE, shall notify the Consulting Parties. The notification shall describe SDSTA's assessment of the property's NRHP eligibility and actions it proposes to take to resolve the adverse effects based on the qualified professional's assessment. Those notified shall be afforded three working days from the notification to respond. SDSTA shall take into account recommendations provided by

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the Consulting Parties, and then carry out appropriate actions. SDSTA shall provide a report of their actions to the Consulting Parties when they are completed.

Isolated objects such as tools, insulators, bolts, nuts, sheet metal, and general trash will be collected by SDSTA or its designee. SDSTA will collect these objects and determine if they are unique and of any historical values that enhance the history of the Homestake Mine. Unique and valued artifacts will be provided to the Homestake Visitor Center or to the Homestake-Adams Research Museum in Deadwood.

9. Dispute Resolution

Should any Signatory object at any time to any actions proposed or the manner in which the terms of this PA are implemented, it should inform SDSTA and DOE. DOE, in consultation with SDSTA, will consult with the party to resolve the objection. If DOE determines that such objection cannot be resolved, DOE will:

- A. Forward all documentation reasonably relevant to the dispute, including DOE's proposed resolution, to the ACHP. The ACHP, at its discretion, will provide DOE with its advice on the resolution of the objection within thirty (30) days of receiving reasonably adequate documentation. Before reaching a final decision on the dispute, DOE will prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP and other Signatories. Consulting Parties will receive a copy of this written response. DOE will then proceed according to its final decision.
- B. If the ACHP does not provide its input regarding the dispute within the thirty (30) day time period, DOE may make a final decision on the dispute and proceed accordingly. Before reaching such a final decision, DOE will prepare a written response that takes into account any timely comments regarding the dispute from the Signatories and other Consulting Parties to the PA, and provide them and the ACHP with a copy of such written response.
- C. DOE's responsibilities to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

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10. Effective Date and Duration

The terms of this PA will become effective upon the date of the last signature by the Signatories. It will remain effective for the life of the Undertaking, which is 20 years, unless amended or terminated.

11. PA Review

The Signatories will independently review this PA every year prior to the first quarter meeting, where continued adequacy will be discussed.

12. Amendment

The PA will be amended when such an amendment is agreed to in writing by the Signatories. The amendment will be effective on the date a copy signed by all the Signatories and filed with the ACHP.

13. Termination

- A. If any Signatory to this PA determines that its terms will not or cannot be carried out, that party will immediately consult with the other parties in attempt to develop an amendment. If within thirty (30) days (or another time period agreed to by the other Signatories) an amendment cannot be reached, the objecting Signatory may terminate the PA upon written notification to the other Signatories.
- B. Once the PA is terminated, and prior to work continuing on the Undertaking, DOE will either (a) execute another PA pursuant to 36 CFR § 800.6 or 800.14(b), or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. DOE will notify the Signatories as to the course of action it will pursue.

14. Anti-Deficiency Act

Nothing herein will be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Sec. 1341. This PA is neither a fiscal nor a funds obligation document. Nothing in this PA authorizes or obligates DOE to expend, exchange, or reimburse funds, services or supplies, or to transfer or receive anything of value.

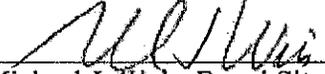
15. Availability of Funds

DOE obligations are subject to funds appropriated by the Congress of the United States for this purpose.

LBNF/DUNE PROGRAMMATIC AGREEMENT

SIGNATORIES

U.S. DEPARTMENT OF ENERGY



Michael J. Weis, Fermi Site Office Manager

Date: 9/23/2015

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

Jay D. Vogt, State Historic Preservation Officer

Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

John M. Fowler, Executive Director

Date: _____

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

Mike Headley, Executive Director

Date: _____

INVITED SIGNATORIES

CITY OF LEAD, SOUTH DAKOTA

Gerald F. Apa, Mayor

Date: _____

CITY OF DEADWOOD, SOUTH DAKOTA

Chuck Turbiville, Mayor

Date: _____

SOUTH DAKOTA GAME, FISH AND PARKS

Kelly Hepler, Secretary

Date: _____

LBNF/DUNE PROGRAMMATIC AGREEMENT

SIGNATORIES

U.S. DEPARTMENT OF ENERGY

Michael J. Weis, Fermi Site Office Manager Date: _____

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

Jay D. Vogt
Jay D. Vogt, State Historic Preservation Officer Date: 09-21-2015

ADVISORY COUNCIL ON HISTORIC PRESERVATION

John M. Fowler, Executive Director Date: _____

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

Mike Headley, Executive Director Date: _____

INVITED SIGNATORIES

CITY OF LEAD, SOUTH DAKOTA

Gerald F. Apa, Mayor Date: _____

CITY OF DEADWOOD, SOUTH DAKOTA

Chuck Turbiville, Mayor Date: _____

SOUTH DAKOTA GAME, FISH AND PARKS

Kelly Hepler, Secretary Date: _____

LBNF/DUNE PROGRAMMATIC AGREEMENT

SIGNATORIES

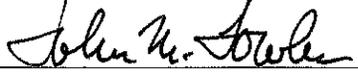
U.S. DEPARTMENT OF ENERGY

_____ Date: _____
Michael J. Weis, Fermi Site Office Manager

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

_____ Date: _____
Jay D. Vogt, State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

 _____ Date: 10/9/15
John M. Fowler, Executive Director

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

_____ Date: _____
Mike Headley, Executive Director

INVITED SIGNATORIES

CITY OF LEAD, SOUTH DAKOTA

_____ Date: _____
Gerald F. Apa, Mayor

CITY OF DEADWOOD, SOUTH DAKOTA

_____ Date: _____
Chuck Turbiville, Mayor

SOUTH DAKOTA GAME, FISH AND PARKS

_____ Date: _____
Kelly Hepler, Secretary

LBNF/DUNE PROGRAMMATIC AGREEMENT

1 **SIGNATORIES**

2

3 **U.S. DEPARTMENT OF ENERGY**

4 _____ Date: _____

5 Michael J. Weis, Site Manager, Fermi Site Office

6

7 **SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE**

8 _____ Date: _____

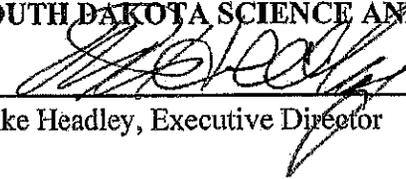
9 Jay D. Vogt, State Historic Preservation Officer

10 **ADVISORY COUNCIL ON HISTORIC PRESERVATION**

11 _____ Date: _____

12 John M. Fowler, Executive Director

13 **SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY**

14  _____ Date: 9-22-15

15 Mike Headley, Executive Director

16

17 **INVITED SIGNATORIES**

18

19 **CITY OF LEAD, SOUTH DAKOTA**

20 _____ Date: _____

21 Gerald F. Apa, Mayor

22 **CITY OF DEADWOOD, SOUTH DAKOTA**

23 _____ Date: _____

24 Chuck Turbiville, Mayor

25 **SOUTH DAKOTA GAME, FISH AND PARKS**

26 _____ Date: _____

27 Kelly Hepler, Secretary

28

LBNF/DUNE PROGRAMMATIC AGREEMENT

SIGNATORIES

U.S. DEPARTMENT OF ENERGY

_____ Date: _____
Michael J. Weis, Fermi Site Office Manager

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

_____ Date: _____
Jay D. Vogt, State Historic Preservation Officer

ADVISORY COUNCIL ON HISTORIC PRESERVATION

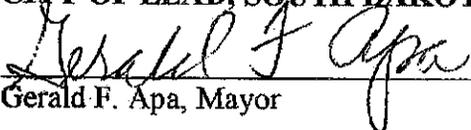
_____ Date: _____
John M. Fowler, Executive Director

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

_____ Date: _____
Mike Headley, Executive Director

INVITED SIGNATORIES

CITY OF LEAD, SOUTH DAKOTA

 _____ Date: 9-16-15
Gerald F. Apa, Mayor

CITY OF DEADWOOD, SOUTH DAKOTA

_____ Date: _____
Chuck Turbiville, Mayor

SOUTH DAKOTA GAME, FISH AND PARKS

_____ Date: _____
Kelly Hepler, Secretary

LBNE/DUNE PROGRAMMATIC AGREEMENT

SIGNATORIES

U.S. DEPARTMENT OF ENERGY

Michael J. Weis, Fermi Site Office Manager Date: _____

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

Jay D. Vogt, State Historic Preservation Officer Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

John M. Fowler, Executive Director Date: _____

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

Mike Headley, Executive Director Date: _____

INVITED SIGNATORIES

CITY OF LEAD, SOUTH DAKOTA

Gerald F. Apa, Mayor Date: _____

CITY OF DEADWOOD, SOUTH DAKOTA

Chuck Turbiville

Chuck Turbiville, Mayor Date: *9-22-15*

SOUTH DAKOTA GAME, FISH AND PARKS

Kelly Hepler, Secretary Date: _____

LBNF/DUNE PROGRAMMATIC AGREEMENT

SIGNATORIES

U.S. DEPARTMENT OF ENERGY

Michael J. Weis, Fermi Site Office Manager

Date: _____

SOUTH DAKOTA STATE HISTORIC PRESERVATION OFFICE

Jay D. Vogt, State Historic Preservation Officer

Date: _____

ADVISORY COUNCIL ON HISTORIC PRESERVATION

John M. Fowler, Executive Director

Date: _____

SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY

Mike Headley, Executive Director

Date: _____

INVITED SIGNATORIES

CITY OF LEAD, SOUTH DAKOTA

Gerald F. Apa, Mayor

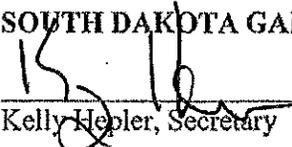
Date: _____

CITY OF DEADWOOD, SOUTH DAKOTA

Chuck Turbiville, Mayor

Date: _____

SOUTH DAKOTA GAME, FISH AND PARKS



Kelly Hepler, Secretary

Date: 9/30/15

LBNF/DUNE PROGRAMMATIC AGREEMENT

CONCURRING PARTIES

FERMI RESEARCH ALLIANCE, LLC

_____ Date: _____
Nigel Lockyer, President

U.S. DEPARTMENT OF ENERGY, BERKELEY SITE OFFICE

_____ Date: _____
Paul Golan, Acting Site Manager

U.S. DEPARTMENT OF ENERGY, OAK RIDGE NATIONAL LABORATORY SITE OFFICE

_____ Date: _____
Johnny O. Moore, Site Manager

CHEYENNE RIVER SIOUX TRIBE

_____ Date: _____
Harold Frazier, Chairman

CROW CREEK SIOUX TRIBE

_____ Date: _____
Roxanne Sazue, Chairwoman

FLANDREAU SANTEE SIOUX TRIBE

_____ Date: _____
Anthony Reider, President

LOWER BRULE SIOUX

_____ Date: _____
Gerald Jandreau, Acting Chairman

LBNE/DUNE PROGRAMMATIC AGREEMENT

SISSETON-WAHPETON OYATE

_____ Date: _____
Duane "Bruce" Renville, Chairman

STANDING ROCK SIOUX TRIBE

_____ Date: _____
Dave Archambault II, Chairman

YANKTON SIOUX TRIBE

_____ Date: _____
Robert Flying Hawk, Chairman

SPIRIT LAKE SIOUX TRIBE

_____ Date: _____
Myra Pearson, Chairwoman

THREE AFFILIATED TRIBES

_____ Date: _____
Mark Fox, Chairman

TURTLE MOUNTAIN BAND OF CHIPPEWA INDIANS

_____ Date: _____
Richard McCloud, Chairman

WINNEBAGO TRIBE OF NEBRASKA

_____ Date: _____
Darla LaPointe, Acting Chairman

SANTEE SIOUX NATION

_____ Date: _____
Roger Trudell, Chairman

LBNF/DUNE PROGRAMMATIC AGREEMENT

NORTHERN ARAPAHOE TRIBE

Dean Goggles, Chairman Date: _____

EASTERN SHOSHONE TRIBE

Darwin St. Clair, Chairman Date: _____

NORTHERN CHEYENNE TRIBE

Llevando Fisher, President Date: _____

FORT PECK ASSINIBOINE AND SIOUX

AT Rusty Stafne, Chairman Date: _____

ROSEBUD SIOUX TRIBE

William Kindle, Acting President Date: _____

OGLALA SIOUX TRIBE

John Yellow Bird Steele, President Date: _____

CROW TRIBE

Cedric Black Eagle, Chairman Date: _____

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Appendix A-1

Undertaking Background, Purpose, and Description

Background:

The SURF site is contained within a footprint of the former Homestake Mine which was the largest gold mine in the western Hemisphere producing over 40 million ounces of gold during its operational years of 1875 (discovery) through 2001 (closure). Lead and Deadwood developed coincident with mining. Lead in particular was intertwined with the mine development as it was home to miners and was regularly impacted by Mine development. Much of the City's infrastructure was operated or supported by Homestake.

Most of Lead and a portion of the SURF property has been included in a National Register of Historic Places (NRHP) District ('District') because of its historical significance as a mining community. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure or object that is included in or eligible for inclusion in the NRHP. A goal of Section 106 is to identify and to consider historic properties that might be affected by a new project and attempt to resolve any adverse effects through consultation.

The SDSHPO was contacted concerning Section 106 compliance because of the large size of the District, the geographical extent of the Proposed Action in and near the District, and number of structures that would likely be contributing resources to the District that may have an adverse effect on the district. In 2013 the SDSHPO met with SURF on-site and toured potentially affected areas inside and outside the District. The SDSHPO recommended development of a Programmatic Agreement (PA) per 36 CFR 800.14(b). The PA outlines actions necessary to ensure necessary Section 106 consultation for the LBNF/DUNE undertaking *and* for future federally funded undertakings that will result in surface construction/disturbance or building(s) alteration.

Purpose:

DOE's Office of Science is the Nation's largest supporter of fundamental research in the physical sciences, which it pursues in partnership with national laboratories, universities, institutions, and other organizations with related missions. Fundamental research involves investigation and analysis focused on obtaining a better or fuller understanding of a subject, phenomenon, or a basic law of nature, not necessarily specific practical application of the results. One important research area within the physical sciences is Elementary Particle Physics, which has, as one of its goals, helping us to understand the physical nature of our Universe.

LBNF/DUNE would help to advance our understanding of the basic physics of the elementary particles called neutrinos. Neutrinos are elementary subatomic particles that have no electrical charge and are one of the most abundant particles in the Universe. In nature, they are produced in

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great quantities by sources such as our sun, from stellar explosions known as supernovas, and in smaller quantities on earth by manmade facilities, such as nuclear power plants. Neutrinos stream to the earth each day. The very small size of neutrinos means that they pass right through matter largely unimpeded, and only very rarely interact with other particles. In the lab, at facilities such as Fermilab, scientists can make neutrino beams for experimental purposes with particle accelerators.

LBNF/DUNE would make use of an existing high-energy particle accelerator at Fermilab in Batavia, Illinois (the Near Site) to generate a beam of neutrinos and would utilize particle detectors to analyze the beam, one at Fermilab and another detector with one or more modules approximately 800 miles away at SURF (the Far Site). Although DOE has other neutrino experiments currently underway, where the neutrino source and detector are separated by 500 miles or less, the longer baseline has been determined by scientists to be the optimal distance for this experiment and would enable scientists to gather important new information about neutrinos. The Far Site detector would be underground, to eliminate cosmic radiation that could interfere with the detector.

Neutrinos in flight naturally transform themselves quantum mechanically, by oscillating back and forth between three different states or “flavors” (muon neutrinos, electron neutrinos, and tau neutrinos). LBNF/DUNE would enable the most precise measurements yet of this neutrino oscillation phenomenon, which could potentially help physicists discover whether neutrinos violate the fundamental matter/antimatter symmetry of the Universe. If they do, then physicists would be a step closer to answering the puzzling question of why the Universe currently is filled preferentially with matter, while the antimatter that was created equally by the Big Bang has all but disappeared. So far, other sub-atomic particles known as quarks are the only elementary particles known to violate the fundamental symmetry between matter and antimatter. However, the observed violation of this symmetry in the physics of quarks is not sufficient to explain the observed abundance of matter over antimatter in the Universe.

The LBNF/DUNE Near Site detector at Fermilab and the Far Site detector deep underground at SURF would produce the best data for answering these questions. The Near Site detector would provide data on the quality of the beam as it leaves Fermilab and add to the precision of the measurements. The deep detector at the Far Site, shielded from cosmic radiation, would provide the most sensitive measurements of oscillations of the neutrinos sent from Fermilab. A deep detector would also enable sensitivity to proton decay and the capability for measuring electron neutrinos from a supernova should one occur in our galaxy during the Experiment’s lifetime. The SURF site would provide the necessary long baseline (800 miles from accelerator to detector) and the capability to construct a large detector deep underground to shield the detector modules from interference by cosmic rays. For these reasons construction of a LAr detector deep underground (4,850 feet deep) at SURF would generate the most accurate data, and is recommended by the international collaboration.

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As answers to these questions are pursued by LBNF/DUNE, other experiments that would make use of the same detectors and/or laboratory infrastructure may provide additional opportunities for basic research in other areas of physics. In short, LBNF/DUNE and ancillary experiments would enable scientists potentially to transform our understanding of neutrinos and their role in shaping our Universe.

Description of Undertaking:

The DOE is proposing to construct and operate the LBNF/DUNE with facilities at Fermilab in Batavia, Illinois, and SURF in Lead, South Dakota. An Environmental Assessment (EA) has been prepared pursuant to NEPA. Under the Proposed Action Undertaking and Alternative A, Fermilab would construct new facilities that would extract a proton beam from their existing particle accelerator, generate from that a high-intensity neutrino beam, and then direct the beam at a detector(s) constructed 1,300 kilometers away at SURF in Lead, South Dakota. The beam would be generated underground and would travel through the Earth at depths of up to 20 miles. The EA determined potential impacts to the human health and the environment from LBNF/DUNE, one of which is related to cultural resources at the SURF site. Particularly important is the identification of existing and eligible historic properties in and near the SURF site that may be impacted due to construction and operation of the LBNF/DUNE, as well as plans for addressing those impacts. The Undertaking pursuant to the National Historic Preservation Act is limited to those activities described in the EA which would occur at or around the SURF site.

- One underground liquid argon detector with four detector modules;
- A new surface building to support the underground detector. This building would replace the existing Ross boiler building and its associated stack. The new structure would consist of mechanical and electrical components to facilitate delivery of liquid argon and liquid nitrogen to the 4850 Level;
- Excavation of 460,000 yd³ (750,000 tons) cavern at the 4850 level in the Davis Campus of SURF
- A conveyance system to move the excavated rock. The rock would be hoisted to the surface and conveyed to the Gilt Edge Superfund Site or Homestake's Open Cut. Conveyance methods could include:
 - i. Conveyor/Trucking - a newly constructed conveyor would transport rock southwest to Kirk Road. The conveyor would dump into a truck load-out bin. Trucks would haul the rock to the Gilt Edge Superfund Site, using Kirk Road, Highway 385, and the Gilt Edge Road, *or* to the Open Cut, using Kirk Road, U.S. Highway 85, U.S. Highway 14A, and Homestake's private access road.
 - ii. Combination rail-pipe conveyor - rock would be moved to the Open Cut using Homestake's former tramway and pipe conveyor corridors. The underground tramway's rail line would be rehabilitated and used to move rock 1-mile to a

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transfer station near the tramway's portal. A *new* pipe conveyor would then be loaded and transport the rock to the Open Cut utilizing the former Open Cut pipe conveyor corridor.

- iii. Rail line - rock would be conveyed to the Open Cut via the existing tramway and the pipe conveyor corridors using a narrow gage rail line and rail cars. No transfer station or pipe conveyor would be utilized.
- Reasonably foreseeable future physics experiments also investigating fundamental particles. These experiments would be smaller, both individually and in aggregate. Features include:
 - i. Excavation of approximately 153,000 yd³ (250,000 tons) of rock to create underground caverns for equipment and working space.
 - ii. The excavation and construction would occur after that for the liquid argon detector and support building described above. Excavated rock could be disposed of in existing underground spaces or be dispositioned similarly to the three methods described above.
 - iii. Construction of potential surface support structures.

Approximate Schedule:

Site preparation and excavation, including transportation of excavated rock	2017 – 2021
Buildings and infrastructure	2017 – 2021
Underground installation	2020 – 2023
Cryogenics construction and filling	2023 – 2024
Operations	2024 – 2044
Decommissioning	2044 – 2054

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Appendix B Applicable Terms, Standards, and Guidance

Terms used in this PA are defined in 36 CFR Part 800. In addition, the following standards and guidance are applicable to this PA.

1. The *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 Federal Register (FR) 44716-42, September 26, 1983) (including the *Standards for the Rehabilitation of Historic Properties* (Rehabilitation Standards), *Standards for the Identification and Evaluation of Historic Properties* (Identification and Evaluation Standards), and *Standards for the Documentation of Historic Properties* (Documentation Standards), and *Professional Qualification Standards*)
2. *South Dakota Historic Resource Survey Manual* (Architectural) (2006), South Dakota State Historic Preservation Office
3. *South Dakota Guidelines for Compliance with the National Historic Preservation Act and South Dakota Codified Law 1-19a-11.1* (2012), South Dakota State Historic Preservation Office
4. ACHP, *Guidance on Conducting Archeology Under Section 106* (2007)
5. ACHP, *Policy Statement Regarding the Treatment of Burial Sites, Human Remains, and Funerary Objects* (2007)
6. ACHP, *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities* (1991)

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Appendix C

Activities that Do Not Have the Potential to Adversely Affect Historic Properties and that are Excluded from SDSHPO Review

The following activities are considered not likely to cause adverse effects to historic properties to warrant documentation and consultation under this PA. These activities may be performed by SDSTA without further review under the PA or providing information to the Signatories or Consulting Parties.

1. All activities occurring underground inside the former Homestake Mine.
2. Work, except building additions, on buildings less than 45 years of age.
3. Repointing with mortar that matches the original in color and composition. Joint profile and tooling must be the same.
4. In kind painting or paint removal as long as removal does not use high powered water or sand blasting.
5. In-kind replacement of roofing, siding, foundation, windows, and doors.
6. HVAC/mechanical work on buildings unless it requires significant physical alteration of the architecture.
7. Maintenance of landscaping, parking lots, and supply areas.
8. Construction of new parking areas in previously disturbed areas.
9. In kind routine repair of landscape and facilities due to storm damage to return operations.
10. Placement of excavated rock in the Open Cut or transport to the Gilt Edge Site.
11. Transportation of construction materials or excavated rock on existing roads that are not adjacent to historic properties or pass through historic districts.
12. Installation of subsurface utilities in areas of previous disturbance.
13. Maintenance of existing roads on or off SDSTA property.
14. Use materials from a commercial source such as gravel, sand, borrow, etc.
15. Interior work that does not impact the façade or interior character-defining features, if remaining.

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Appendix D

Procedures for Discovery of Human Remains on State or Private Lands (State Burial Procedure)

In the event of an inadvertent discovery of human remains or funerary objects the following steps shall be taken pursuant to South Dakota Codified Law Chapter 34-27-25, 34-27-28, 34-27-31.

1. SDSTA and its contractors shall immediately halt construction activities within a 150 foot radius from the point of discovery and implement measures to protect the discovery from looting and vandalism. No digging, collecting, or moving human remains or other items shall occur after the initial discovery. Protection measures may include the following:
 - A. Flag the buffer zone around the find spot;
 - B. Keep workers, press, and curiosity seekers, away from the find spot;
 - C. Tarp the find spot;
 - D. Prohibit photography of the find unless requested by an agency official; and
 - E. Have an individual stay at the location to prevent further disturbance until a law enforcement officer arrives.
2. SDSTA shall notify local law enforcement and DOE, and the South Dakota State Archaeologist (State Archaeologist) within forty-eight (48) hours of the discovery.
3. SDSTA, in consultation with DOE, shall notify the South Dakota State Historic Preservation Office (SDSHPO), American Indian Tribes, and other Consulting Parties within forty-eight (48) hours of the discovery.
4. If local law enforcement determines that the remains are not associated with a crime, SDSTA, in consultation with DOE, shall determine if it is prudent and feasible to avoid disturbing the remains. If SDSTA, in consultation with DOE, determines that disturbance cannot be avoided, DOE, in consultation with SDSTA, shall consult with the State Archaeologist, SHPO, American Indian Tribes, and other Consulting Parties to determine acceptable procedures for the removal, treatment, and disposition of the burial or remains. DOE shall ensure that SDSTA implements the plan for removal, treatment, and disposition of the burial or remains as authorized by the South Dakota State Archaeologist.
5. DOE shall notify the SDSTA that they may resume construction activities in the area of the discovery upon completion of the plan authorized by the State Archaeologist.

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Appendix E

Preferred Treatment Measures for Historic Properties

1. Intensive-Level Documentation of Demolished Buildings and Structures

A. Prior to demolition of a property located within the Lead Historic District or any property individually listed or determined eligible for listing on the NRHP, SDSTA, in consultation with DOE, would document the property as follows:

- 1.) sketch plan
- 2.) Photographs
 - i. exterior and interior
 - ii. digital
 - a. 300 dpi; 2000-3000 pixel
 - b. TIFF (either original or converted)
 - c. converted to black and white images
 - d. label that includes name, location, and direction and date of photograph
(Example: Ross Boiler, Lead SD_NW)
 - e. photographs on CD-R Archival Gold Disk; both disk and case labeled with project name, number and date.

B. History Report.

- 1.) architectural description (can embed images or other pertinent information)
- 2.) building/structure history
- 3.) information can be obtained from secondary sources
- 4.) bibliography
- 5.) PDF of report on CD-R Archival Gold Disk (can be on same disk as photographs).

This documentation would be subject to a review per Stipulation 5, and be accepted by the SDSHPO prior to demolition of the property.

2. New Undertaking-related Above Ground Construction

When occurring within or near the boundaries of the Lead Historic District, new construction would follow the Secretary of the Interior's Standards for the Treatment of Historic Properties, revised 1995, National Park Service, U.S. Department of the Interior, specifically the new construction provisions of the Standards for the Rehabilitation of Historic Properties (Rehabilitation Standards), which is in the cited Treatment Standards.

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3. Excavated Rock Transport and the Lead Historic District

- A. The Undertaking will involve the expansion of underground laboratory spaces and removal and transport of excavated rock to either the Gilt Edge Superfund site or Homestake's Open Cut. Removal of underground excavated rock and disposal does not require review by the Signatories. The transport of excavated rock to the Open Cut would require design and operation as outlined below.
- B. DOE and SDSTA would design, construct, and operate the excavated rock transport (e.g., truck, rail, pipe conveyor) system in a manner that minimizes visual, auditory, and vibrations effects to historic properties to the extent feasible. Beginning at the conceptual design stage, DOE and SDSTA would work cooperatively with the Consulting Parties to incorporate measures into the design of the transport infrastructure to minimize effects to the Lead Historic District. For the rail and/or pipe conveyor transport systems, DOE and SDSTA would use historic photographs and other information about Lead's historic tram mining and recent conveyance infrastructure (such as the pipe conveyor system) as a reference for the design of the new infrastructure. The infrastructure design would follow the new construction recommendations of the Secretary of the Interior's Standards for Rehabilitation and be reviewed per Stipulation 5.

4. Mickelson Trail

Within one year of the execution of this PA, SDSTA, in consultation with DOE, the Cities of Lead and Deadwood, SDGFP, and the SDSHPO, will install one or more interpretive signs on the Mickelson Trail near the Oro Hondo Complex and at other locations on the trail where Undertaking elements are nearby. The sign(s) will describe the history of the former Homestake Mine and the scientific activities at SURF.

5. Other Mitigation Measures

In addition to the standard mitigation measures described above, SDSTA, in consultation with the other Signatories and Consulting Parties, may adopt other alternative measures to avoid, minimize, or mitigate effects to historic properties including but not limited to developing educational materials, historic property management plans, tribal education and outreach programs, etc. Mitigation may be directly or indirectly related to the Undertaking.

All mitigations would require the involvement of qualified professionals. They would also be subject to SDSHPO review and acceptance.