



Photo by *Rolf Hagberg*

Building Analysis & Adaptive Reuse Plan *for* **Halfway Ranger Station**

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1.0 Introduction

1.1 Purpose of report

Halfway Ranger Station, situated on the southeastern corner of the junction of the South Kawishiwi River and MN Hwy 1, is currently managed by the USDA Forest Service Northern Research Station (NRS). Northern Bedrock Historic Preservation Corps (Northern Bedrock) intends to rehabilitate Halfway Ranger Station (HRS) to be adaptively reused for conservation corps programming. This will include training, corps orientation, recreation, and other organizational programming for fundraising and planning. Plans are to begin with seasonal use and ultimately include year-round facilities.

In the beginning, the site will serve 5-15 people in a primitive camping environment. As each building becomes usable, additional facilities will be integrated into use by the organization. Once HRS is completely rehabilitated, it will provide year-round facilities for up to 50 people. This report details the work required to realize Northern Bedrock's vision while preserving the historic features of the site. This report demonstrates that it is feasible for HRS to be adaptively reused to suit the needs of Northern Bedrock. With this report, Northern Bedrock looks to enter a Participating Agreement with NRS for the site. This is a preliminary planning document only. It is not intended to be the final detailed rehabilitation plans.

1.2 Rehabilitation timeline

The work plan is presented in three phases: stabilization, rehabilitation, and final build-out. The site and buildings will undergo various levels of rehabilitation during each phase. Each phase presents additional building and site requirements for conservation corps programming and the corresponding rehabilitation work to be completed. The plan provides steps within each phase so that the project can be developed building by building. This approach allows for work to progress as money becomes available.

The work sequence, which includes requirements for winter use, allows for increasingly intensive use of the site. The priority will be to allow Northern Bedrock to utilize the site for programming as soon as possible. Thus the organization will be able to use the property shortly after receiving a Participating Agreement, instead of waiting until enough funding has been raised to complete all of phase I (or even the entire rehabilitation project).

The HRS site is complex, so remediation levels and details will undoubtedly change during the time it takes to upgrade the facility through phase III, when the site will be suitable for winter use of 30 people and summer use of 50 people. This report presents one possible scenario.

1.3 Building references

This report retains the historic names for the buildings with the exception of the two offices and the ranger dwelling. The district office is referred to "wolf cabin," from the time it was used as a dwelling for mammal studies; the office/bunkhouse is simply

“bunkhouse”; and the ranger dwelling is “ranger cabin.” During phase III, the laboratory and insectary will be renamed for to reflect the adaptive reuse of these buildings.

1.4 Order of buildings within each phase

The following list is ordered by suitability for use with minimal work, figuring in location, condition, and amount of work needed to make the building usable (e.g., the garage needs minimal clean-up to be used for storage). The order and building numbers shown here will be used throughout.

1. Garage
2. Oil House
3. Outhouse
4. Boat House
5. Pump House
6. Ranger Cabin (Ranger Dwelling)
7. Bunkhouse (Office/Bunkhouse)
8. Wolf Cabin
9. Laboratory (Phase III – Mess Hall)
10. Insectary (Phase III – Kitchen and Restrooms)
11. Root Cellar
12. Outhouse/Sauna
13. Yurts
14. Temporary Kitchen Trailer
15. Temporary Shower House

1.5 Compliance with historic preservation and Section 106 standards

The historically significant period for the site is from 1931 through 1961, when it was associated with the Civilian Conservation Corps, the US Forest Service, and the Lake States Forest Experimental Station. The region is also known for the presence of American Indian artifacts and even some prehistoric artifacts. The site has had major 20th century disturbances, ranging from the presence of other structures and their demolition to septic systems and underground water and sewer.

The intent of Northern Bedrock is to maintain as much integrity of the structures as feasible while converting the site to a conservation corps base. The insectary is the only building on site that cannot be adaptively reused in its current state. The insectary is a minimally constructed 1950's garage type structure that will require major structural improvements as well as lead remediation of the entire exterior finish. Northern Bedrock will work with a historic preservation professional and SHPO to determine the ability to rehabilitate the insectary prior to considering demolition. If rehabilitation is not feasible, the compatible new building design will be coordinated with SHPO. Throughout this report, it is planned for the demolition and reconstruction of the insectary.

The rest of the buildings are to be modified on the insides only, retaining the original exterior appearances in all cases. Where the interiors have distinguishing features (e.g., the stonework fireplace in the ranger cabin), no visual changes are planned.

Ultimately, some of the unique features of HRS will be restored, including the curved log posts on the wolf cabin whenever the logs are located, the herringbone-patterned carriage and man doors on the garage building, and the half-log fascia and trim on the wolf cabin and oil house.

All work on the buildings will be coordinated with a historic preservation professional to ensure that the rehabilitation work is consistent with the accepted standards for the treatment of historic properties as delineated in *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings* (Weeks and Grimmer, 1995). Because the site and buildings are owned by a federal entity, all work must also comply with Section 106 of the National Historic Preservation Act of 1966 for historic archeology and historic building purposes.

Most of the log buildings have powder post beetles in the logs. The ranger cabin has been heated in the winter and shows little, if any infestation. The rest of the log buildings have various degrees of major infestation. The wolf cabin is the worst, due to being tightly closed up and not ventilated, particularly in the summer. NRS has attempted remediation with the least invasive method of spraying borate on the exterior of the logs. An inspection by Leone Graff and Northern Bedrock in August of 2012, one year after application, showed that the infestation is still extremely active.

Northern Bedrock will involve a historic preservation professional in planning for all work. SHPO will be consulted for aid in creating a Programmatic Agreement for building rehabilitation work, site improvements, and in creating an archeological plan for all digging on site. Northern Bedrock recognizes and accepts its responsibility for preserving the history of the site above and below ground.

2.0 General Comments and Assumptions

2.1 Safety improvements

Life safety improvements will have to be made to all occupied structures before Northern Bedrock can use them for housing or programming. Fire alarm and smoke detector systems will be added to the garage, ranger cabin, boat house, bunkhouse, wolf cabin, and laboratory as they are individually readied for occupancy. Carbon monoxide detectors will be installed where required. All safety hazards, including deteriorated steps and unsafe equipment and power supplies, will be dealt with to ensure the safety of the occupants and visitors of the site.

2.2 Hazardous material remediation

NRS has provided Northern Bedrock with a partial listing of the known hazardous materials found on the site. During phase I, a comprehensive survey will be conducted to ensure that all of the hazardous materials are identified and a final remediation plan is in place for later construction. The remediation of the hazardous materials, including but not limited to asbestos and lead paint, will also be accomplished in each building prior to occupancy within the appropriate phase.

2.3 Compliance with the Americans with Disabilities Act

Accessibility will be dealt with on a building-by-building basis. The main entrance doors to the garage, ranger cabin, bunkhouse, and laboratory (mess hall) have 36" doors; the wolf cabin entrance is 34". These doors all meet entrance door size requirements. For the purpose of this report, ramps will be added to the ranger cabin, bunkhouse, and laboratory during preparation for occupancy of each building.

Accessibility to the interior of the ranger cabin is currently limited to the screen porch and the living room. The possibility of creating main floor interior access to the kitchen, bathroom, and bedrooms is discussed in phase I. The attic and basement are not accessible and is not addressed in this plan. The wolf cabin meets the accessibility requirements to enter, but the bedroom and closet doors will need modification.

SHPO and NRS will be consulted for advice on applying the Americans with Disability Act to registered historic structures.

3.0 Summary of Work by Phase and Building

Cost estimates have been made for the actual work involved. These estimates will be found in Appendix B listed by phase. The estimates are broad numbers based on prior experience, discussions with contractors, and recognized national estimating manuals. Obviously, some costs will vary depending on possible options for use of buildings and the timing of the rehabilitation work. It would be very easy for Northern Bedrock to just start in and waste labor or materials by not sequencing properly or planning well.

3.1 PHASE I: Stabilization

During this initial phase, the site will be made safe. Both the buildings and the site itself will be brought up to a minimum standard of safety or barricaded. The site will be made usable for a small group of staff and nonresidential work crews in a primitive camp setting. It is also the intent during this phase to complete work that will prevent further deterioration of the buildings.

3.2 PHASE II: Rehabilitation

During phase II, rehabilitation of some buildings will take place, and the site will be made usable for groups of up to 30 people.

3.3 PHASE III: Final Build-out

During phase III, rehabilitation will continue. In this phase, the laboratory will be adaptively reused as a mess hall and the insectary will be converted into a restroom/shower facility and commercial kitchen. As stated prior, a historic preservation professional and SHPO will be consulted to determine the ability to rehabilitate the insectary prior to considering demolition. Throughout this report, it is planned for the demolition and reconstruction of the insectary.

Also in this phase, some buildings will be winterized and the site will be made usable for up to 50 people in the summer and 30 in the winter.

3.4 Work Summary

The following work summary table identifies the rehabilitation work of the site and each building in the three phases as mentioned above. See Appendix A for a more detailed explanation of the rehabilitation work.

3.5 Site Usage Plan

The core needs of Northern Bedrock for a conservation corps base site are to be able to feed, sleep, and provide restrooms for the number of participants utilizing the facility at any given time. HRS does not meet these needs initially; therefore, Northern Bedrock has identified temporary solutions; such as satellite toilets, a kitchen trailer, and yurts, to accommodate these needs until phase III is complete. With these temporary solutions in place, HRS meets the needs of Northern Bedrock. After phase III is complete, HRS fully meets the needs of Northern Bedrock and only two structures have an undetermined use, the root cellar and the outhouse/sauna. These structures will still be preserved if possible. A table illustrating the usage plan for the site follows the work summary table.

Site / Building	Phase I	Phase II	Phase III
Site	<ul style="list-style-type: none"> · Inspect electrical · Inspect and test water supply · Inspect sewage system · Inspect entire site for hazardous materials · Install entrance sign · Install pit toilets or supply satellite toilets · Brush recreation area 	<ul style="list-style-type: none"> · Parking area delineation · Upgrade site electrical service · Building electrical service entrances and wiring · Upgrade site lighting · Septic system upgrades to provide for phase II and III plumbing needs · Remove and replace sidewalks · Building signage 	<ul style="list-style-type: none"> · Improve drive surfaces · Walkway additions
#1 Garage	<ul style="list-style-type: none"> · Install electric panel, service and check devices · Install smoke alarm, fire alarm, and carbon monoxide detector · Inspect log structural · Install borate rods in lower logs · Install roof vent · Clean up 	<ul style="list-style-type: none"> · Install new insulated roof · Remove and replace shingles · Install fascia · Stain exterior · Caulk · Install additional power outlets 	<ul style="list-style-type: none"> · Repair foundation · Remove and replace concrete floor · Electrical improvements · Lighting improvements · Add utility sink and piping · Upgrade heating system · Insulate and finish exposed inside of foundation wall · Install man door in log dividing wall · Ventilation fan for work area · Replace original herringbone carriage doors · Replace original herringbone man doors

Site / Building	Phase I	Phase II	Phase III
#1 Garage (cont.)			<ul style="list-style-type: none"> · Install storms and screens
#2 Oil house	<ul style="list-style-type: none"> · Clean up · Install borate rods in lower logs · Modify shelving 	<ul style="list-style-type: none"> · Stain exterior · Remove and replace shingles · Replace original half-log fascia 	<ul style="list-style-type: none"> · Replace sliding window · Restore herringbone door
#3 Outhouse	<ul style="list-style-type: none"> · Clean up 	<ul style="list-style-type: none"> · Stain exterior 	<ul style="list-style-type: none"> · No work
#4 Boat house	<ul style="list-style-type: none"> · Install permanent ventilation · Install borate rods · Clean up · Smoke alarm, fire alarm, and CO detector 	<ul style="list-style-type: none"> · Stain exterior · Remove and replace shingles · New fascia 	<ul style="list-style-type: none"> · Repair foundations · Remove & replace concrete floor · Restore sliding door · Replace dock
#5 Pump house	<ul style="list-style-type: none"> · Remove plywood on interior walls and batt insulation · Provide ventilation · Install borate rods · Install new power line · Test water · Install new pump · Clean up 	<ul style="list-style-type: none"> · Stain exterior · Caulk · Remove and replace shingles · New fascia · Insulate roof · Install winter ventilation 	<ul style="list-style-type: none"> · No work
#6 Ranger cabin	<ul style="list-style-type: none"> · Remove vermin-infested insulation and seal entrance holes · Inspect heating system · Clean fireplace chimney · Inspect electrical system and repair 	<ul style="list-style-type: none"> · Insulate attic · Replace 2nd floor ceiling · Roof vents · Caulk 	<ul style="list-style-type: none"> · New furnace · Remove and replace shingles · Stain exterior · Caulk

	Phase I	Phase II	Phase III
#6 Ranger cabin (cont.)	deficiencies <ul style="list-style-type: none"> · Install fire and smoke alarms, CO detectors · Repair chimney exterior · Install new wood screens throughout · Inspect fireplace and chimney · R & R floor tile · Remove 2nd floor ceiling · Remove dormer paneling · R & R basement drain pipe to septic tank · Install new low-water-usage toilets · Prep and paint basement walls in lav and shower areas · Repair or replace basement drain · Bath ceiling and wall FRP panels · Install accessibility ramp and front porch with railings · Install 2nd basement egress – Window · Remove trash · Demolish non-load-bearing walls · Install new stud walls · Install plumbing for 3-fixture bathroom · Install drywall on studs · Install drywall on ceilings · Half-log siding for hallway 		

Site / Building	Phase I	Phase II	Phase III
#6 Ranger cabin (cont.)	<ul style="list-style-type: none"> · Bath electrical including ventilation fan · Hygienist and hazardous mat'l disposal · Clean up 		
#7 Bunkhouse	<ul style="list-style-type: none"> · Inspect heating system · Install smoke alarm, fire alarm, and CO detector · Remove insulation · Screen vermin holes · Ensure proper attic venting · Clean interior 	<ul style="list-style-type: none"> · Demolish interior wall finish · Upgrade electrical system · New bathroom plumbing · Install new heating unit · Install drywall · Install accessible doors · Paint interior · Paint exterior · Install new screens and storms · Insulate attic and crawl space · Install ventilation fan in bath 	<ul style="list-style-type: none"> · No work
#8 Wolf cabin	<ul style="list-style-type: none"> · Ensure proper bldg ventilation · Remove and replace floor tile · Remove paint from window casings and repaint · Install borate rods · Install smoke alarm, fire alarm, and carbon monoxide detector · Clean up 	<ul style="list-style-type: none"> · Paint interior · Insulate roof · Remove and replace shingles · Replace original half-log fascia · Upgrade plumbing · Install sewage drain to septic system · Upgrade electrical system · Install heating unit 	<ul style="list-style-type: none"> · No work
# 9 Laboratory/ new mess hall	<ul style="list-style-type: none"> · Patch roof/repair flashing · Provide building ventilation 	<ul style="list-style-type: none"> · No work 	<ul style="list-style-type: none"> · Remove vermin-infested insulation · Insulate attic · Insulate crawl space

Site / Building	Phase I	Phase II	Phase III
# 9 Laboratory/ new mess hall (cont.)			<ul style="list-style-type: none"> · Remove and replace shingles · Remove and replace flooring · Upgrade electrical · Install fire and smoke alarms · Install CO detector · Install sink and piping · Upgrade heating system · Paint interior · Remove leaded exterior paint · Paint exterior · Accessibility ramp
# 10 Insectory/new kitchen building	<ul style="list-style-type: none"> · Demolish old screen porch floor · Support roof structure · Clean up 	<ul style="list-style-type: none"> · No work 	<ul style="list-style-type: none"> · Rehabilitate or demolish old structure · Construct kitchen/shower/restroom · Construct dogtrot between buildings
# 11 Root cellar	<ul style="list-style-type: none"> · Ensure proper ventilation · Secure from casual entrance 	<ul style="list-style-type: none"> · No work 	<ul style="list-style-type: none"> · No work
#12 Outhouse/ sauna	<ul style="list-style-type: none"> · Ensure proper ventilation · Secure from casual entrance · R&R shingles · Level and block building · Install borate rods 	<ul style="list-style-type: none"> · No work 	<ul style="list-style-type: none"> · No work
#13 Yurt	<ul style="list-style-type: none"> · 1 new yurt 	<ul style="list-style-type: none"> · 2 new yurts 	<ul style="list-style-type: none"> · 2 new yurts

Site / Building	Phase I	Phase II	Phase III
#13 Yurt (cont.)	<ul style="list-style-type: none"> · Platform · Deck and stairs · Create foot path 	<ul style="list-style-type: none"> · Platform · Deck and stairs 	<ul style="list-style-type: none"> · Platforms · Deck and stairs
#14 Temporary kitchen trailer	<ul style="list-style-type: none"> · No work 	<ul style="list-style-type: none"> · Install temporary kitchen trailer · Install trailer utility hookup 	<ul style="list-style-type: none"> · Remove trailer
#15 Temporary shower house	<ul style="list-style-type: none"> · No work 	<ul style="list-style-type: none"> · Install floor piers, framing and decking · Install walls with drywall one side and siding one side · Install screen wall · Install metal roof with rafters and sheathing · Install dressing area partitions with doors · Install exhaust fan · Install doors · Install lavatory · Install mirrors · Install lighting · Install shower units w/ plumbing · Install hot water heater with piping and hook-ups · Install sewer 	<ul style="list-style-type: none"> · Demolish structure

Site / Building	Phase I	Phase II	Phase III
HRS	Small groups <ul style="list-style-type: none"> • 5-15 people for staff, and board members for meetings, trainings, recreation for a few days to a week. • 5-15 people for crew base • Recreation • Spike camp location 	Medium sized groups <ul style="list-style-type: none"> • 10-25 people for staff and training 	Large groups <ul style="list-style-type: none"> • Summer corps programs
#1 Garage	<ul style="list-style-type: none"> • Storage and spike camp packing • Equipment maintenance (shop) • Training 	<ul style="list-style-type: none"> • Storage and spike camp packing • Equipment maintenance (shop) • Training 	<ul style="list-style-type: none"> • Storage and spike camp packing • Equipment maintenance (shop) • Training
#2 Oil house	<ul style="list-style-type: none"> • Storage 	<ul style="list-style-type: none"> • Storage 	<ul style="list-style-type: none"> • Storage
#3 Outhouse	<ul style="list-style-type: none"> • Outhouse 	<ul style="list-style-type: none"> • Outhouse 	<ul style="list-style-type: none"> • Outhouse
#4 Boathouse	<ul style="list-style-type: none"> • Canoe and accessory storage 	<ul style="list-style-type: none"> • Canoe and accessory storage 	<ul style="list-style-type: none"> • Canoe and accessory storage
#5 Pump house	<ul style="list-style-type: none"> • Pump house 	<ul style="list-style-type: none"> • Pump house 	<ul style="list-style-type: none"> • Pump house
#6 Ranger cabin	<ul style="list-style-type: none"> • Dormitory • Training • Staff cooking • Office 	<ul style="list-style-type: none"> • Dormitory • Training • Staff cooking • Office 	<ul style="list-style-type: none"> • Dormitory • Training • Staff cooking • Office
#7 Bunkhouse	<ul style="list-style-type: none"> • Dormitory 	<ul style="list-style-type: none"> • Dormitory 	<ul style="list-style-type: none"> • Dormitory
#8 Wolf cabin	<ul style="list-style-type: none"> • Dormitory 	<ul style="list-style-type: none"> • Dormitory 	<ul style="list-style-type: none"> • Dormitory
# 9 Laboratory/ new mess hall	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • Mess Hall

Site / Building	Phase I	Phase II	Phase III
# 10 Insectory/new kitchen building	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • Kitchen/Showers/Restrooms
# 11 Root cellar	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • No planned use
#12 Outhouse/sauna	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • Not used 	<ul style="list-style-type: none"> • No planned use
#13 Yurt	<ul style="list-style-type: none"> • Dormitory 	<ul style="list-style-type: none"> • Dormitory 	<ul style="list-style-type: none"> • Dormitory
#14 Temporary kitchen	<ul style="list-style-type: none"> • Not built 	<ul style="list-style-type: none"> • Meal Prep 	<ul style="list-style-type: none"> • Removed
#15 Temporary shower house	<ul style="list-style-type: none"> • Not built 	<ul style="list-style-type: none"> • Showers 	<ul style="list-style-type: none"> • Removed

4.0 Rehabilitation Costs

The rehabilitation costs for Northern Bedrock to completely build-out the site as presented above have been calculated by phase. Appendix A includes a detailed written description of the preliminary planned rehabilitation work. The detailed cost analysis can be found in Appendix B. These costs will vary depending on the final plans for the site and the specific details included. Many of the costs can be modified by substituting materials or methods, which may increase or decrease the projected values. The costs include materials, labor, contractor overhead and profit, project manager, and a 10 or 20% contingency. The abbreviations used within the cost analysis are as follows:

Abbreviation	Description
EA	Each
LF	Lineal sum
LS	Lump sum
SF	Square foot
SY	Square yard
R&R	Remove and Replace

The detailed costs for the furniture and equipment are listed by phase in Appendix C. The following summarizes the rehabilitation costs as presented.

Phase I – Infrastructure costs	\$171,988	
Phase I – Furniture and equipment costs	\$27,225	
Phase I Subtotal		\$199,213
Phase II – Infrastructure costs	\$401,639	
Phase II – Furniture and equipment costs	\$9,550	
Phase II Subtotal		\$411,189
Phase III – Infrastructure costs	\$505,608	
Phase III – Furniture and equipment costs	\$39,200	
Phase III Subtotal		\$544,808
<u>TOTAL REHABILITATION COSTS</u>		<u>\$1,155,210</u>

Appendix A - Detailed Descriptions of Individual Building Current Conditions and Work Plans

PHASE I - Stabilization

In this initial phase, the site will be brought up to a minimum standard to allow some use by Northern Bedrock and to stop or slow deterioration in the worst of the buildings.

Northern Bedrock's initial requirements are minimal i.e. Conservation Corp Minnesota & Iowa, under Brooke Tapp's management, ran a 20 corpsmember summer program from a storage garage in Grand Marais with a hose faucet for water, satellite toilet, and on site camping. Northern Bedrock's first summer of nonresidential programming will be run as a similarly bare-bones operation. The staff will live in a yurt, use camp stoves, pit or satellite toilets, and toss their gray water into the woods as campers in the BWCAW do now. Corpsmembers will sleep in tents and provide their own cooking as they would on spike camps. Note: Rolf Hagberg has been told by the Lake County Health Department that they like pit toilets.

As a conservation corps program base, the site will support 5-10 crews and house 2-5 staff. The crews work in the back country/front country and camp at the work site. HRS will be used for new corpsmember orientation, training, and some recreation. It will be a base camp for arriving and departing crews and a field-office space and shop facility during the summer. The garage will be used for indoor meeting space and the oil house, and possibly the boat house, for equipment storage. These buildings will require a minimal amount of work to get them into usable condition for these purposes.

As soon as site utilities are approved, additional services will become usable (e.g., the water supply after inspection and testing and the existing septic system after passing inspection or being upgraded).

The following provides detailed information on the items in the work summary table and the cost spreadsheets in Appendix B. It discusses the planned work on each structure to stabilize the buildings and to make some of them usable.

Overall Site

For this report, the site includes the electrical service, water supply and sewage systems, as well as the parking areas, walkways, dock, and site lighting. The electrical system will be inspected by a licensed electrician and site power supply restored to the garage and bunkhouse. A qualified inspector will evaluate the septic systems. The underground water pipe from the pump house to the ranger cabin and the bunkhouse was in service as of 2009 so it should be serviceable for the immediate future. A water sample will be taken and analyzed for potability.

As the work on buildings proceeds, the site manger should note all other deficiencies so they may be either dealt with immediately if severe or logged for future attention. The longer the site manager and possibly a project manager are on site, the more deficient items that need correction will become apparent.

Northern Bedrock will install an identifying sign near HWY 1 at the beginning of the entrance drive.

Two or more satellite or pit toilets, with one being accessible to people with disabilities, will be installed. They could possibly be situated near the oil shed, as shown on the 1965 site plan, across the road from the old trailer site and towards the insectary (this is not the same structure as the historic building #2, the oil house, near the garage.) Campers should be encouraged to use these to minimize the stress on the existing septic system until a permanent solution is provided in later phases.

Inspect entire site for hazardous materials. Due to its age, any paint presumably contains lead. This will have to be taken into account during the rehabilitation.

Brush an area to the north of the bunkhouse for recreation activities such as soccer.

Some of the log buildings have some foundation cracks. At this time, because a lower log spans the entire length or width of the buildings, and the building rooflines are still straight, this is not deemed to be a critical deficiency. The foundations and concrete floors in historically unheated buildings will be repaired in later phases as the floors are dealt with and the buildings are readied for final intended use.

1. Garage

This building is one of the most usable buildings as it stands. A small amount of cleaning will immediately provide a storage space/indoor training space and a workshop area. The building will have an intact updated electrical entrance panel installed and a supply from the main line. For some unknown reason, the panel has been disconnected and disassembled. As the building wiring is modern THW in conduit, an electrician will inspect it. The switches, outlets, and light fixture connections will also be inspected and any deficiencies corrected. Hardwired smoke and fire alarms will be installed. There is not a lot of power in this building and the initial needs of Northern Bedrock are modest. The roof is in fair condition and should be serviceable for a few years or more. All doors are functional.

NRS has stated that a possible structural problem with one door opening exists. This will be inspected by a log builder and repaired if deemed necessary. At this time, no major deformation of the log wall exists.

2. Oil house

The condition of this structure is similar to that of the garage. A small amount of clean-up and possibly a rearrangement of the shelving will make this structure usable for storage. There is minimal power. This building has been used for miscellaneous storage during the past 40 years and shows little if any oil spillage.

3. Outhouse

The outhouse behind the laboratory is in very usable condition, requiring just a minimal amount of cleaning. The Lake County Health Department may want this located farther from the small creek. It could be relocated or a new one built on the east side of the road leading from the garage to the insectary. This area will probably be used to build a mound for a future septic system in a later phase.

4. Boat house

The boat house, like the above three buildings, requires minimal work to make it usable. The main problem at present is the presence of powder post beetles in the logs. Part of the solution is to provide better ventilation.

[Note: A simple partial solution to this problem would be to open the windows during the summer when staff are present. Part of a better and more permanent solution would install a ridge vent on the roof. The structure, as well as all the other log structures, has had a solution of borate sprayed on the exterior of the logs in 2011 by NRS. This has not solved the problem. Although more invasive, the next step in the long-term solution would be to insert borate-based rods, such as Impel, in the lower logs to help get rid of the problem in the area where the dampness will always be the worst. An annual application of a sprayed-on borate to the exterior and to the interior will help prevent additional infestation. However, the rods contain a continuous, active non-toxic insecticide that dissolves and spreads throughout the log whenever the moisture content rises to a certain level, thereby dealing with the existing problem and not just preventing new infestations. The borate rods will also help protect the logs from rot.

Depending on the moisture content of the logs after the treatment, the rods will last for 8 or more years. If the logs dry out and remain under 20% moisture content, the rods will remain there forever. Insertion will require 7/8" holes drilled and plugged at regular intervals of approximately 12" along each log treated. These holes can be drilled from the outside and the plug cut flush, sanded, and stained to match the exterior finish. At this time, treating the lower two courses should be sufficient if the buildings are properly ventilated and the interiors dried out. Northern Bedrock will perform this work.]

5. Pump house

The pump house has been used within the past two years. A water supply will be critical, so this building must be put into service right away.

The insulation is mouse and/or bat-infested and will be removed.

Plywood presently covers the insulation, so the interior of the logs cannot breathe and dry out. This is especially true if the exterior has been stained and waterproofed, thereby trapping the moisture in the logs. This structure needs to be ventilated. It appears as though the vent in the roof has not been opened in some time. It will be opened in above-freezing weather. Most years, it could be opened from late April through September or longer. The building is small and tight enough that even a week of mildly freezing weather should not be a problem; however, the vent should be left open during early and late seasons only if someone is on site *and* monitoring the weather.

The roof will be insulated. Ceiling insulation is absolutely necessary for use in the winter.

[Note: An insulation system should be installed that will allow the opening of vents so the building can breathe in the summer. The best insulation method for this building would be to allow the 8–10" exterior logs to be uninsulated on the walls and install an R-40 or better insulated roof system. This roof is an excellent location for a sprayed-on insulation. Assuming that the roof structure is sound, application would be quick and provide a vapor barrier on the interior to prevent moisture from penetrating into the roofing system and rotting the sheathing.

This should be done only after the roof has been thoroughly inspected. If any of the sheathing is rotted, it needs to be replaced before spraying on the insulation. Exterior wall logs are normally not insulated in a log structure; the thermal qualities of log buildings are legendary as long as the joints are tight.]

The pump should be operable as soon as it has a power source and the water is tested. The current power line to the structure is not suitable; it is very old cloth-covered wiring with three separate wires running to the building. The age of the pump itself is unknown, so a possible pump replacement is allowed for in the cost estimate.

6. Ranger cabin

This building will require more work. The building has been used for some years with a severe bat infestation in the attic space, to the point of bats finding their way into the living spaces.

The building lacks fire and smoke alarms and carbon monoxide detectors. These will be installed before occupancy.

Septic/plumbing: This building has a newer mound-type septic system that has been documented as working within the past several years. It was installed in the early 90's, and since the facility has been minimally used for many years, the septic system has not had lots of use. This would be a good time to install a new

water-conserving toilet in the bathroom(s) to minimize the amount of water running through the mound system no matter what plans are for this structure. This will keep the septic system serviceable for a longer time and not use as much water from the well.

[Note: As soon as toilet facilities are in use, a note should be posted in all bathrooms that informs users of proper septic usage (e.g., no flushing of feminine products, garbage, cigarettes, etc.). Most urbanites are not aware of the problems caused by flushing improper items down a septic system. This is one of the most damaging things that can be done to a septic system.]

The building has one functioning toilet, a bathtub, a lavatory, and a kitchen sink. The basement showers reportedly have drain problems. As this could be anything from a plugged drain to a collapsed drainpipe, all the basement plumbing is questionable. Only a thorough plumbing inspection will determine what the issue is. An allowance is made for drain work in the basement.

Furnace: During the most recent inspection by Northern Bedrock, on 12/7/12, the building had the heat on, so the oil furnace is functional.

Kitchen: The possibility of upgrading the kitchen of the ranger cabin to a commercial kitchen has been investigated and is limited. The log walls and the large casement windows on the screen-porch side are problematic, and the space would be very cramped. Some supplies would have to be stored in the living area as well as the refrigerator and the freezer. The log walls and the wood-paneled ceiling would have to be furred out, dry-walled, and paneled with FRP for a commercial kitchen. Major plumbing, electrical, and ventilation modifications would have to be made. This was deemed unacceptable, resulting in the commercial kitchen being moved to phase II. The current kitchen will be upgraded to a residential kitchen for staff use only.

Electrical: In addition to a full electrical inspection with any deficiencies corrected, the life/safety issues will be addressed. Appropriate hardwired smoke and fire detectors will be installed. Carbon monoxide detectors will also be installed where required.

Basement egress: If the basement is to be used as a shower and restroom facility, as it is currently, a second means of egress will have to be installed. A possible solution would be to enlarge one existing glass block window to the appropriate size by cutting a larger opening in the concrete wall around it, installing an egress window, and deepening the existing window well. Another possible solution would be to enlarge the window further and install a door with exterior stairs as egress.

The paint on the shower walls will have to be encapsulated or removed as it does contain lead, per a report from NRS.

Rodent infestation: Bats have found access to the interior of the building. At this time the NRS has started eliminating their access, with unknown success. The second floor, which was described in the National Register of Historic Places Registration Form as the attic, has “cubbyholes,” accessible spaces under the roof in which the ceiling height is too low to be used as living space. These cubbyholes all have access doors and no interior finishes. Fiberglass batt insulation has been placed in the cubbyholes on the unfinished backsides of the living space walls between studs and has been laid on the floor, which is the first-floor living area ceiling. This insulation is now both blocking inspection for bat/mouse access and is permeated with mouse urine and feces. This will need to be removed and the area cleaned thoroughly and checked for bat and mouse entrance holes. These entrance holes will then be closed up or screened to allow ventilation.

[Note: Bats can enter an opening as small as $\frac{1}{4}$ ", so if ventilation is required through an opening, $\frac{1}{4}$ " hardware cloth should be the largest screen material used. Standard window screen material is often torn apart by mice and other small vermin and is not suitable for permanent blocking.]

[Precaution: Mouse and bat feces can contain various viruses and bacteria. Anyone cleaning these areas should be protected from both inhalation and bodily contact. This also means that in addition to an appropriate respirator and gloves, the insulation should be bagged before removal from the building. The areas should then be vacuumed with a HEPA vacuum and washed with a bleach solution or other approved sanitizing solutions. The entire area through which the bags must be carried to the dumpster should be protected with plastic during the removal and clean-up stage, and the rest of the building sealed off. Any clothing that is exposed during this process should be removed and sanitized before wearing again.]

The second-floor ceiling appears to be beaded $\frac{1}{2}$ "- wainscot paneling. It was applied directly to the underside of the rafters. The space between the roof sheathing and the paneling has housed bats, and urine has dripped down from the cracks between the ceiling boards. This area needs investigation. More than likely, the ceiling boards will have to be replaced. The unfinished surface on the top of the boards will have allowed the urine to soak into the wood. Without removal, it will be impossible to clean the wood, and even if it were possible, the urine smell would probably still remain.

A similar problem may also be involved on the dormer exterior wall and ceiling. Bat urine has been running down the window. Only a thorough investigation, including opening the wall and ceiling, will determine the extent of the problem. For purposes of this study, it will be assumed that the solution is to remove the paneling on the ceiling and on the exterior wall of the dormer and to replace it in a later phase.

[Note: Since Northern Bedrock plans winter use for this building, the insulation should not be replaced until it can be properly re-insulated and protected from moisture. Many old buildings have developed mold due to improper insulation techniques. To insulate the space prematurely will cause a duplication of labor and waste of materials.]

It would be possible to lock the entrance door to the second floor/attic and not use the space until some remediation has been accomplished. The old insulation, however, will be removed right away to facilitate the blocking of all bat/mouse entrance holes as well as to remove the majority of the urine-soaked materials, which constitute a severe health hazard.

[Note: This space should be re-insulated before using the building in the winter. There have been reports of severe ice dams on the roof in the 90's before the insulation was installed.]

Asbestos tile: The tile on the floors is old and worn; the tile in the living room has a hole. The presence of asbestos in this flooring has been verified. Although no pieces appear to be coming off, the worn-through spot in the middle of the living room floor is a problem. As it continues to wear, small quantities of asbestos dust will be released. The tile will be removed and replaced. The bedrooms have the same floor tile, which will also be removed. The bathroom and kitchen have more recent sheet-vinyl flooring, which although not in great shape, could be left for later phases. The floor was originally exposed wood and could possibly be restored.

Americans with Disabilities Act compliance: The front entrance door is a 36"-wide door. The existing interior doors range from the bathroom, at 30", to the bedrooms, at 32". Northern Bedrock will have to work with the local zoning authorities to use this building as is, with a ramp to the front door, until the remodel of the inside is complete. In future phases, full access will be provided to the buildings, including the new kitchen, mess hall, bunkhouse, the new yurts, and a combination kitchen/shower/restroom facility.

If handicap access is deemed necessary right away, a phase I alternative involves rearranging some or all of the half-log-sided, non-bearing stud walls that divide the living space on the east side of the building and widening the door through the log dividing-wall running the length of the building. This area currently contains two bedrooms, the bath, three small closets, and a linen closet. The bath has an old 4' tub; because of the window location, a shower cannot be installed. The log ceiling joists run perpendicular to the log-dividing wall, so the partitions are not load bearing. This means the bathroom could be remodeled, allowing for a layout that accommodates both an accessible bathroom and a shower in place of the original bathtub. The hallway could be widened and 36"-wide doors installed for the bedrooms and the bathroom. The

door into the kitchen would also be widened in this plan. This building could then be used as an accessible living space for staff or visitors. The costs for this alternative have been included for planning purposes.

The steps to the front sitting porch will be rebuilt and modified to allow for a ramp and handrails on the entry steps. Because the building has shifted slightly over the years, the screen door does not open and close properly. It will be modified to fit the opening.

Screen replacement: There are currently no screens in the door or the openings in the screen porch and no screens for the rest of the windows. Due to the prolific mosquito population in northern Minnesota, it's important that these screens be replaced at this time. Doing so will make this large sitting porch into a place for meeting and relaxing. It could also be used as a summer dining area.

Stonework: After a thorough cleaning, the fireplace and chimney will be inspected by a mason to ensure its suitability for use. Installation of a fireplace insert is a possibility, although because it has a very low opening, there will be some limitation on inserts available. The exterior of the chimney will be repaired.

7. Bunkhouse

This building also has a rodent problem in the cubbyhole area of the second floor and in the crawl space. As in the ranger cabin, the insulation on the walls of the living space in the second floor facing the cubbyholes will be removed and all holes that allow mice and bats access will be closed up. When the access to the rafter space over the ceiling is inspected, it will be determined whether the finish ceiling in the second floor needs to be removed due to mice/bats. The ceiling is some kind of hard board and does not show signs of mice/bat urine. It probably is not insulated. The paint is in good shape. The second floor will most likely have to be gutted during later phases due to its age and the probability of lead paint on walls and ceiling. The roof will be properly vented at that time.

The crawl space also has a rodent problem. Again, the insulation will be removed and all access holes for mice should be eliminated. This will also allow access for electrical and plumbing upgrades to be easily accomplished. This could be an excellent location to have the underside of the floor insulated in a later phase with a sprayed-on insulation after all the electrical and plumbing upgrades are accomplished in later phases.

The mechanical and electrical systems have been used in the past few years. Appropriate hardwired smoke and fire detectors will be installed. Carbon monoxide detectors will also be installed where required. The only major deficiency seen is the septic system. The kitchen and bathroom should not be used in this phase, as the sewage system has been a problem for NRS for some time. The building could be used without plumbing during the initial phase. In a later phase it will be hooked up to the new septic system that will be installed.

The three-step entrance porch of this building will be replaced on the riverside before using. It is currently a hazard, as the treads have failed because of severe rot. The waterfront is generally considered the front of a building, so this entry currently has a 36"-wide door. A ramp will be built on the south side of the building, ending at an extension to the new entry porch for access to the front entrance. In future phases, up to two bedrooms and the bathroom will be made accessible. The bathroom will contain accessible showers, lavatory, and toilet.

8. Wolf cabin

This is a more complex building to deal with. It may be a small building, but it has deteriorated a bit more than the others. It has not been used in recent years and the perpetual dampness has caused problems. The logs are heavily infested with powder post beetles. The building needs to be ventilated well during all seasons. Borate rods will be inserted into the logs. The backside will have the hillside dug out a little or at least kept clear to keep the dirt and leaves from contacting the wood siding on the bathroom addition.

The old deteriorated floor tile in the bedroom and bathroom will be replaced. According to NRS files it does not contain asbestos. Some of the window casings have alligatored paint; it is probably leaded and will be removed. The sewers presumably went to some type of cistern system, which is not acceptable. In a later phase, it may be possible to install a pump system to direct sewage into the mound system for the ranger cabin. Once the cabin is cleaned and any hazardous materials dealt with, it can be used without plumbing.

This building does not have an insulated roof. It could be used minimally in the winter, as it undoubtedly has been, but not extensively until a suitable insulated roof system is installed. If used in winter, moisture builds up under the shingles and the tarpaper cannot vent and will eventually rot the roof sheathing. Ice dams will also build up on the roof eaves and cause water damage.

9. Laboratory

The leaks in the roof of the laboratory will be repaired immediately upon assumption of control of the property. The roof has been leaking near the chimney, which has resulted in water damage to the ceiling and the floor. The ceiling is actually falling down due to this leakage. During an inspection last August with Northern Bedrock personnel, water was dripping from the ceiling, even though it had been a fairly dry summer. Due to this damage and mouse infestation in the attic and the crawl space, this building will not be used until a later phase.

The building needs good year-round ventilation to prevent further damage from dampness. Six or more 12"x12" rainproof vents (or equivalent) will be installed in window openings on different exposures. At least an equal square footage of roof vents will also be installed. The collapsed ceiling with an opening in the insulation

batts will allow enough air to escape into the roof structure to ensure ventilation and vent through the roof.

10. Insectary

This building has a screen porch with a rotted floor that needs either to be removed and posts placed on the foundation piers to support the roof structure or the floor and exterior walls repaired. The access to a room at the back is through the screen porch. A rotted two-step porch, which gives access to the screen porch, will be removed. As it stands now, it is an inviting hazard for people to investigate. After consultation with SHPO and other interested organizations, it may be determined that it is best to demolish this building instead of putting money into it. Later phases use this site for a kitchen/shower house/restroom combination building.

The garage portion of this structure itself could be used for storage with a little cleaning. The interior stairway to the storage area over the screen porch and the back room needs to be strengthened and have better railings or to be removed. It is way too enticing for someone to use it. The storage area in the attic is in good condition.

11. Root cellar

The cellar will be cleaned out and ventilation ensured with a new screened opening at the door and the upper vent verified to be open or opened. The entrance will be barricaded to prevent access until a use presents itself. To hold up better to small animals and inquisitive people, the screened barricade over the door opening will be of something like ¼" hardware cloth rather than insect screen. The structure appears to be sound; however, it will be inspected thoroughly before use as it is made of concrete and covered with a substantial volume of dirt.

12. Outhouse/Sauna

This is one building that should be inspected carefully before putting any money or work into. In consultation with SHPO, it may be determined that it is too far-gone to salvage. In this case, the structure should be documented and then demolished for the sake of safety.

If the decision is to attempt to salvage it, the structure must be vented during the stabilization phase. It should be leveled and blocks used to support it. New shingles should be installed. Borate rods should be inserted into in all logs. The structure should be closed off to ensure that no one enters it. This would include removing the door, which does not close; placing plywood with a vent over the opening; removing the stove; and placing a plywood barricade with a vent over the hole in the side to prevent access. Its remote location encourages trespass and will have to be monitored to ensure the barricades stay in place.

13. Yurt

One 20' yurt will be built for staff housing while the ranger cabin is being worked on. The yurt will become corpsmember housing after the ranger cabin is updated.

14. Temporary Kitchen Trailer

No work

15. Temporary Shower House

No work

PHASE II – Rehabilitation

In this phase, Northern Bedrock will start transforming the site into a full-service summer camp for medium-sized groups. Small groups will have minimal winter usage.

Major upgrades will be made to the main electric service line. Where needed, electric service entrances will be upgraded in the buildings to be brought on line in this phase.

Signage on the buildings will be added to help the constantly changing groups identify their location and provide a sense of place.

Any of the immediate problems found with the heating system inspections from phase I would be dealt with, as will the insulation of key buildings. The sewer systems will be brought up to code.

All log buildings will be washed and stained unless the existing finish is adequate. The joints between the logs in heated buildings should be thoroughly inspected for gaps. These should be sealed with a good elastomeric caulk of the proper color, such as Big Stretch (brown), and the joint tooled for a nice finish.

Overall Site

All site electrical that was not improved during phase I will be improved during this phase. This will include the main power supply, building service entrances, and site lighting.

The cement sidewalk to the ranger cabin from the parking area will be removed and replaced.

Parking areas will be delineated.

A window restoration program will be instituted to restore and reglaze the windows in all the buildings. This should be an ongoing maintenance program, beginning with the worst windows and continuing until all have been restored. They do not all have to be restored at once, nor do all windows within a building have to be done at the same time. This could be a project for the crews working Northern Bedrock programs.

At this time, a septic system will have to be built that can accommodate the increased use of the site through phase III.

1. Garage

Wash and stain exterior. If there are any gaps in the joints between the logs, these should be sealed with a good elastomeric caulk of the proper color, such as Big Stretch (brown), and the joint tooled for a nice finish.

The cracks in the west foundation wall and the lower log joint with the foundation should be caulked if the building is to be heated in the winter.

The garage roof needs to be insulated for preservation programs to use this building as a workshop in the winter. The interior of the structural system is part of the important historic detail of the building and would be best left exposed. The easiest way to accomplish this would be with insulated structural panels. The roof thickness will have to be increased; the new thickness will require the fascia to be something close to 9", a little over double what the original fascia was. New shingles and fascia will be installed.

2. Oil House

This is a very simple building. New shingles will be installed on the roof. The original half-logs used for the fascia will be replaced. The exterior will be washed and stained. The screens were removed at some time. These will be installed to bring the building back to its original appearance.

3. Outhouse

This is a very basic building that will be washed and stained inside and out.

4. Boat house

The one room building will get new shingles and fascia. It will be washed and stained.

5. Pump house

This building should have the old shingles removed and the roof sheathing inspected for deterioration. After the integrity of the roof sheathing is ensured, this building should have a sprayed-on insulation installed, to at least an R40, in the roof. Moisture is likely to be present in this building; the foam would create a desirable vapor barrier for the roof system. Any other insulation system would thicken the roof and increase the size of the fascia to at least 9" instead of the original 3 $\frac{7}{8}$ " actual dimension of the 1x4 that was used. This solution would keep the exterior consistent with the historical dimensions. New shingles will be installed.

The structure will need a fan system to periodically change the air during the winter. A simple bathroom exhaust fan on a timer set to run for 10 minutes several times a day would be sufficient; a shutter open only during venting would be necessary. Since the building is log on all four sides and has no windows, and the original door is substantial, the vent might be a pipe through the roof extending to the floor. This would allow the warmer, moister air at the ceiling to rise through the existing and opened roof vent with the replacement air being drawn in down to the floor level, a system that would work in both summer and winter. It would ensure a stirring of the air in the structure and good ventilation during the warmer months.

There may be enough air infiltration to support the winter exhaust fan. If so, the new air-supply duct could be closed (or at least partially closed) in the winter. The additional air supply on the roof would be a minimal change to the structure. The interior of the log walls should be left uncovered to allow the logs to breathe and dry out. Log buildings are not normally insulated on the exterior walls. They are thermally efficient by themselves if the joints are tight.

Make sure that this door is tight fitting and well weather-stripped. Use the original door. This will help maintain the historic integrity of the building.

Wash and stain exterior. If there are any gaps in the joints between the logs, these should be sealed with a good elastomeric caulk of the proper color, such as Big Stretch (brown), and the joint tooled for a nice finish. This remediation applies as well to gaps left after removal of deteriorated caulk at all fenestration.

6. Ranger cabin

During the early part of this phase II, the program will center on this building. The building will be used in the winter, so it needs to be adequately insulated. The cubbyholes on both sides of the living space on the second floor/attic need to be insulated. This would be another good location for sprayed-on insulation on the exterior of the living space walls and the floor (ceiling of the first floor). The foam cannot be allowed to penetrate any gaps between the boards of the paneling into the interior of the second floor. It should not show from the living space.

Depending on what was done in phase I with the ceiling over the second-floor living space, the ceiling could have insulation sprayed on or rigid foam and a vapor barrier installed. If the ceiling boards have been removed, access to the rafters and the roof sheathing has already been acquired. This will allow the roof and attic spaces of the building to be insulated with a spray-on product without changing the ceiling thickness (which would result in reduced headroom) and a warm roof with an excellent vapor barrier. Ensure proper ventilation of the cubbyholes space with additional vents to the roof or the end walls. Standard, square, roof vents as opposed to end wall vents are great in the summer, but during the winter in Ely, enough snow will build up on a well-insulated roof to cover and block the roof vents.

The concrete basement wall insulation should be dealt with later, after the usage of the basement is finalized. This is an area where it would be easy to get ahead of the project and install insulation to try to save on heating bills, only to have to change it later. Whenever these walls are insulated, the job should be done carefully, so that moisture traveling from the exterior of the walls does not build up within the insulation and allow mold to grow.

The exterior finish is in good shape at this time. If there are any gaps in the joints between the logs, only these gaps should be sealed with a good elastomeric

caulk of the proper color, such as Big Stretch (brown), and the joint tooled for a nice finish. This both weatherizes and keeps mice/bats out. Remove any deteriorated caulk at all fenestration and treat the gaps the same way.

7. Bunkhouse

During phase II, this building will be converted to a winterized facility accessible to people with disabilities. The original riverside door is 36". The doors to the current kitchen, bedroom, and bath vary between 28" and 30". They will be replaced with 36" five-panel doors similar to the existing ones. The kitchen will be converted into a second accessible bedroom. The current entry doors are not the originals. Replacements for them will be matched to those in historic photos or, if photos are unavailable, doors consistent with the time period.

The current bath/lavatory is two separate rooms. One lavatory is separated from the shower, urinal, toilet, and a second lavatory. The toilet area also contains the hot water heater and the oil-fired furnace. If this entire area were modified, an accessible shower, toilet, and sink could probably be installed.

An upgraded heating system should be installed. This building could easily be heated with a modern decorative propane stove and a baseboard electric heater on a timer in the bathroom to augment the stove and make the space more comfortable for bathing in winter. The stove could be located to take advantage of the cubbyhole space to run the combined fresh air intake and vent through to the roof or through an exterior wall.

The large room in the center could be used either as a bunkroom for 4 people or a smaller indoor meeting location and an inclement weather mess hall for 8-12 people until the new mess hall is completed.

During the reconstruction of the bathroom, the exterior walls should be explored to determine whether they are insulated. If not, insulation could be blown in from the inside. Most of the walls, which appear to be some kind of sheet material, are not in great condition, and the joints are not finished well. The interior walls could be resurfaced with either a fabric wall covering to recondition them or drywall. If it is determined that the interior wallboard needs to be removed, either fiberglass batt and a vapor barrier or, better yet, sprayed-on insulation could be applied and then the drywall replaced. The trim would be either refinished (if it came off easily, without large nail holes) or replaced with material of similar size and shape.

Assuming that the second-floor ceiling had a problem with mouse/bat urine, the interior will be completely rehabilitated during this phase, with the second floor cubbyholes and ceiling properly insulated. Spray-on insulation would be best for the ceiling as it will both insulate and provide a vapor barrier to what will now be a warm roof over the living space. The same product would be used on the living space walls and floor of the cubbyholes. In the crawl space, the underside of the

floor should also have spray-on insulation applied after the plumbing, electrical, and heating systems are upgraded.

The lead paint on the exterior walls will have to be remediated and then the siding repainted. The paint should be inspected carefully to determine the original color of the structure so that it can be replicated. Remove any deteriorated caulk and replace with a good elastomeric caulk of the proper color, such as Big Stretch, and the joint tooled for a nice finish.

This phase should remove the old shingles and install new ones. During the roofing work, any vents that have not been addressed before should be installed to make sure the cubbyhole spaces are adequately vented.

8. Wolf cabin

Wash and stain exterior. If there are any gaps in the joints between the logs, they should be sealed with a good elastomeric caulk of the proper color, such as Big Stretch (brown), and the joint tooled for a nice finish. Remove any deteriorated caulk at all fenestration and replace with a good elastomeric caulk of the proper color, such as Big Stretch, and the joint tooled for a nice finish.

Install new shingles and fascia. Since the shingles are off, this is a good time to insulate the roof. To accomplish this, either the thickness of the roof must be increased or a new ceiling installed under the exposed roof sheathing. Structural insulated panels could be used with a minimal fascia increase to 8-9". Investigation will determine the appropriate insulation, vapor barrier, and roof venting while maintaining an acceptable exterior modification. This would also be a good time to explore the possibility of creating a partial log fascia to recreate the original half-log fascia. Ely-area log builders should be able to work with a local saw mill operator to cut something that will work for the increased dimension without being too heavy.

9. Laboratory

No work

10. Insectary

No work

11. Root Cellar

No work

12. Outhouse/Sauna

No work

13. Yurts

Two additional 16' yurts will be installed.

14. Temporary Kitchen Trailer

The camp will need a commercial kitchen to prepare meals for staff and corpsmembers. The most inexpensive way to accommodate this need in this phase would be to bring in a temporary kitchen trailer. This will be hooked-up to the new septic system. It will be removed after the building #10 kitchen and restrooms facility is built in phase III. All of the equipment should be usable in the new kitchen. This alternative, though about equal in initial cost, will provide a commercial kitchen more quickly and with a better layout than would be possible in the ranger cabin as was discussed in phase I. The kitchen trailer can also be sold when no longer needed.

[Note: Another option which would save money in the long run, would be to move the building #10 kitchen and restrooms facility work into this phase and not purchase the temporary kitchen or build building #15 temporary shower house.]

15. Temporary Shower House

In this phase there will be work crews with up to 30 corpsmembers coming in at a time that will need to be able to clean up. A temporary shower house will have to be utilized until building #10 work is completed in phase III. The new septic system will be sized to accommodate showers for up to 50 so it can handle this temporary building. Consideration of using a shower trailer similar to that of the kitchen trailer is possible. For the purpose of this report, we are considering constructing a temporary shower house.

The seasonal building will be built on piers for ease of removal after the work on building #10 is completed in phase III. The building will be located on the east side of the drive between the garage and the insectary.

PHASE III – Final Build-out

This phase will implement Northern Bedrock's long-range plans. HRS will be a site that accommodates small groups of up to 30 during the winter and large groups of 30–50 during the summer.

Overall Site

A fresh gravel overlay should be applied to all of the roads within the site as shown on the phase III site plan.

1. Garage

The cracked concrete floor will be torn out and a new heated slab installed in the warehouse portion. The perimeter wall foundation will be repaired where needed, entirely furred out, insulated with 4" of sprayed-on foam, and paneled. A 36" man door will be installed in the original log-dividing wall to access the other section of the warehouse, the old workshop. A heated slab will replace the deteriorated floor in this section as well.

The original power station room will be heated with an electric unit heater and used as tool storage and as a workshop for staff, heated separately from the rest of the building with an electric unit heater. New storm windows will be provided for all fenestration. The original style carriage doors will be reconstructed and installed, as will the two exterior herringbone man doors to match the original.

4. Boat house

The boat house will have the floor replaced and the foundation repaired. A new dock extending out into the river as the original, will be installed. Because the DNR now requires that docks be removable and the ice often takes out crib docks, an A-frame dock will be put in. The DNR will probably want it shorter than the original shown on old site plans. During the winter, it will be winched up and out of the water.

6. Ranger cabin

A new, more-efficient furnace will be installed to replace the old one. The ranger cabin will be one of the last buildings to have a new roof installed and be washed, prepped, and stained. The exterior will also be caulked as needed at this time.

9. Mess hall

The mess hall will be a rehabilitation of the current laboratory building and will not change the existing exterior other than refreshing the finishes. The layout of the interior will remain the same with the retention of most of the built-in cabinetry and interior partitions. The current office space will be retained for staff use. A forced-air furnace, as is currently there, will heat the structure. An entrance ramp will be installed to make the building handicap accessible.

10. Kitchen and restrooms

A new kitchen and restrooms facility that includes showers will replace the current insectary, which has a cracked and heaved concrete floor in the garage portion and no floor in the screened-in porch (this floor was rotted and will have been removed during a prior phase). The commercial kitchen will include food storage, food prep, and a cafeteria-style serving line. A restroom and shower component will be added on the south side. This will be connected to the laboratory with an enclosed and heated dogtrot. The current laboratory will become the mess hall with an outdoor seating area on a south-side deck. The kitchen will be a simple building resembling the original insectary in form and shape. Built with a slab-on-grade, the building will be designed to conform to the Secretary of the Interior's guidelines to be compatible with the historic district. The exterior will have the same 4" lap siding as the existing insectary and laboratory. Because the building will be built on grade, the facility will be accessible to people with disabilities.

11. Root Cellar

No work

12. Outhouse/Sauna

No work

13. Yurts

Build 2 additional 16' yurts.

14. Temporary Kitchen Trailer

Remove temporary kitchen after building #10 is operational.

15. Temporary Shower House

Demolish temporary shower house after building #10 is operational.

Appendix B – Cost Analysis for Site Rehabilitation

The following Cost Analysis for Site Rehabilitation spreadsheets provide some information about how the costs were determined. The costs are not designed to be precise and complete estimates. The spreadsheets show what is included and gives a rough idea of how the numbers were derived.

Appendix B

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE I COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST
	Site						
		Inspect septic system	1	LS	\$750.00	\$750.00	
		Inspect and test water supply	1	LS	\$500.00	\$500.00	
		Inspect electrical -- all bldgs. and site	1	LS	\$2,000.00	\$2,000.00	
		Inspect entire site for hazardous materials	1	LS	\$7,500.00	\$7,500.00	
		Install entrance sign	1	LS	\$1,000.00	\$1,000.00	
		Brush recreation area	1	LS	\$500.00	\$500.00	
		Subtotal					\$12,250.00
1	Garage						
		Install electric entrance panel, service and check devices	1	LS	\$2,000.00	\$2,000.00	
		Install fire and smoke alarms, CO detectors	1	LS	\$1,000.00	\$1,000.00	
		Install borate rods in lower logs	300	EA	\$10.00	\$3,000.00	
		Install roof vent	1	LS	\$500.00	\$500.00	
		Clean up	1	LS	\$500.00	\$500.00	
		Subtotal					\$7,000.00
2	Oil house						
		Install borate rods in lower logs	70	EA	\$10.00	\$700.00	
		Modify shelving	1	LS	\$500.00	\$500.00	
		Clean up	1	LS	\$250.00	\$250.00	
		Subtotal					\$1,450.00
3	Outhouse						
		Clean up	1	LS	\$100.00	\$100.00	
		Subtotal					\$100.00
4	Boat house						
		Install permanent ventilation	1	LS	\$500.00	\$500.00	
		Install borate rods	192	EA	\$10.00	\$1,920.00	

Appendix B

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE I COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST
		Install fire and smoke alarms, CO detectors	1	LS	\$750.00	\$750.00	
		Clean up	1	LS	\$250.00	\$250.00	
		Subtotal					\$3,420.00
5	Pump house						
		Remove plywood on interior walls and batt insulation	1	LS	\$500.00	\$500.00	
		Insulate roof	180	SF	\$6.00	\$1,080.00	
		Provide ventilation	1	LS	\$500.00	\$500.00	
		Install borate rods	85	EA	\$10.00	\$850.00	
		Install new power line	750	LF	\$7.50	\$5,625.00	
		Test water	1	LS	\$250.00	\$250.00	
		Install new pump	1	EA	\$2,000.00	\$2,000.00	
		Clean up	1	LS	\$250.00	\$250.00	
		Subtotal					\$11,055.00
6	Ranger cabin						
		Remove vermin-infested insulation and seal entrance holes	1	LS	\$4,500.00	\$4,500.00	
		Inspect heating system	1	LS	\$150.00	\$150.00	
		Clean fireplace chimney	1	LS	\$200.00	\$200.00	
		Inspect electrical system and repair deficiencies	1	LS	\$5,000.00	\$5,000.00	
		Install fire and smoke alarms, CO detectors	1	LS	\$2,000.00	\$2,000.00	
		Repair chimney exterior	1	LS	\$2,500.00	\$2,500.00	
		Install new wood screens throughout	285	SF	\$7.50	\$2,137.50	
		Inspect fireplace and chimney	1	LS	\$200.00	\$200.00	
		R&R floor tile	1200	SF	\$4.00	\$4,800.00	
		Remove 2 nd floor ceiling	1	LS	\$500.00	\$500.00	
		Remove dormer paneling	1	LS	\$500.00	\$500.00	
		R&R basement drain pipe to septic tank	1	LS	\$3,000.00	\$3,000.00	
		Install new low-water-usage toilet	1	LS	\$500.00	\$500.00	
		Prep and paint basement walls in lav and shower area	574	SF	\$3.50	\$2,009.00	
		Repair or replace basement drain	30	LF	\$6.00	\$180.00	

Appendix B

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE I COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST
		Install accessibility ramp and front porch with railings	1	LS	\$2,500.00	\$2,500.00	
		Install 2 nd basement egress - Window	1	LS	\$4,000.00	\$4,000.00	
		Remove trash	1	LS	\$750.00	\$750.00	
		Demolish non-load-bearing walls	230	SF	\$3.00	\$690.00	
		Install new stud walls	180	SF	\$1.82	\$327.60	
		Install plumbing for 3-fixture bathroom	1	LS	\$6,500.00	\$6,500.00	
		Install drywall on studs	90	SF	\$1.59	\$143.10	
		Install drywall on ceilings	540	SF	\$1.89	\$1,020.60	
		Install half-log siding in hallway	72	SF	\$8.00	\$576.00	
		Install bath ceiling and wall FRP panels	200	SF	\$3.74	\$748.00	
		Install bath electrical, including ventilation fan	1	LS	\$1,000.00	\$1,000.00	
		Hygienist and hazardous material disposal	1	LS	\$1,500.00	\$1,500.00	
		Kitchen cabinets and sink	1	LS	\$3,000.00	\$3,000.00	
		Clean up	1	LS	\$3,000.00	\$3,000.00	
		Subtotal					\$53,931.80
7	Bunkhouse						
		Install fire and smoke alarms, CO detectors	1	LS	\$2,000.00	\$2,000.00	
		Inspect heating system	1	LS	\$150.00	\$150.00	
		Remove insulation and block vermin holes, vent.	1	LS	\$4,500.00	\$4,500.00	
		Remove trash	1	LS	\$750.00	\$750.00	
		Clean up	1	LS	\$1,000.00	\$1,000.00	
		Subtotal					\$8,400.00
8	Wolf cabin						
		Provide ventilation	1	LS	\$500.00	\$500.00	
		R&R floor tile	520	SF	\$4.00	\$2,080.00	
		Install fire and smoke alarms, CO detectors	1	LS	\$2,000.00	\$2,000.00	
		Remove paint from window casings and repaint	10	EA	\$272.00	\$2,720.00	
		Insert borate rods in logs	187	EA	\$10.00	\$1,870.00	
		Clean up	1	LS	\$1,000.00	\$1,000.00	
		Subtotal					\$10,170.00

Appendix B

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE I COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST
9	Laboratory						
		Patch roof/repair flashing	1	LS	\$500.00	\$500.00	
		Provide ventilation.	1	LS	\$500.00	\$500.00	
		Subtotal					\$1,000.00
10	Insectory						
		Demolish old screen-porch floor, support roof structure	1	LS	\$1,000.00	\$1,000.00	
		Clean up	1	LS	\$250.00	\$250.00	
		Subtotal					\$1,250.00
11	Cellar						
		Provide ventilation and secure from casual entrance	1	LS	\$500.00	\$500.00	
		Subtotal					\$500.00
12	Outhouse/Sauna						
		Provide ventilation and secure from casual entrance	1	LS	\$250.00	\$250.00	
		R&R shingles	150	SF	\$3.00	\$450.00	
		Level and block building	1	LS	\$750.00	\$750.00	
		Install borate rods	450	EA	\$10.00	\$4,500.00	
		Haul supplies, mat'l, and demolition mat'l	1	LS	\$500.00	\$500.00	
		Subtotal					\$6,450.00
13	Yurts						
		Yurt	1	EA	\$9,400.00	\$9,400.00	
		Platform	200	SF	\$20.00	\$4,000.00	
		Deck and stair	48	SF	\$20.00	\$960.00	
		Foot path, gravel surface	1	LS	\$500.00	\$500.00	
		Subtotal					\$14,860.00

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NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE I COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST
14	Temp Kitchen						
		Subtotal					\$0.00
15	Temp Showers						
		Subtotal					\$0.00
Sub-total Phase I- Stabilization Mat'l, Labor, and Contractor O&P							\$131,836.80
	Project Mgmt	10% of project cost			10%		\$13,383.68
	Contingency	20% of project cost to allow for higher than normal unexpected costs			20%		\$26,767.36
Total Phase I – Stabilization							\$171,987.84

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NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE II COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UN	UNIT COST	ITEM COST	AREA COST
	Site						
		Parking	1	LS	\$5,000.00	\$5,000.00	
		Upgrade site electrical service w/poles and transformer	1	LS	\$15,000.00	\$15,000.00	
		Install building signage	13	EA	\$75.00	\$975.00	
		Install building electric service entrances	12	EA	\$3,000.00	\$36,000.00	
		Upgrade site lighting	5	EA	\$2,500.00	\$12,500.00	
		Upgrade septic system for phase II and III plumbing needs	1	LS	\$75,000.00	\$75,000.00	
		R&R sidewalk – asphaltic concrete	25	SY	\$24.30	\$607.50	
		Subtotal					\$145,082.50
1	Garage						
		Install new insulated roof – structural insulated panels	2500	SF	\$5.60	\$14,000.00	
		R&R shingles	2500	SF	\$3.00	\$7,500.00	
		Install fascia	230	LF	\$5.00	\$1,150.00	
		Wash, prep and stain exterior	1400	SF	\$2.00	\$2,800.00	
		Caulk	1	LS	\$1,600.00	\$1,600.00	
		Install additional power outlets	20	EA	\$163.00	\$3,260.00	
		Subtotal					\$30,310.00
2	Oil house						
		R&R shingles	300	SF	\$3.00	\$900.00	
		Install half-log fascia	1	LS	\$750.00	\$750.00	
		Wash, prep and stain	734	SF	\$2.00	\$1,468.00	
		Install built-in shelving	1	LS	\$400.00	\$400.00	
		Subtotal					\$3,518.00
3	Outhouse						
		Wash, prep and stain – int/ext	200	SF	\$2.00	\$400.00	
		Subtotal					\$400.00
4	Boathouse						
		R&R shingles	620	SF	\$3.00	\$1,860.00	
		Install fascia	100	LF	\$5.00	\$500.00	

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NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE II COST ANALYSIS- Revised 8/8/2014

		Wash, prep and stain exterior	1400	SF	\$2.00	\$2,800.00	
		Subtotal					\$5,160.00
5	Pump house						
		R&R shingles	204	SF	\$3.00	\$612.00	
		Install new fascia	56	LF	\$5.00	\$280.00	
		Wash, prep and stain	412	SF	\$3.00	\$1,236.00	
		Caulk exterior as needed	1	LS	\$300.00	\$300.00	
		Insulate roof – Spray-on	100	SF	\$6.00	\$600.00	
		Provide ventilation	1	LS	\$750.00	\$750.00	
		Subtotal					\$3,778.00
6	Ranger cabin						
		Insulate attic – spray-on	1300	SF	\$6.00	\$7,800.00	
		Replace bead-board ceiling	400	SF	\$5.00	\$2,000.00	
		Vent roof	1	LS	\$800.00	\$800.00	
		Caulk	1	LS	\$3,000.00	\$3,000.00	
		Subtotal					\$13,600.00
7	Bunkhouse						
		Demolish interior wall finishes	584	SF	\$0.41	\$239.44	
		Upgrade electrical	850	SF	\$8.00	\$6,800.00	
		Plumbing per fixture and water heater	6	EA	\$2,600.00	\$15,600.00	
		Install heating – gas stove with pipe and vent	1	EA	\$4,000.00	\$4,000.00	
		Install drywall	600	SF	\$1.55	\$930.00	
		Install new doors – includes framing enlargement	3	EA	\$1,500.00	\$4,500.00	
		Install trim	650	LF	\$4.00	\$2,600.00	
		Paint interior	1	LS	\$4,000.00	\$4,000.00	
		Prep and paint exterior	1200	SF	\$3.00	\$3,600.00	
		Insulation – blown in in walls and spray-on in attic	2000	SF	\$5.00	\$10,000.00	
		Install new screens and storms	538	SF	\$7.50	\$4,035.00	
		Install ventilation fan	1	EA	\$250.00	\$250.00	
		Subtotal					\$56,554.44

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NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE II COST ANALYSIS - Revised 8/8/2014

8	Wolf cabin					
	R&R shingles	830	SF	\$3.00	\$2,490.00	
	Insulate roof w/ structural insulated panels	830	SF	\$5.60	\$4,648.00	
	Install new fascia	1	LS	\$1,000.00	\$1,000.00	
	Prep and paint exterior	1100	SF	\$3.00	\$3,300.00	
	Install ventilation fan	1	EA	\$250.00	\$250.00	
	Paint interior	1	SF	\$1,000.00	\$1,000.00	
	Install sewage ejector, manhole, and pipe	1	LS	\$4,000.00	\$4,000.00	
	Plumbing per fixture and water heater	4	EA	\$2,600.00	\$10,400.00	
	Upgrade electrical	520	SF	\$5.00	\$2,600.00	
	Install heating – gas stove with pipe and vent	1	EA	\$4,000.00	\$4,000.00	
	Subtotal					\$33,688.00
9	Laboratory					
	Subtotal					\$0.00
10	Insectory					
	Subtotal					\$0.00
11	Cellar					
	Subtotal					\$0.00
12	Outhouse/Sauna					
	Subtotal					\$0.00
13	Yurts					
	Yurt	2	EA	\$9,400.00	\$18,800.00	
	Platform	400	SF	\$20.00	\$8,000.00	
	Deck and stair	96	SF	\$20.00	\$1,920.00	
	Foot path	1	LS	\$500.00	\$500.00	
	Sub-Total					\$29,220.00

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NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE II COST ANALYSIS - Revised 8/8/2014

14	Temp Kitchen Trailer					
	Install temporary kitchen trailer	1	LS	\$15,000.00	\$15,000.00	
	Install trailer utility hookup	1	LS	\$3,000.00	\$3,000.00	
	Sub-Total					\$18,000.00
15	Temp Shower House					
	Floor piers, framing and decking	225	SF	\$20.00	\$4,500.00	
	Walls with drywall one side and siding one side	570	SF	\$9.50	\$5,415.00	
	Screen wall	180	SF	\$4.00	\$720.00	
	Metal roof with rafters and sheathing	370	SF	\$9.60	\$3,552.00	
	Dressing area partitions with doors	8	EA	\$400.00	\$3,200.00	
	Doors	3	EA	\$1,500.00	\$4,500.00	
	Lavatory	6	EA	\$1,750.00	\$10,500.00	
	Mirrors	6	EA	\$234.00	\$1,404.00	
	Lighting	10	EA	\$320.00	\$3,200.00	
	Exhaust fan	2	EA	\$450.00	\$900.00	
	Shower units with plumbing	8	EA	\$3,000.00	\$24,000.00	
	Hot water heater with piping and hook-ups	1	EA	\$6,000.00	\$6,000.00	
	Sewer	75	LF	\$20.00	\$1,500.00	
	Sub-Total					\$69,391.00
Sub-total Phase II - Rehabilitation Material, Labor, and Contractor O&P						\$321,310.94
Project Mgmt	10% of project cost			10%		\$32,131.09
Contingency	15% of project cost			15%		\$48,196.64
Total Phase II – Rehabilitation						\$401,638.68

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE III COST ANALYSIS - Revised 8/8/2014

BLDG	AREA	ITEM	QTY	UN	UNIT COST	ITEM COST	AREA COST
	Site						
		Roadway and Parking areas	1	LS	\$5,000.00	\$5,000.00	
		R&R Sidewalk – asphaltic concrete	33	SY	\$24.30	\$801.90	
		Sub-Total					\$5,801.90
1	Garage						
		R&R concrete floor w/heated slab	960	SF	\$11.00	\$10,560.00	
		New carriage doors – to match original	3	EA	\$2,500.00	\$7,500.00	
		New manddoors – to match original	1	EA	\$1,200.00	\$1,200.00	
		Screens/Storms	227	SF	\$7.50	\$1,702.50	
		Electric	1500	SF	\$3.00	\$4,500.00	
		Lighting	1500	SF	\$2.00	\$3,000.00	
		Utility sink, piping, sewer	1	LS	\$5,000.00	\$5,000.00	
		Heating-boiler	1	LS	\$4,500.00	\$4,500.00	
		Foundation Repair	1	LS	\$2,000.00	\$2,000.00	
		Insulate and panel interior of foundation	150	LF	\$45.00	\$6,750.00	
		Interior door including cut out in log wall	1	LS	\$1,500.00	\$1,500.00	
		Propane Unit Heaters	2	EA	\$1,200.00	\$2,400.00	
		Ventilation Fan for work area	1	EA	\$1,300.00	\$1,300.00	
		Sub-Total					\$51,912.50
2	Oil House						
		New sliding windows w/screens, trim and paint	1	LS	\$3,000.00	\$3,000.00	
		Restore door	1	LS	\$1,500.00	\$1,500.00	
		Sub-Total					\$4,500.00
3	Outhouse						
		Sub-Total					\$0.00
4	Boathouse						
		R&R concrete floor	380	SF	\$6.00	\$2,280.00	
		Repair foundation	1	LS	\$1,000.00	\$1,000.00	
		Restore Sliding Door	1	LS	\$1,000.00	\$1,000.00	
		Dock	1	LS	\$3,000.00	\$3,000.00	

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE III COST ANALYSIS - Revised 8/8/2014

		Sub-Total							\$7,280.00
5	Pump House								
								\$0.00	
		Sub-Total							\$0.00
6	Ranger Cabin								
		Furnace	1	EA	\$2,500.00		\$2,500.00		
		R&R shingles	2700	SF	\$3.00		\$8,100.00		
		Wash, Prep and Stain	3250	SF	\$3.00		\$9,750.00		
		Caulk exterior as needed	1	LS	\$1,500.00		\$1,500.00		
		Sub-Total							\$21,850.00
7	Bunkhouse								
		Sub-Total							\$0.00
8	Wolf Cabin								
		Sub-Total							\$0.00
9	Mess Hall								
		Remove insulation and plug mouse holes	1	LS	\$4,500.00		\$4,500.00		
		R&R linoleum using vinyl	750	SF	\$4.00		\$3,000.00		
		Electrical	750	SF	\$9.50		\$7,125.00		
		Install fire and smoke alarms, CO detectors	1	LS	\$1,000.00		\$1,000.00		
		Plumbing	1	LS	\$4,500.00		\$4,500.00		
		Heating	1	LS	\$3,000.00		\$3,000.00		
		Insulate roof-blown in	750	SF	\$1.75		\$1,312.50		
		Insulate crawl space w/sprayed-on insul under floor	750	SF	\$6.00		\$4,500.00		
		R&R shingles	1220	SF	\$3.00		\$3,660.00		
		Paint interior	1150	SF	\$0.75		\$862.50		
		Hygienist during lead removal	1	EA	\$3,000.00		\$3,000.00		
		Exterior leaded paint removal	1000	SF	\$8.00		\$8,000.00		
		Paint exterior	1000	SF	\$3.00		\$3,000.00		

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE III COST ANALYSIS - Revised 8/8/2014

		Sub-Total					\$47,460.00
10	Kitchen						
		Demolish old building, dispose of waste	1	LS	\$5,000.00	\$5,000.00	
	Dogtrot	Enclosure w/floor,doors and roof	240	SF	\$85.00	\$20,400.00	
		Construct new kitchen/shower house/restrooms	1150	SF	\$165.00	\$189,750.00	
		Sub-Total					\$215,150.00
11	Cellar						
		Sub-Total					\$0.00
12	Outhouse/Sauna						
		Sub-Total					\$0.00
13	Yurts						
		Additional yurts	2	EA	\$9,400.00	\$18,800.00	
		Platforms	400	SF	\$20.00	\$8,000.00	
		Decks and stairs	96	SF	\$20.00	\$1,920.00	
		Sub-Total					\$28,720.00
14	Temp Kitchen Trailer						
		Dispose of kitchen trailer	1	LS	\$100.00	\$100.00	
		Remove hook-ups	1	LS	\$500.00	\$500.00	
		Subtotal					\$600.00
15	Temp Shower House						
		Demolition	1	LS	\$4,000.00	\$4,000.00	
		Subtotal					\$4,000.00
Sub-total Phase III- Final Build-Out Material, Labor, and Contractor O&P							\$387,274.40

NORTHERN BEDROCK - HALFWAY RANGER STATION

PHASE III COST ANALYSIS - Revised 8/8/2014

Project Mgmt	10% of project cost			10%		\$38,727.44
Contingency	15% of project cost			15%		\$58,091.16
Architectural Fees for Kitchen Bldg	10% of bldg costs			10%		\$21,515.00
Total Phase III – Final Build-Out						\$505,608.00

Appendix C – Cost Analysis for Furniture and Equipment

The following Cost Analysis for Furniture and Equipment spreadsheets include certain items of furniture and equipment to be able to function as a conservation corps base. Things like beds, chairs, tables, and hand tools have been allocated. It is not meant to be a complete listing, but should be enough to get the organization started on site. This spreadsheet is meant to capture as much of the operating costs to be incurred by Northern Bedrock have been thought about although actual costs may be different.

APPENDIX C

NORTHERN BEDROCK - HALFWAY RANGER STATION

FURNITURE AND EQUIPMENT - 1/23/2013

	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST	PHASE COST
PHASE I								
	Sitework							
		Lawnmower	1	EA	\$3,000.00	\$3,000.00		
		Sub-Total					\$3,000.00	
1	Garage							
		Shelving	1	LS	\$800.00	\$800.00		
		Hand Tools-shovels, rakes, picks, pry bars	35	EA	\$15.00	\$525.00		
		Chain Saw	3	EA	\$650.00	\$1,950.00		
		Misc tools	1	LS	\$1,000.00	\$1,000.00		
		Sub-Total					\$4,275.00	
4	Boathouse							
		Canoes-Used Aluminum	10	EA	\$400.00	\$4,000.00		
		Life Vests	30	EA	\$40.00	\$1,200.00		
		Paddles	30	EA	\$35.00	\$1,050.00		
		Sub-Total					\$6,250.00	
6	Ranger Cabin							
		Bunk Beds w/mattress and pillows	4	EA	\$700.00	\$2,800.00		
		Chairs	4	EA	\$200.00	\$800.00		
		Couch	1	EA	\$400.00	\$400.00		
		Refrigerator/range (residential)	1	LS	\$1,200.00	\$1,200.00		
		Tables and Chairs on porch	1	LS	\$500.00	\$500.00		
		Sub-Total					\$5,700.00	
7	Bunkhouse							
		Bunk Beds w/mattress and pillows	4	EA	\$700.00	\$2,800.00		
		Chairs	4	EA	\$200.00	\$800.00		
		Tables and Chairs on porch	1	LS	\$200.00	\$200.00		
		Sub-Total					\$3,600.00	
8	Wolf Cabin							

APPENDIX C

NORTHERN BEDROCK - HALFWAY RANGER STATION

FURNITURE AND EQUIPMENT - 1/23/2013

	AREA	ITEM	QTY	UNIT	UNIT COST	ITEM COST	AREA COST	PHASE COST
10	Kitchen							
		Equipment	1	LS	\$20,000.00	\$20,000.00		
		Sub-Total					\$20,000.00	
11	Cellar							
		Sub-Total					\$0.00	
12	Outhouse/Sauna							
						\$0.00		
		Sub-Total					\$0.00	
13	Yurts							
		Bunk Beds w/mattress and pillows	8	EA	\$700.00	\$5,600.00		
		Chairs	8	EA	\$200.00	\$1,600.00		
		Sub-Total					\$7,200.00	
	Sub-total Phase III – Furniture/Equipment							\$39,200.00
	TOTAL FURNITURE/EQUIPMENT							\$75,975.00

Appendix D – Cost Analysis for HRS Physical Operations Budget

The implementation of Northern Bedrock’s plan for the Halfway Ranger Station is to be phased in over time, a period that will be determined by the availability of funding. The projected costs of operating the facility can be reasonably estimated for only the first year. As improvements are completed, additional operation costs will need to be factored in. The NRS has provided the costs of electricity and fuel oil for the past year; these costs will increase for additional usage of the site. Anticipated costs of operation, including lawn mowing, snowplowing, and general maintenance allowance will be added to the budget.

The cost for maintenance was calculated as a monthly charge for a maintenance person on site the equivalent of one week per month; some months will be more and some months will be less throughout a 12 month period. The fuel oil to heat the ranger cabin, the only heated building at present, is calculated to be a bit higher than the 12 months ending October 30, 2012 due to the mild winter during that time period.

Northern Bedrock may be able to realize a savings by heating only the basement and blocking off the main floor at the entrance. If no one is using the building, the only critical issue for freezing will be the basement due to the main water storage tank for the site and the main water line. The first-floor plumbing could be drained. The electric costs will go up since more activity will be added to the minimal site lighting and power used in the recent past. The primary power consumption has been the site security lighting and the oil furnace in the ranger cabin. There should not be a large increase in the power used during the first year, as year-round site usage is not anticipated.

Maintenance costs during the first year will be higher than they will be in the years that follow. These costs should decrease as the site receives repairs left undone up to now and improvements are made. Snowplowing will vary year to year based on the amount of snow that actually falls. It is calculated at 15 times a winter for purposes of this analysis.

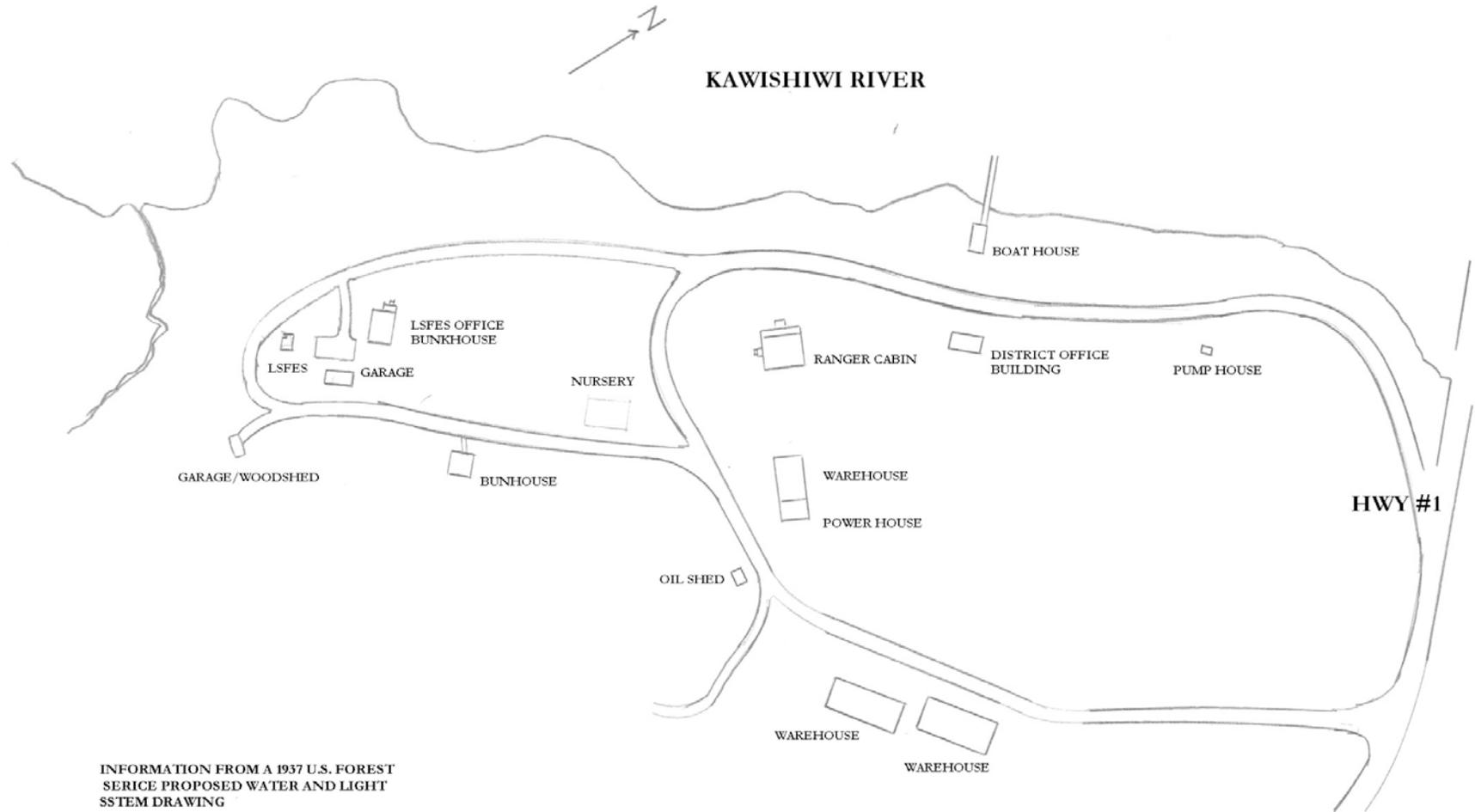
PHYSICAL OPERATIONS BUDGET First year of operations

Electricity	\$4,200
Fuel oil	\$2,500
Propane for kitchen stoves	\$300
Maintenance	\$24,000
Snowplowing	\$2,250
Total Physical Operations Budget for First Year	\$33,250

Appendix E – Site Plans

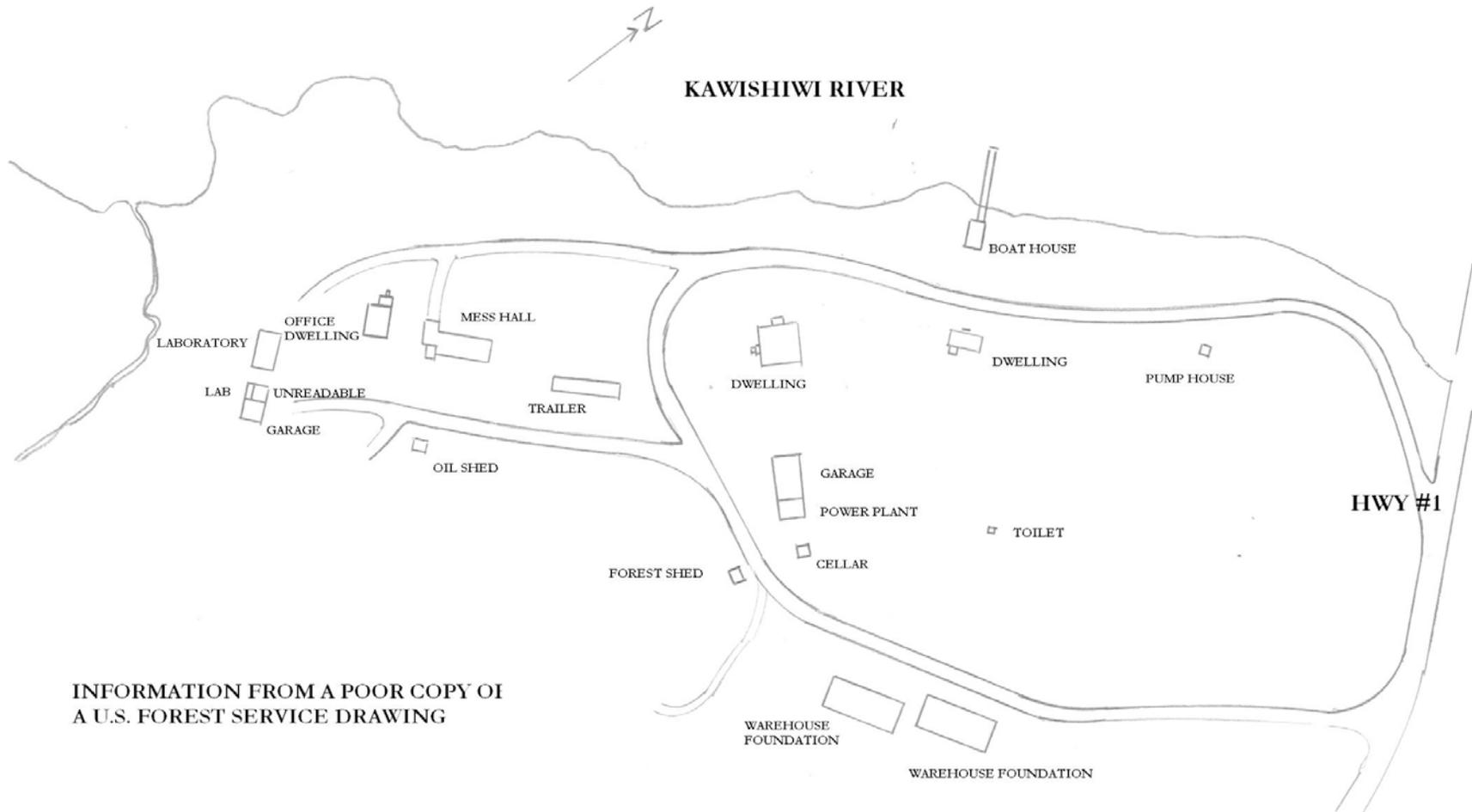
The following site plans reflect both the historic site rehabilitation and the proposed.

(73)



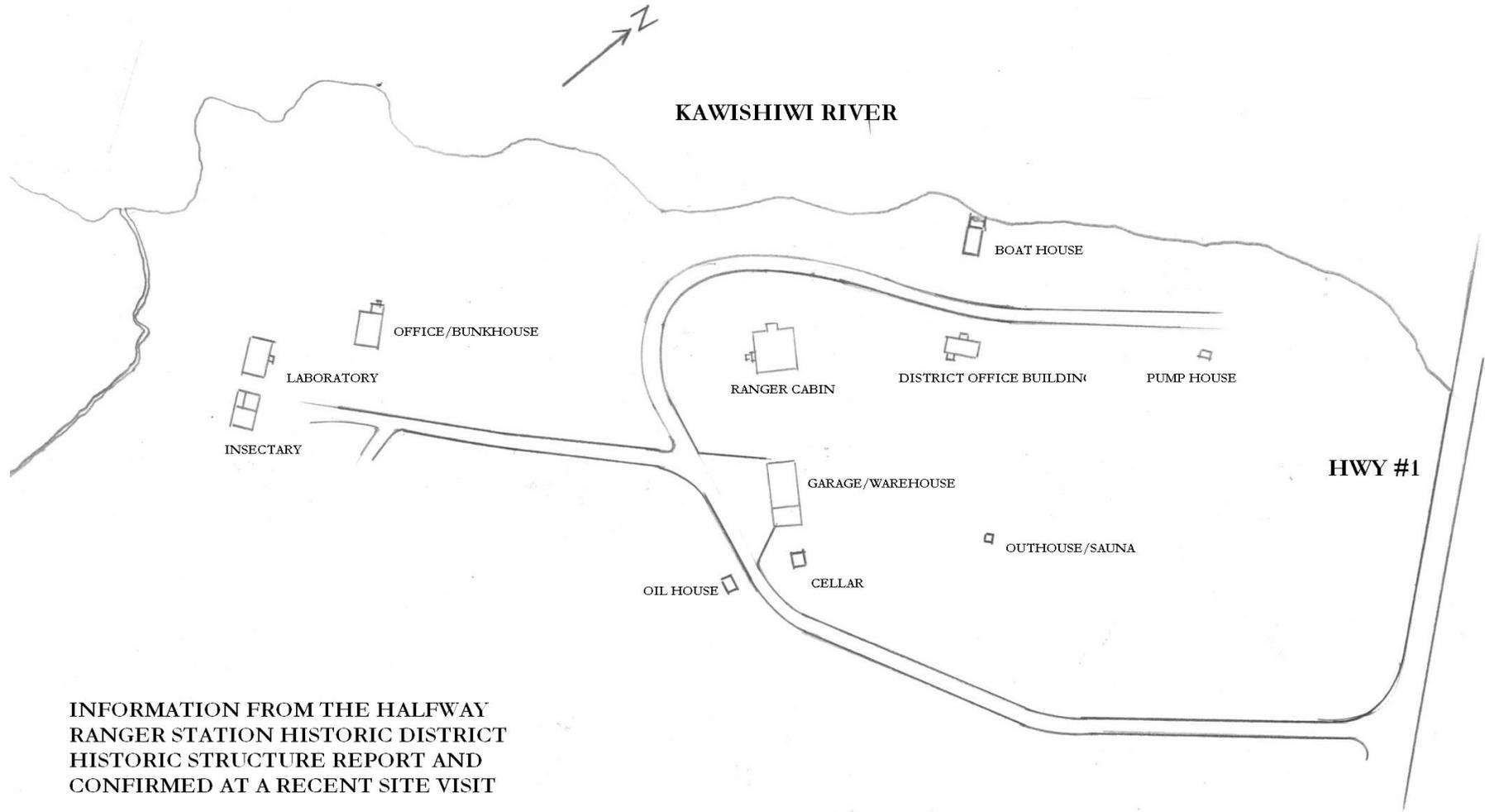
INFORMATION FROM A 1937 U.S. FOREST
SERVICE PROPOSED WATER AND LIGHT
SYSTEM DRAWING

**DRAWING #1 - 1937 SITE PLAN
HALFWAY RANGER STATION/LSFES**



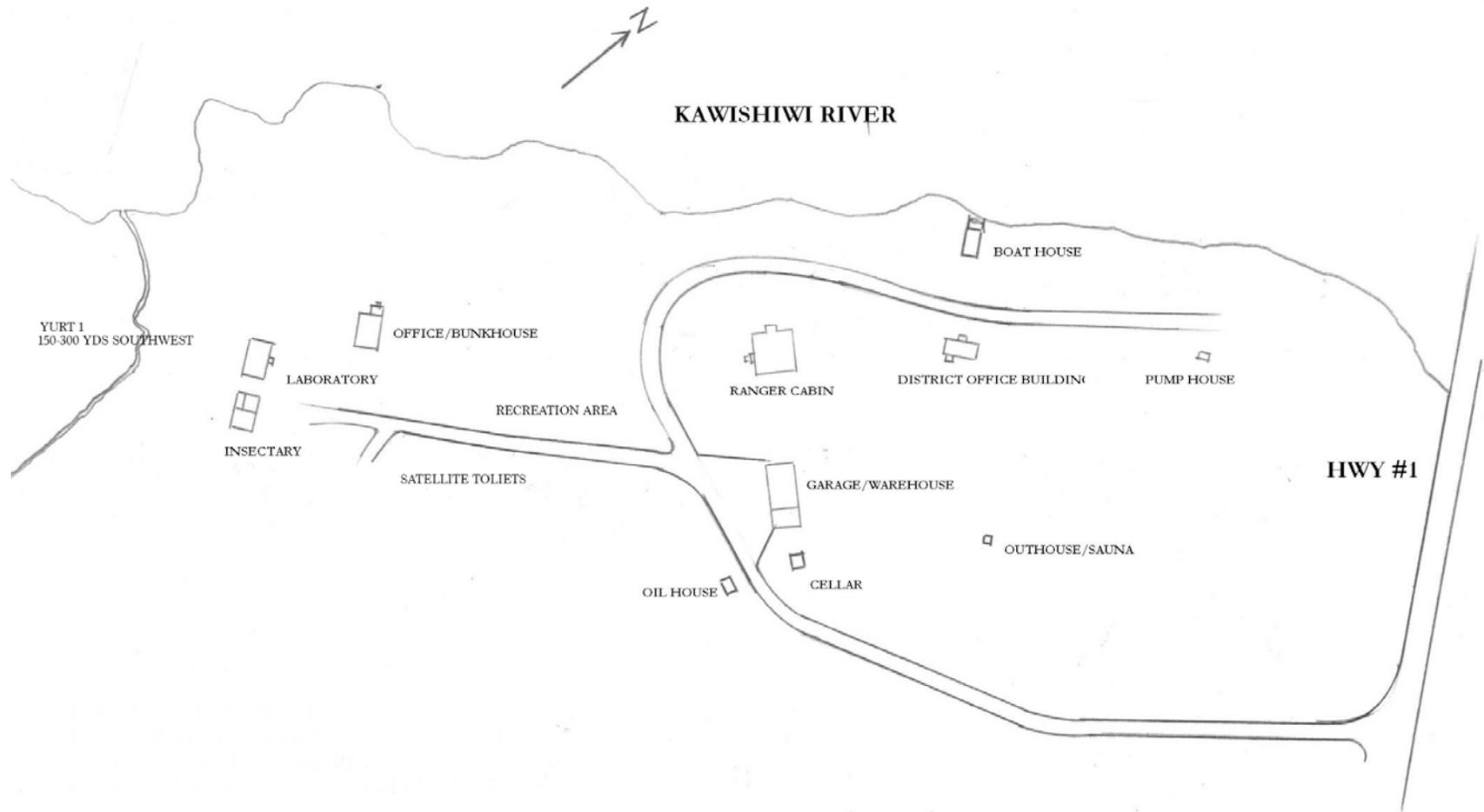
INFORMATION FROM A POOR COPY OF
A U.S. FOREST SERVICE DRAWING

DRAWING #2 - 1965 SITE PLAN
HALFWAY RANGER STATION/LSFES

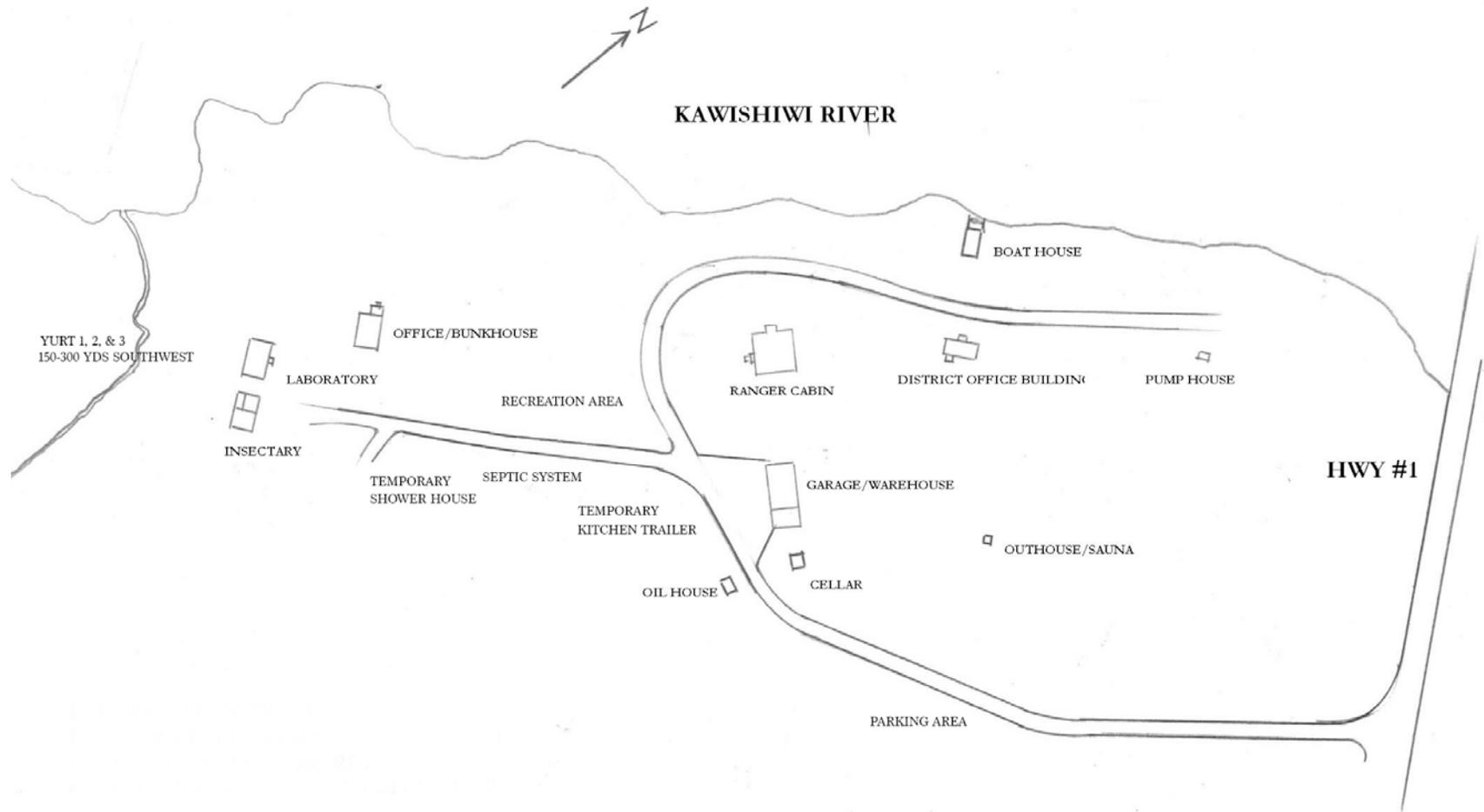


INFORMATION FROM THE HALFWAY RANGER STATION HISTORIC DISTRICT HISTORIC STRUCTURE REPORT AND CONFIRMED AT A RECENT SITE VISIT

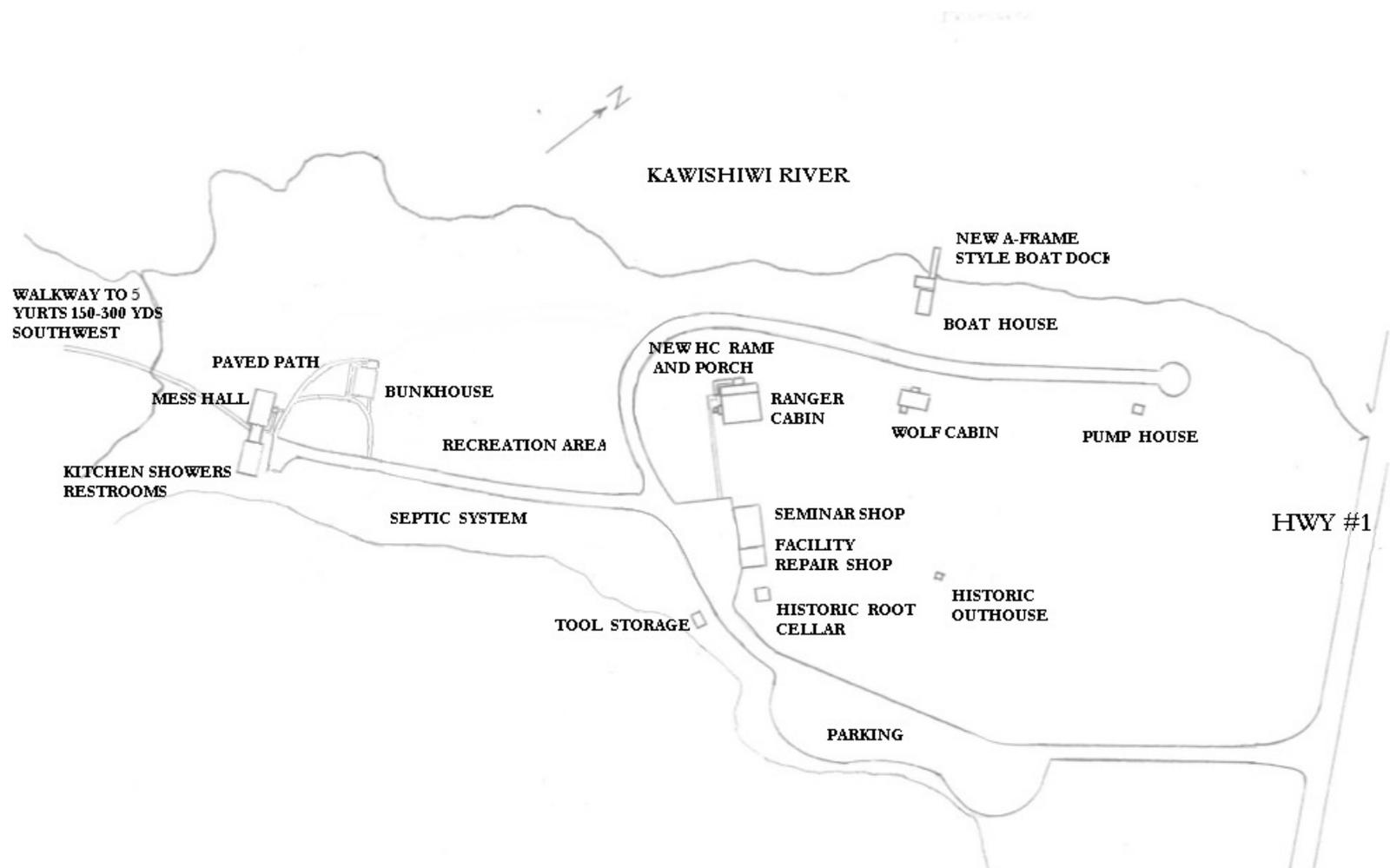
**DRAWING #3 - 2012 SITE PLAN
HALFWAY RANGER STATION/LSFES**



**DRAWING #4 - PHASE I
HALFWAY RANGER STATION/LSFES**



DRAWING #5 - PHASE II
HALFWAY RANGER STATION/LSFES



**DRAWING #6 - PHASE III COMPLETED BUILDOUT
HALFWAY RANGER STATION/LSFES**