



MAKING AN IMPACT:

NAVAJO CENTER FOR THE ENVIRONMENT



Making an Impact

During the Cold War, 30 million tons of uranium ore were mined on or adjacent to the Navajo Nation, leaving more than 500 abandoned mines. Since 2008, EPA has been addressing issues related to mines, resulting in enforcement agreements and settlements valued at \$1.7 billion earmarked to reduce the highest risks of abandoned uranium mine (AUM) radiation exposure. Funding is available to begin assessment and cleanup at 211 of the 523 AUMs, with federal agencies and the Navajo Nation working together. Navajo Technical University is determined to lead such efforts, but it must first obtain an EPA certified environmental laboratory in order to access settlement funds to conduct remediation work that will benefit the Navajo Nation, Northern Arizona, and the U.S. economy as a whole.

The economic impact of creating approximately 1,000 jobs in a part of Arizona that has a 40% unemployment rate is significant. The payroll alone for the cleanup is estimated to be as high as \$45,000,000 per year at the cleanup activity's peak. The lab itself will be bringing another \$1,000,000 per year into the local economy by charging fees to contractors, the federal government, and the Navajo Nation for testing, research, and analysis activities. In addition, the Navajo Nation is intending to leverage contracts for local Navajo and Northern Arizona companies through partnerships arranged as a result of the expertise brought in to Chinle to man the lab and the education and training programs that will be put into place.





Valynda Smith participates in a pinyon pine research project in partnership with Northern Arizona University. Such collaborations could be furthered with the NCE.

Getting A Return on Investment

Economic development opportunities that involve higher education institutions often provide layered benefits. The EPA certified environmental laboratory will have three major economic impacts on the Northern Arizona region:

1. Through the building of the laboratory and the hiring it will justify:

DIRECT IMPACT
\$7 MILLION
 Construction costs

INDIRECT IMPACT
\$28.7 MILLION
 And 135 jobs

2. Through jobs created because of training activities related to the abandoned uranium mine settlements that will utilize lab resources - both new hires and displaced workers from the coal and energy sector will be served through training activities at the laboratory:

- a. Creation of approximately 1,000 jobs with annual payroll of \$45,000,000
- b. Indirect Economic Impact of \$100,498,500
- c. Annual Lab Revenues of \$1,000,000

3. Through Science, Technology, Engineering, and Math (STEM) education that will utilize the lab as part of the general and science education program at the Chinle Instructional Site:

- a. Opportunity for hands-on experience in a STEM career
- b. Career training for students and displaced workers
- c. Increase STEM graduates in Northern Arizona

The Six Goals of the NTU Navajo Center for the Environment

NTU will focus on six core goals in order to maximize the impact of the Navajo Center for the Environment. The six goals for the NCE are:

1. To provide Northern Arizona a science-based, multi-disciplinary Center located within NTU that is capable of providing the region with advice and potential solutions as it faces a complex of issues that impact the health and well-being of the Navajo people.

2. To develop an EPA Certified laboratory for the study of water, mining wastes, plants, animal, and air at NTU.

3. To develop, accredit, and offer vocational, academic, and graduate curriculum that will provide certification for Navajo students to find jobs in environmental superfund cleanup on the Navajo Nation.

4. To develop Navajo Nation-based, federal, state, and private funding to further the work of the Navajo Center of the Environment.

5. To create a Navajo Center of the Environment that will meet goals of the NNEPA and NTU, providing not only certified labs, but also the infrastructure for national experts that NNEPA wishes to bring for consultation and/or educational purposes to the Navajo Nation.

6. To ensure that funding for environmental projects take a systems integration approach that benefits the Elders, Youth, Veterans, Infrastructure and economic goals of Northern Arizona while providing mitigation solutions to problems and challenges in the environment.

Providing a Solution to the Changing Economy of Northern Arizona

A corollary to this particular impact is the changes occurring in the energy economic sector on the Navajo Nation and in Northern Arizona because of the closure of mines and power plants. Just the shutdown of the Peabody mine and the power plant – known by its acronym, NGS – “would deprive the Navajo reservation of its two largest non-governmental employers. The 43-year-old generating station and its sister coal mine employ more than 700 people, many at salaries of more than \$100,000 a year, a small fortune in the depressed economy of Northern Arizona. Another 2,300 jobs in the region are linked to the two major employers.

The lab will also have an impact on STEM education at the Chinle Instructional site. The jobs will attract students who will want to find local jobs in the AUM cleanup efforts. However, the lab’s existence will also emphasize the importance of STEM careers to Navajo students. The facility, its equipment, and personnel will be important to that effort, building on the strong record of STEM degrees and career training already present at NTU. The importance of the lab’s role in increasing the number of STEM majors graduating in Northern Arizona also needs to be taken into account when examining the likely economic impact of the lab’s creation.

A Timeline in Developing the NTU NCE Two year projection

The next two pages detail a two year projection in getting the EPA certified lab fully operational. The projection includes establishing new degree and certificate programs, forging strategic partnerships, and staffing the center as it undergoes construction.



NTU established a MOU with NAU in 2016 to better articulate courses between the two institutions.

■ 30 DAY OBJECTIVES

- Establish Scope of Work with partners, including NNEPA
- Inventory of Strengths, Weaknesses, Opportunities, and Trends
- Preliminary schematic design for NCE
- MOU with New Mexico State University concerning its clay water filter lab testing
- MOU between NTU and NNEPA

■ 60 DAY OBJECTIVES

- Hire Director for NCE
- Obtain Super 8a status
- Complete clay water filter lab testing

Estimated cost of a 9,000 SF Analytical Lab with at least two classrooms:

The estimated cost for an EPA certified lab is \$6,300,000. The cost breakdown is as follows:

\$3,825,000	9,000 SF @ \$425 SF (Cost of Wet Lab addition at NTU Crownpoint)
\$500,000	Estimated Architecture & Engineering
\$1,651,000	Cost of specialized lab equipment
+\$324,000	Cost of Furniture, Fixtures and other Equipment
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\$6,300,000	Total Cost of Analytical Lab

A collaborative means to fund the NCE

Navajo Technical University has \$800,000 budgeted for the project. The Navajo Nation EPA has pledged \$500,000 for A & E. NTU is asking the Navajo Nation Council for \$2,000,000. These funds will be used to match the proposed \$3,000,000 from the Arizona State Legislature. The remainder of the needed funds will come from a variety of grant sources in the NTU budget. The organizations and agencies assuming the cost of the NCE are as follows:

\$2,000,000	Navajo Nation (matching funds)
\$500,000	Navajo Nation EPA (secured)
\$800,000	Navajo Technical University (secured)
+\$3,000,000	Arizona State Legislature (proposed)
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\$6,300,000	Total Cost of Analytical Lab

■ 90 DAY OBJECTIVES

- Hire Assistant Director
- SIO Framework designed
- Curriculum map completed for Environmental Science curriculum for Uranium Remediation and Clean Water
- Curriculum submitted to HLC on trucking and tanker and large equipment certificates
- Curriculum submitted to HLC on A.A.S. in Environmental Chemistry
- Clay Prototype designed
- Bidding documents for NCE needs and attributes/capabilities
- Identify all fields, including graduate degrees, that NTU will develop curriculum for in order to serve Navajo environmental needs

■ 5 MONTH OBJECTIVES

- Begin bidding of Navajo remediation contracts through Navajo-owned firms
- Submit to HLC curriculum on Uranium Remediation and Clean Water
- Complete list of desirable research projects to be tackled by the NCE
- Begin purchase of equipment for EPA certified lab

Requirements for Navajo Center for the Environment:

Approximate Building Size: 50,000 square feet

Suggested: Three story energy efficient building with views from offices

• Laboratories

- | | |
|---------------------------|--------------------------|
| 1. Nuclear Lab | 5. Process Chemistry Lab |
| 2. Water Chemistry Lab | 6. Botany Lab |
| 3. Analytic Chemistry Lab | 7. Zoology Lab |
| 4. Biology Lab | 8. Computation Lab |

• Classrooms

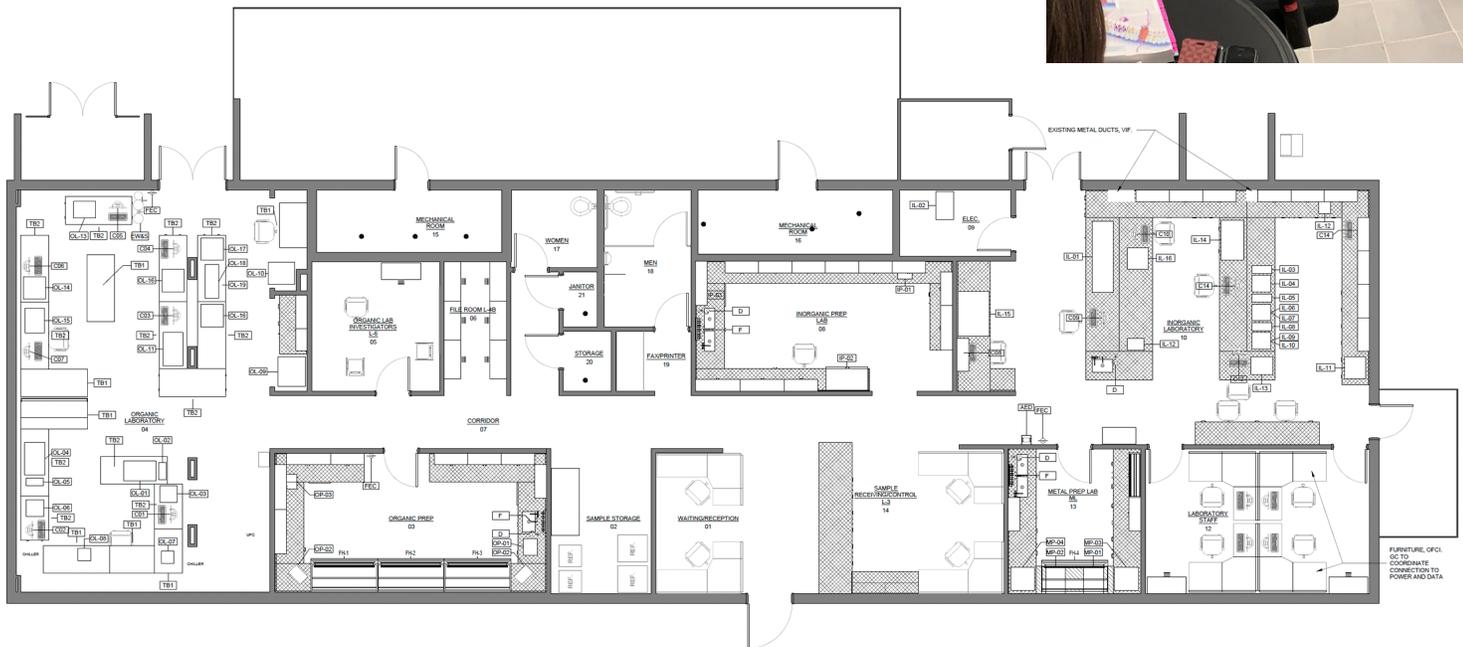
(3 medium size, 1 a computer lab type classroom)

Conference Rooms (3- 1 large, 2 small)

Auditorium (seats 20) (optional)

• Personnel

(Director, Receptionist/Administrative Assistant, Business Manager, Data Analyst/Modeler, 10-20 Scientists, Lab Assistant for each laboratory)



■ 6 MONTH OBJECTIVES

- Begin work on first research projects
- Develop web presence for the Navajo Center on the Environment
- Hire PhD to develop graduate curriculum

■ 9 MONTH OBJECTIVES

- Complete architectural/engineering work for the Navajo Center on the Environment
- Receive approval from HLC on Trucking, Tanker, and Large Equipment certificates



Role of the Lab in Education/Training Efforts

Part of the plan is to use the education and training efforts made possible through the lab's creation to provide the opportunity for displaced workers to receive the AUM cleanup training and education necessary to find jobs in the cleanup effort. It is difficult to estimate how many displaced workers will avail themselves of the NTU NCE's training opportunities, but every time a recently unemployed worker finds a future in such jobs, a double economic impact is achieved.

Project Overview Timeline

• CONSTRUCTION

July 2020 - Award Architectural & Engineering
 Oct. 2020 - Design Building

Nov.-Dec. 2020 - Bid Project and Award Contract - two (2) months;
 Jan. 2021 - Start Construction; seven (7) months - Aug. 2021

• HIRING STAFF

Fall 2021 - Hire two (2) Chemistry Instructors / Scientists
 Spring 2022 - Hire five (5) student Interns to be trained as Lab Technicians

• COURSE OFFERINGS

Spring 2022 - Offer Lab / Analytical courses with existing staff using new Lab Space in 20,000 SF Academic Building opening Fall 2020.

Fall 2022 - Additional Courses = Hazmat Certification Courses

• PURCHASING EQUIPMENT

Spring 2021 - Equipment for 5000SF Wet Lab space in new 20000SF Academic Building.
 Summer 2021 - Purchase Lab Equipment. Building scheduled for completion July 2021.

• LAB SET-UP / CERTIFICATION

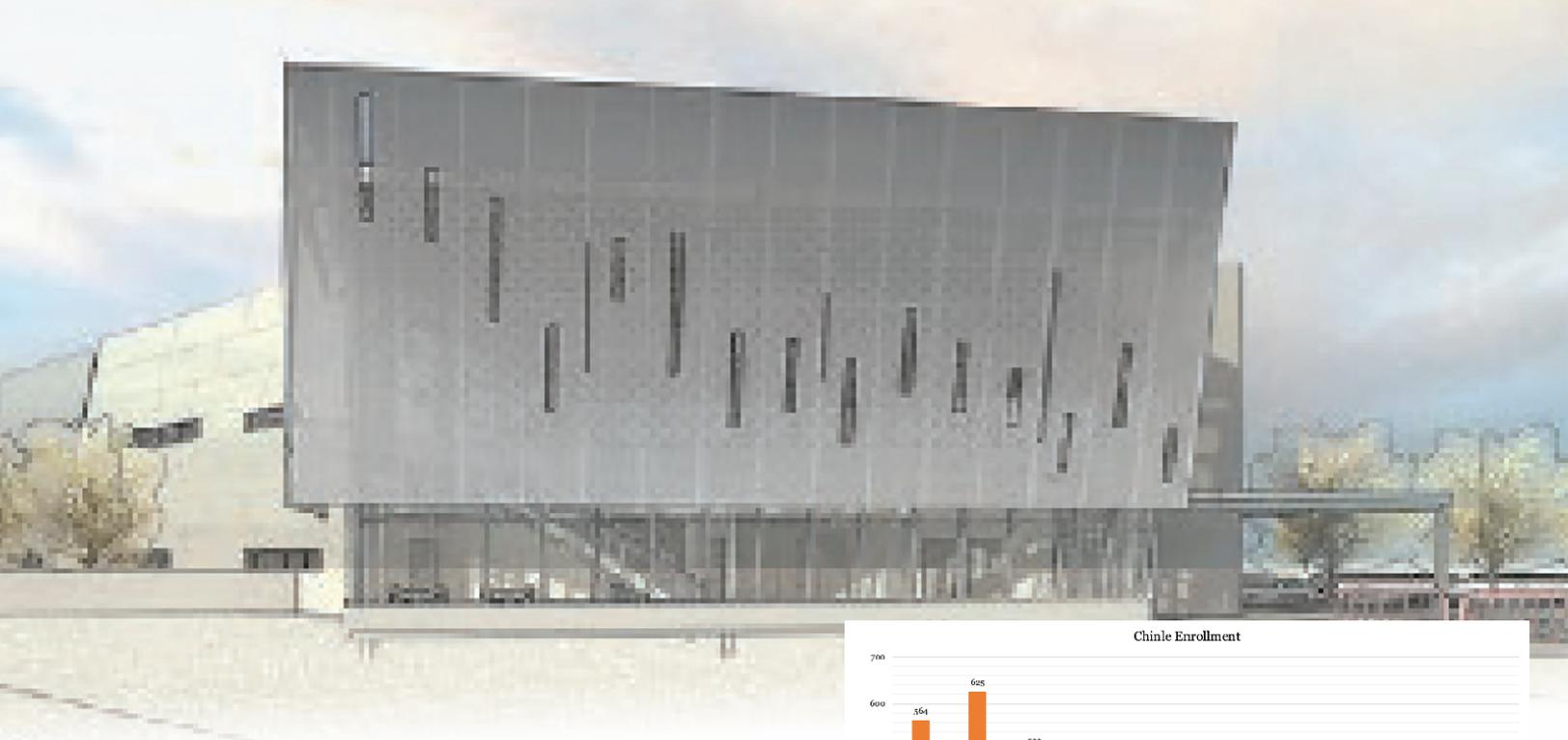
Fall 2021 (November - December 2020) Install / Set-Up Equipment and complete Lab Certification requirements.
 Jan. 2022 - Lab Certified in full operation.

■ 12 MONTH OBJECTIVES

- Begin construction on NCE
- Complete design of graduate curriculum for submittal to HLC
- Receive approval from HLC on Environmental Science curriculum for Uranium Remediation and Clean Water curriculum
- Receive approval from HLC on Environmental Chemistry curriculum
- Finish design for a visiting scholar program in concert with NNEPA

■ 2 YEAR OBJECTIVES

- Receive approval from HLC on Environmental Health curriculum
- Receive approval from HLC on first graduate degree
- Complete building for the Navajo Center on the Environment
- Generate not less than 50 million dollars in contracts for remediation work for Navajo firms
- Implement graduate student work on environmental water and remediation problems in concert with undergraduate senior seminar assignments



Improving Outcomes by Focusing on Accessibility

In 2014, NTU's Chinle instructional site saw its largest enrollment with over 600 students; however, the population was hard to maintain due to the lack of infrastructure available at the site. Classes were held out of two double wide trailers and Chinle High School. Many students continued their studies elsewhere. As a result, the Chinle site's retention rate dipped to 38 percent and the graduation rate fell to 20 percent. To reverse the trend, NTU invested its time and resources to develop a new campus that currently includes a 6,000 SF classroom building and a 20,000 SF academic building (pictured above) to better address student's academic needs. Once the academic building is functioning, enrollment is expected to climb well above 600 students. Both the the classroom building and the academic building have been constructed utilizing Arizona state funding.

Improving Outcomes by Focusing on College Readiness

NTU has focused its efforts on college readiness to improve its graduation and retention rates. As a result, enrollment in dual credit courses has increased drastically over the last several years (see graph to the right). The university has also incorporated different strategies, such as summer developmental course tuition waivers and pathway programs, to help in getting students acquainted with college coursework rigor. With each strategy, our the growth of our new campus, NTU expects to see improvement across the board at our Chinle instructional site.

