

Outdoor Water Efficiency Proposal Project Application

Green Fund Mission Statement: “The NAU Green Fund promotes student participation in and provides funding for projects that reduce NAU’s negative impact on the environment and create a culture of sustainability on-campus.”

REQUIREMENTS FOR FUNDING:

- The project must be implemented on the Flagstaff Mountain Campus.
- The person submitting the project must be a NAU student, faculty, or staff member.
- Projects must provide all necessary documents, letters of support, and authorizations prior to submission.
- The Green Fund distributes funding on a **reimbursement basis**. Project teams should partner with an administrative office to provide upfront funding for the project. Once the project has been successfully completed, the Green Fund will reimburse the administrative partner.
- All project applications should be submitted to greenfund@nau.edu for review.

DISCLAIMERS: All applications will go through a comprehensive vetting process, and you may be asked to provide more detailed information. **The Green Fund is not responsible for acquiring the necessary permits, permissions, or approvals for a project, although we are happy to assist with this process if needed.** Additionally, the Green Fund does not provide any ongoing maintenance costs unless otherwise specified by the committee. A sponsoring department must take responsibility for operations and management. The Green Fund Committee only meets during the academic year. All projects submitted outside of the regular academic year will be reviewed at the start of the next academic session.

REVIEW PROCESS: Upon project application submission, the Green Fund will begin to review your project within two-three weeks. At this time, the Green Fund will provide comments on the project. **This process can extend for long periods of time depending on the scope of the project.** Incomplete applications will not be reviewed until all components are submitted.

We highly recommend meeting with a Green Fund Committee member prior to submitting the application. The Green Fund Committee member will assist you with the proposal writing process, if needed.

CONTACT INFORMATION

Contact Information

Project Leader Name: Gracie Marker

Phone: 480-466-1162

NAU Email: gim29@nau.edu

Expected Graduation Date (if applicable): May 2025

Project Name: Outdoor Water Efficiency Proposal

Project Advisor Information

Project Advisor Name: Erik Nielsen

Phone: 928-523-4980

NAU Email: Erik.Nielsen@nau.edu

NAU Department/Unit for Funding Reimbursements: Office of Sustainability

PROJECT OVERVIEW

Please answer the following questions to the best of your ability, for questions that are not applicable, please list N/A.

Executive Summary

Please provide a brief overview of your proposal. Please address how this project will support the goals of the Green Fund (student involvement, creating a culture of sustainability, and lessening NAU's impact):

This proposal will incorporate multiple components which are part of an effort to reduce outdoor water use. This proposal will provide funding in tandem with a water conservation grant which NAU received to fund Calsense and turf grass removal on campus. These components include:

1. Purchase and install Calsense irrigation systems
2. Conversion of turf grass to low water, native vegetation

1. To date, over 30% of NAU's irrigation is operated through Calsense, a smart irrigation system. Calsense intelligently monitors soil moisture, humidity, and rainfall to sense when, how much, and how often to water a turf grass area. The smart controls are projected to reduce water use by 20%. With this in mind, we are expanding the Calsense system to reduce water use on areas that are intended to remain as functional turf grass according to the NAU Master Plan. The scope of this work includes the cost of purchasing and installing 4 new Calsense controllers. The Calsense systems are estimated to save 2,600,000 gallons of water per year. This is equivalent to the yearly water use of 24 U.S. households or filling 144 swimming pools. Please refer to the attached map for the site locations.
2. The second part of this proposal is to provide additional funding for turf grass conversion. Approximately 38,000 square feet will be converted to native landscaping with low water usage. The turf grass conversion is projected to save 1,060,000 gallons of water per year. This is equivalent to the yearly water use of 10 U.S. households or filling 59 swimming pools. Accompanying the turf conversion, crusher fines paths and seating features are also to be implemented to encourage students to connect with these natural spaces. Please refer to the attached map for the site locations.

Project Components

1. Does your project require space or construction on campus? If so, where? Please review the "Space Committee Document" located on our webpage and follow the steps to begin requesting a location.

Yes, this project will require construction on campus. However, we have already established a Facilities Services project and project manager, Tad Green. Janel Wilcox, the chair of the Space committee and the NAU Landscape Architect, and Matt Espino, the Manager of Grounds, are actively involved in the planning of this project.

2. Have you obtained all necessary approvals for this project? The Green Fund is not responsible for acquiring the necessary permits, permissions, or approvals for a project, although we are happy to assist with this process if needed. Please attach all letters of support to this application. Letters of support should include confirmation from the sponsoring department that the sponsoring department will cover all upfront expenses and work with the Green Fund Business Manager to acquire reimbursement after project completion.

Yes, as the Facility Services project manager, Tad Green will be responsible for obtaining all necessary permits for this project. He is aware of the process and will handle all project approvals without issue. Attached to this proposal is a letter of support from Erin McAnally-Trejo, NAU's Energy and Water Conservation Manager.

3. The Green Fund does not provide any ongoing maintenance costs unless specified within the budget and approved by the committee. A sponsoring department must take responsibility for operations and management.

This project is not requesting funds for ongoing maintenance.

4. Will this project provide funding for student wages? Coordination of wages must be done through the sponsoring department and must be included within the project budget.

No.

5. Please list all additional sources of funding you have pursued, including department, grants, ASNAU graduate, student government, etc.

The Office of Sustainability has received funding for this project from the Water Infrastructure Finance Authority of Arizona (WIFA) Water Conservation Grant Fund. The department was awarded \$687,931.70 of grant money. As a condition of the award, NAU must contribute a 25% match to the grant funding equal to \$171,982.93. Receiving funds from Green Fund will help partially meet the 25% match. The remainder of the funding will be provided by the Sustainable Revolving Fund and the City of Flagstaff water conservation rebate program.

Project Specifics

1. Is there a public outreach plan? How do you plan on communicating your project with the NAU community? Do you require assistance from the Green Fund in your outreach plan?

Outside of the project outreach that is already done on behalf of the Green Fund, the Office of Sustainability and its current Americorps members will be doing outreach for the larger scale turf conversion project which encompasses Calsense. Additionally, the Calsense data can be utilized within student research, such as in capstones, which can expand the knowledge of the program and the wider turf conversion efforts happening at NAU.

2. Are you working with other groups on or off campus? If so, describe your partnership.

WIFA plays a relatively small role in this proposal, however, they are the main funding body for the overall turf conversion grant that the Office of Sustainability received. Caliente Construction has been contracted to carry out the construction and work that needs to be done on the ground for this project. They have subcontracted Morning Dew, a local landscaping company, to install and program the Calsense equipment. NAU has a pre-existing partnership with Morning Dew and Caliente Construction, as they have been contracted to install previous Calsense expansions.

Project Parameters

1. What are the environmental costs and benefits associated with your project?

Installing Calsense irrigation systems on 315,000 square feet (7 acres) of functional turf grass will reduce water use by 20%, saving an estimated 2,600,000 gallons per year. Environmental costs are relatively small, with installation having minimal disturbance to pre-existing irrigation systems. Aside from the spaces currently being tracked on Calsense, NAU does not have a system in place to distinguish areas that do and do not need watering, resulting in overwatering large portions of landscaping. This will improve NAU's water use efficiency around campus while also reducing overall water use.

Removal of 38,000 square feet of non-functional turf grass will reduce water use by nearly 100%, saving an estimated 1,060,000 gallons of water per year. This landscape conversion will also help to increase native biodiversity and promote the growth of native plant species in surrounding areas. Compared to existing turf grass landscapes, these areas will use a reduced amount of pesticides, which will lessen soil erosion and allow for more water infiltration, reducing flooding. Runoff from these landscapes will result in a decrease of chemical infiltration in surrounding food and water sources. The crusher fines paths and seating features will allow students to connect to their surroundings and foster social interactions, providing more accessibility to natural spaces. The environmental costs for turf grass conversion and features are minimal. Surrounding natural spaces may experience disturbance during turf removal and plug installations, although turf removal would be a one-time procedure and plug installations would only occur seasonally. These spaces may experience an increase in human disturbance due to the promotion of student interaction through benches and gravel paths.

2. Is this a one time expense or will you require future funding for your project?

The Calsense install, turf conversion, and implemented features will be a one-time expense.

3. How will you measure and monitor the impact of your project after its implementation?

Calsense sensors are accompanied by an online interface to track water usage across campus. Adding the additional sensors will allow us to expand this interface to continue tracking water use. Calsense data has also been the center point for conversion efforts through student-led research, such as in capstones. We can continue to monitor the impact of this project through student involvement with the data. In addition, this project should significantly reduce overall water use on campus which is metered as water enters campus. After completion of this project, there should be a noticeable and sustained reduction in water use on campus.

Project Budget

Please include a thorough breakdown of all project costs as well as **justification for each line item**, as well as a 5% line item for contingency. Based on the parameters of the project, the committee may increase or decrease this contingency. **Make sure to include all potential taxes or costs associated with each item.**

Item	Quantity	Price	Justification
Purchase and installation of new Calsense sensors & flow meters	4x	\$35,548.70 Parts \$33,772.30 Labor <hr/> \$74,321.00 Total	Purchase and install of 4 new controllers to help reduce water use on functional turf areas. This will be included in NAU's 25% grant match requirements.
Turf grass conversion and interactive features	1x	\$45,679.00 Turf Conversion \$30,547.66 Features <hr/> \$76,226.66	Cover part of the cost associated with the turf grass conversion. Cost of 3 recycled tables with 4 seats, 2 recycled tables with 3 seats, 2 benches, and shipping. This will be included in NAU's 25% grant match requirements.

5% Contingency	\$7,500
Total Project Cost	\$158,047.66

Project Timeline

Please provide a timeline for the significant dates of your project. Please add all relevant information and consider any holidays/breaks and time required to obtain necessary approvals. **Please be as specific as possible.**

Actions & Parties Involved Phase 1: Preconstruction	Month/Year
Phase 1: Preconstruction of JOC proposal submission and NAU review and issue of JOC contract	October 2024
Phase 1: Execute turf conversion	October 2024
Phase 1: Irrigation Controls Development and NAU issue to execute	October 2024
Phase 1: Execute irrigation controls construction	November 2024
Phase 1: Calsense lead time; Irrigation controls equipment	November 2024
Phase 1: Landscape design costs and document development	November 2024
Phase 1: Landscape Design Development and submission of the GC pre construction Proposal	January 2025
Phase 1: Execute landscape construction	January 2025
Phase 1: Landscaping material delivery	February 2025 to April 2025

Anticipation Date of Completion	Phase 1: Spring 2025
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Actions & Parties Involved Phase 2: Construction of Irrigation Controls	Month/Year
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Phase 2: Central Quad Recreation Area Irrigation Controls Installation	November 2024
Phase 2: Gabaldon Hall Irrigation Controls Installation	December 2024
Phase 2: Communications/Riles Irrigation Controls Installation	December 2024
Phase 2: Gammage Irrigation Controls Installation	December 2024

Anticipated Date of Completion	Phase 2: December 2024
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Actions & Parties Involved	Month/Year
Phase 3: Landscaping	
Phase 3: Blue Staking	April 2025
Phase 3: Landscape Construction at Adel, McDonald, Raymond, and SBS West	April 2025 to August 2025

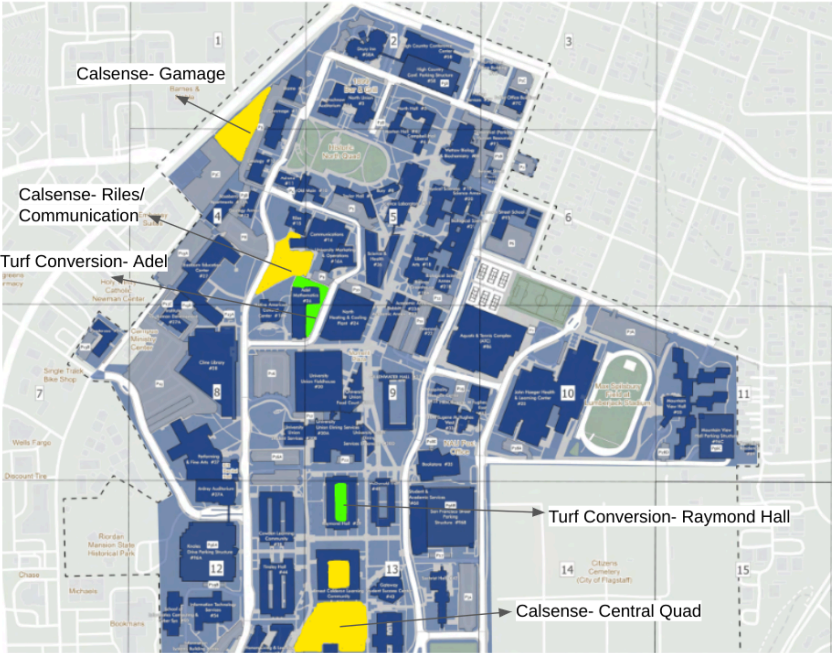
Anticipated Date of Completion	Phase 3: Summer 2025
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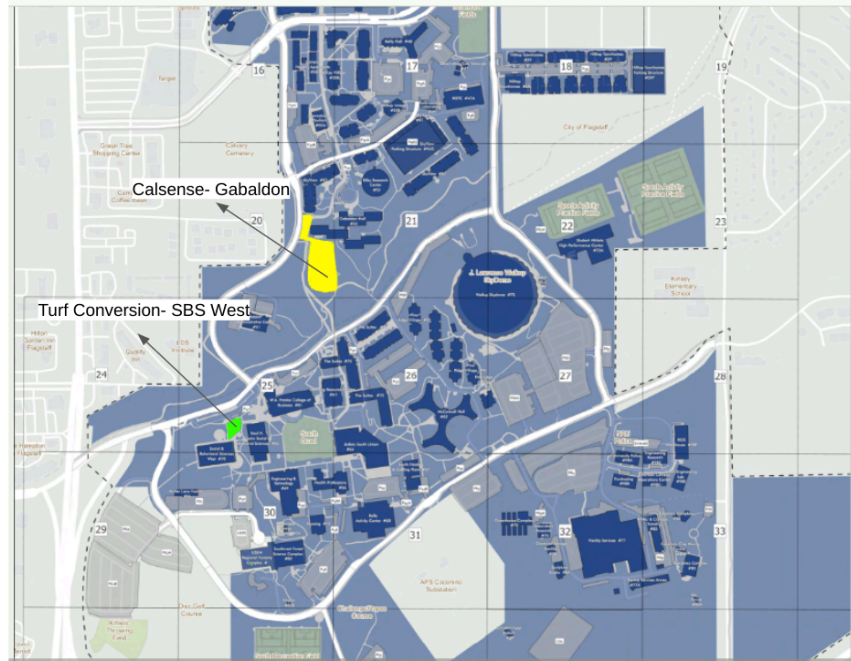
Actions & Parties Involved	Month/Year
Phase 4: Project Closeout	
Phase 4: Irrigation Controls Closeout	April 2025
Phase 4: Landscape Construction Closeout	September 2025
Phase 4: Project Closeout and Completion	October 2026
Phase 4: Landscape Construction Warranty	September 2025 to August 2027

Anticipated Date of Completion	Phase 4: Fall 2026
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Maps: North & South Campus





Project Completion Checklist

Please complete all of the following items before submitting an application

- Contact Information
- Project Overview
- Project Budget
- Project Timeline
- Obtain **ALL** necessary letters of support for reimbursement, ongoing maintenance, student wages, etc. Attach the letters of support to the completed application.
- Submit the completed application to GreenFund@nau.edu

Thank you for your submission. We deeply appreciate your commitment to sustainability at NAU, and we look forward to working with you.