

### Chapter 8 No Power Lines and, No Indoor Plumbing

*The pleasures of Aladdin lamps are waiting for you in this Chapter.*

*Find out,*

- *What kind of power you need.*
- *About photovoltaic benefits and limitations.*
- *How we put aside some of our 'no power ideas' and plan for the alternatives of limited power, instead of leaving altogether.*
- *About my new technology word - ZENU ©, zero, energy, net, use.*
- *All you need to know about gravity water systems.*
- *How to love your outhouse.*
- *How to add grey water plumbing to your system.*
- *What you need to do to convert to pressure water, and why do it.*
- *Everything about solar water heating, a cookstove pre heat and electric backup.*
- *What will the future bring for our beloved internet?*
- *How we had all the information we wanted from the outside world from our little six-volt battery radio.*
- *If 'no' power and plumbing are for you.*

*Bring it all with you and you have whatever you had wherever you were - do you want all that?*

#### **A sweet swinging light**

Aladdin Lamps were invented by a Nebraska farm boy, Victor Samuel Johnson in 1908, and have been enjoyed by all of us for the last ninety-four years. The lamps give a warm friendly feeling to any room, so much better than the light bulb hanging from the center of a room.

The glow of a diffusing shade of milk glass or parchment with a moose, deer, and cabin scene on it add even more to the experience. The amount of effort to light and understand how to operate these beautiful hanging and table lamps is well rewarded.

They not only give a feeling that is peaceful and unhurried: they are also excellent light. They are equal in all respects, and exceed a sixty-watt light bulb for visibility and reading; to think of any other lamp is useless in comparison. Get one for above the table, and a few for other areas of the cabin.

You must use pure kerosene, not lamp oil: lamp oil has wax in it and plugs up the wick. To light the lamp, take the chimney or gallery off and turn the evenly trimmed wick up a minimum amount. Then light the wick, and put the chimney back on. Turn the lamp all the way down and like the instructions say keep it adjusted very low for ten to fifteen minutes, until the chimney heats up: this is very important. The mantle will charcoal-up, which is a well-known feature, if you turn it too high too quickly.

- Keep it low for fifteen minutes;
- After it gets hot, then turn it up slowly, a little at a time,
- And wait . . . it will fill the room with a mellow and bright light.
- If the mantle gets black spots on it - turn it down, and they will burn away.

The problem is, if you don't watch it in the beginning and the whole mantle gets completely black, then you have to use a propane torch to try to save the mantle. The mantles are delicate and you should have a half a dozen spares around, just in case: though, if treated carefully, they last a long time.



**Image 8-1 Aladdin Kerosene Lamp** *This hanging 60 candle power lamp is quiet and gives a very mellow light with out electricity. Keep it very low at first or the mantel will get black. Never leave the lamp unattended. Katie is behind the lamp, Ashley is behind Katie. Behind Ashley is the dinning room table and the new south window. The wood box is to the left, big wood on the right for Ashley and small wood for Katie on the left.*

- One **trick** to save totally blackened mantles is: burn-off the charcoal with a small

portable propane torch.

### Don't get a generator if you don't need it

Generator was what we needed. The noisy alternate power source was a luxury for us. We had grown in knowledge and were used to manual hand tools except for the gasoline-powered chainsaw; convenient power tools were sitting in the old grain shed, beckoning.

Finally, after one year without any power we got a small Honda light-plant. Light-plant is what the neighbors call a generator; we didn't use it much, power skill saw, a drill and a few kitchen appliances: we could have done without it. Or, we could have operated the whole house on a little bigger generator: which is the point,

- You have to figure out what you want?

Smaller appliances and computers, mean either, you don't need a generator, or are only intermittently required to charge the computer's batteries. If more of a powered life style is desired then make sure you get a generator, if you need that much hard power, which will last and you can run continuously, if that is your plan.

- Not using power is one idea;
- Not connecting to a power company system is another;
- Selling them power is another.

All these systems and ideas have their uses and limitations.

The hard power items are heavy resistance loads: like a toaster, an electric hot plate or stove, or heat (hope you don't want your heat to be electric). These loads need a grid-connected system, or a properly sized big-generator, or an expensive photovoltaic system. Other smaller loads can be handled in a number of ways; pumps can be electric or a gasoline engine driven.

### Batteries, Inverter and Photovoltaic Solar Power

Photovoltaic solar system would operate our small electrical requirement. However, if cost is a consideration you must figure-out the best way to go;

- A Photovoltaic system charges a battery directly with a one-way current-flow diode in the wire between the solar collector and the battery.

There are many excellent invertors, which will either,

- Convert 12 volts (or 24 volts) power to 120 volt power,
- And be responsible for charging the batteries to the correct level, and at the correct rate, if connected to the power grid,
- Or, another charging source like a generator.

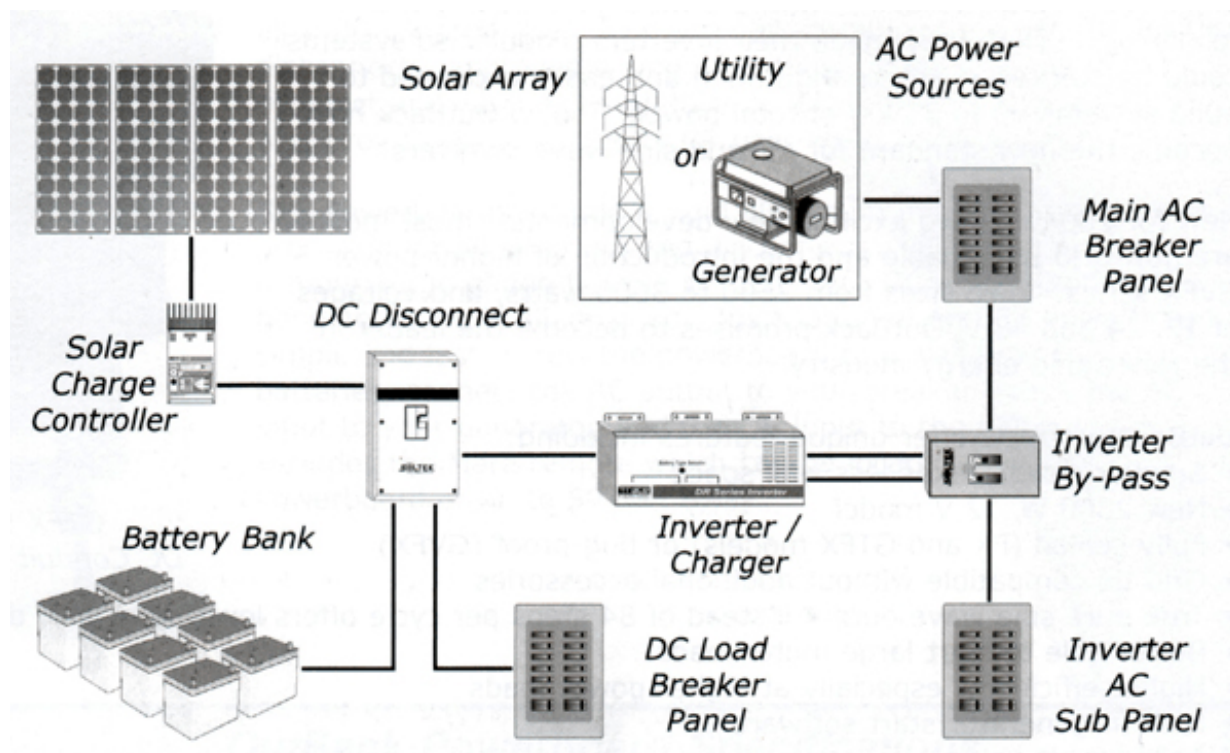


Image 8-2 **Photovoltaic Grid-Tied System** Cost for a 640 watt solar panel array, and a 3,600 watt inverter, plus grid tie and battery bank is \$6,000 CDN.

The installation ,

- Must be completed by a licensed Electrician
- And be approved by the power company.

This package includes,

- A three-thousand-six-hundred watt inverter,
- Battery bank,
- And six-hundred-forty watt solar array and install kits for each item.

The package does NOT include the wire, or the any of the distribution or 'Breaker' panels, however, other than those items not included, it is a 'complete' package. For a less expensive, see non grid connected system.

Invertor-chargers are excellent, and expensive: about three-thousand dollars for three-thousand-eight-hundred watt model. However, some sell a complete-grid connected packages, less wire and installation for \$6,000 CDN (\$5,130 USD – check the exchange rate, it changes).

Invertors sometimes need repair, but often will operate for years with no special maintenance. Some of the manufactures say they will talk you through various resets and repair, and if a part is

required, they will send it overnight, and the inverter can stay on the wall. Prices are lower and more suitable, for us homesteader do-it-yourself people – especially, if the inverter and system are not connected to the utility power grid.

The utility-connected invertors are closely regulated and even inventoried by power companies. The power company wants to know what is connected to their system – if you are selling power to them.

The batteries;

- Need to be replaced every three to seven years, depending on use and charge/discharge rates.
- A good inverter can extend battery life by keeping them properly charged, if there is an adequate power source.

Hard resistance loads: like a toaster, electric heaters, or coffee pots will draw the batteries down quickly, and are not normally used with a small inverter system; the systems must get very big to handle those big loads, which can get expensive.

However, if no grid power is nearby and you want a generator, then solar and/or wind battery charging-with-an-inverter system(s) is(are) worth considering.

If you write down all energy uses and,

- Show the watts or amps of each, then a supplier can get you the right sized panel/battery combination.
- The amps of each appliance, multiplied by the hours or portion of an hour you estimate they will be used in a day: this will give the Amp-Hours, or Watt-Hours needed.

Then you can select a battery system,

- Consider starting by managing and reducing power use initially, so the number of batteries and the charging capacity of the solar panel matches the energy and storage needs of energy use - a tricky (not critical) balance - it has to be figured out.
- Make sure there is a reserve because the batteries will last longer if only discharged to one-half level, instead of fully discharging the rated Amp-Hours.
- Select batteries which will supply **twice** the daily Amp-Hours calculated and add in the Amp-hours used during the cloudy days which you expect to be without charging the batteries (suppliers have charts which list cloudy days in your area.).

A standby generator can be a good idea and will help keep the battery and panel size smaller and less expensive. You and your supplier can figure out the economics of bigger batteries and panels vs. the capital and operating cost (fuel, maintenance and replacement).



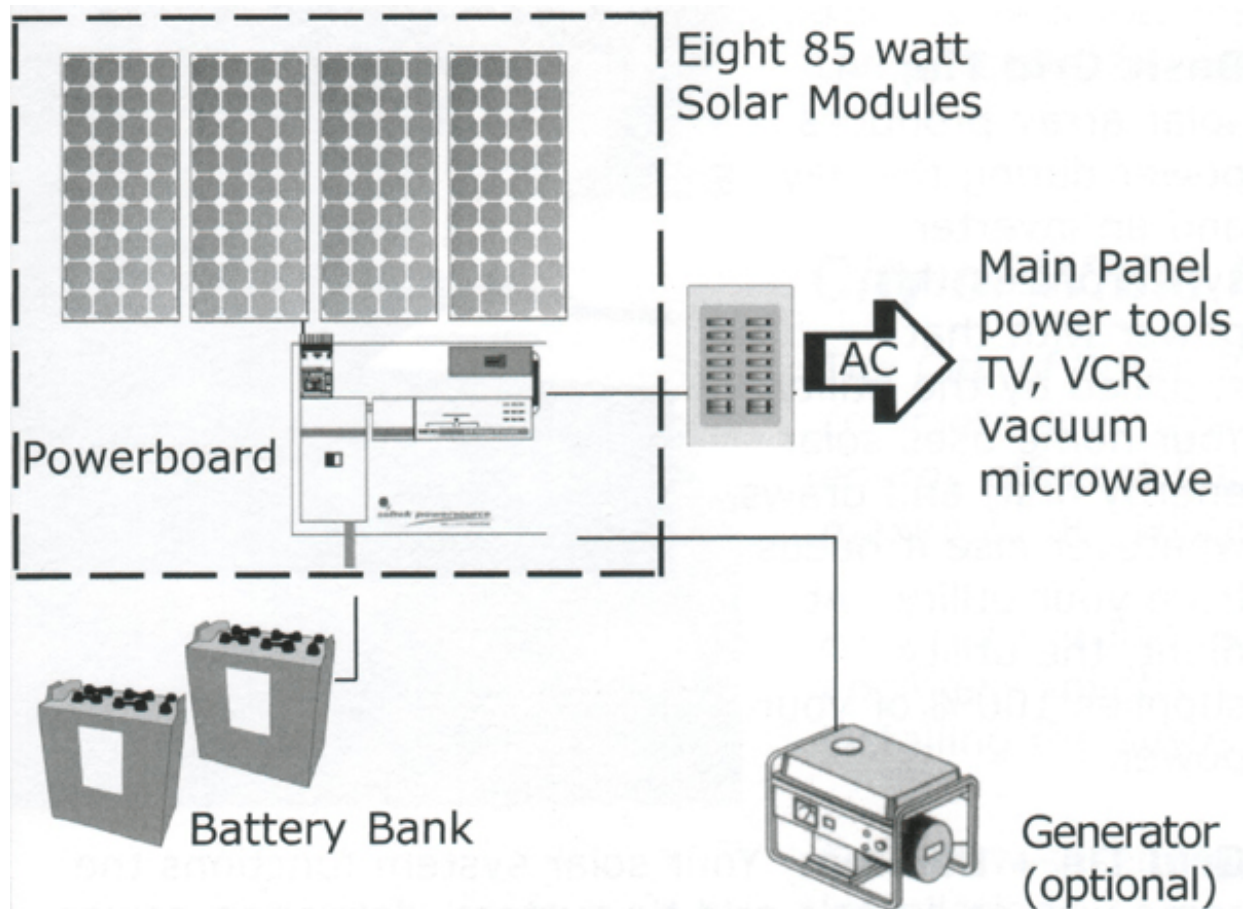
Charging the batteries with solar panels can be figured out the same way.

- Each solar panel will supply 4.6 amps or 85 watts at ideal conditions.
- To charge a one-half-discharged 370 Amp-Hour, six-volt deep-cycle solar battery, will take about ten hours.
- For example, a two-array solar panel will put 185 Amp-Hours of energy back into the battery. Or, five hours with a four-array solar panel system will do the same.

There are cloud cover tables which your local supplier will have, so you can figure out what the deductions from ideal conditions to apply. Then you can figure out how many panels to buy.

There are two new books about Solar PV, published in BC by New Society Publishers,

- [URL=<http://www.newsociety.com/bookid/3903>] Renewable Energy Handbook [URL],
- [URL=<http://www.newsociety.com/bookid/3879>] Real Goods Solar Living Sourcebook, 12th Edition [URL].



**Image 8-3 Non Grid Photovoltaic System** *This system is less expensive and will supply power without a grid connection.*

### ZENU©

Oil, and the good life, it gives all of us in the world, will be shortly gone<sup>1</sup>. Within twenty to forty years the entire population will understand that we are almost out of oil. Then we will have less than twenty to seventy-six years of oil left.

That does not mean we will be running out of oil, it means in twenty or seventy-six years there will be no more easy to get oil available - we will be out of oil. Except for the expensive and non-efficient tar sands in northern Alberta, and shale in other areas there will be no cheap oil.

Which means right now is a good time to become ultra-energy-efficient and not use more energy than we produce: I have coined a technology word, ZENU©, which stands for, Zero, Energy, Net, Use. This could be a good way to start living right away.

- Do not use any more energy than you can generate with renewable resources.

Two things should, it seems, happen quickly in the world.

- First become extremely energy efficient, immediately - almost impossible to do quickly enough;
  - This means getting all high efficient appliances,
  - And for lighting we must use day lighting – as much as possible,
  - Construct low energy use buildings,
  - And reconstruct existing building energy hogs.
  - Our transportation should immediately change to, renewable electric with solar chargers, and more efficient hybrids.
- Generate power and put it into the grid.
  - That's right, stay-connected, and sell it back when you generate more than you use - allowed now in many jurisdictions throughout the world.

When you have a sunny day and low energy usage, then you sell it to the power company. When you don't have solar, and/or wind power, then use the power company's hydro electricity or nuclear power.

No cheap fossil fuels will be available at cheap prices like today. Which is why ZENU © is worth a thought. Is it time to have another thought about energy?

### Plan ahead, wiring your log cabin now

Staying on the homestead is not straightforward. Leaving after two years and two months like

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<sup>1</sup>“The End Of Cheap Oil”, Tim Appenzella, National Geographic, June 2004

Thoreau seems to be more the rule than exception for such experiments in living in the wild; the simple life turns out to be a little too simple for some of us.

If your original idea was to use only oil lamps, and Aladdin Kerosene lamps, and your ideas change, then what? And then, someone decides they need a computer, more light, a nice new big refrigerator, or wonders if they could save more if they had a big freezer: the baby, does not have to go out with the bath water.

When you build your cabin, consider giving some thought to future electrical wiring.

### Gravity simple water systems are easy

Planned tank relocation was my idea from the beginning, even before I installed the two-fifteen-gallon tanks (barrels) in the truck. The gravity water system in the truck was a convenience which grew out of my knowledge of plumbing for buildings; it is still a good idea for anyone; we filled the tanks from a water barrel in the back of the station wagon at first: later we pumped water one-thousand feet across the road from the creek.

After the roof was on the cabin, we moved the barrels from the truck to behind our bed, on the second floor; installed regular garden flexible hoses to the kitchen sink, shower, and a propane heater on the first floor of the cabin: our simple system served us well for two years and was easy to install.

The entire relocation did not take more than one-half day. I set the barrels on the redwood stand that I had in the truck; drilled three holes in the floor and ran the hoses where they were hidden. We dumped water from buckets to fill the barrels for a while, then we connected the pipe from the creek where we had a gasoline engine; this worked well for summer.

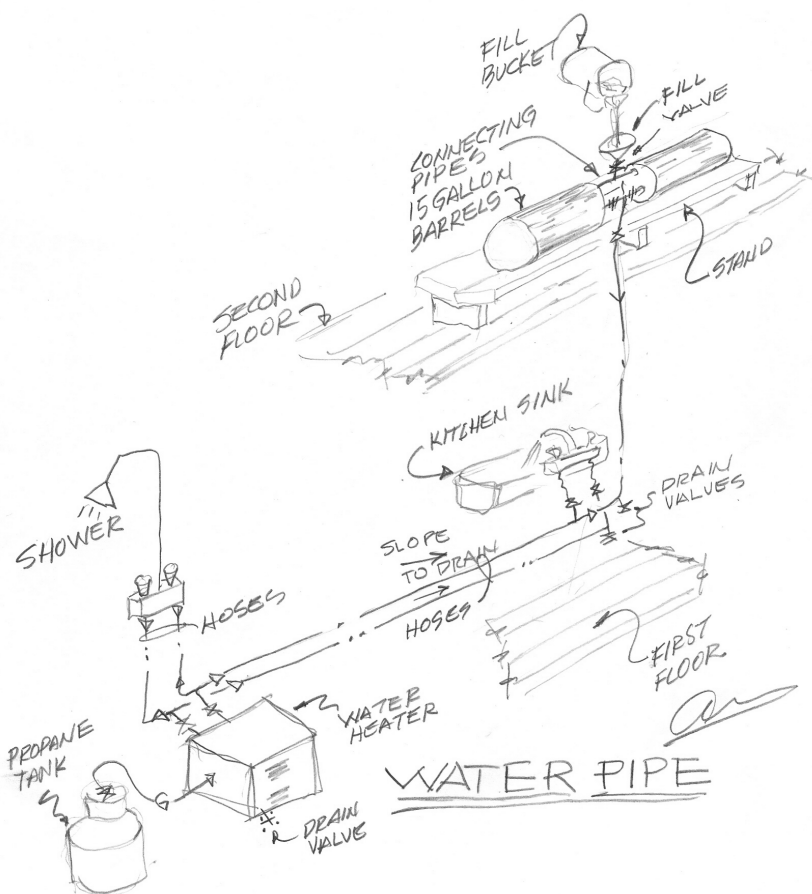


Image 8-4 **Water Pipe Using Hoses** Temporary indoor plumbing.



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by Alexander J. and Nancy J. Boome

The first winter we filled a horse watering trough with snow, and melted it near the stove, then pumped it up with a small electric pump - one of those little transfer-pumps; by this time we had a small *Honda* generator which we operated once in a while for just such tasks. This system is good and I recommend it to anyone who wants to keep their plumbing simple at first.

### A nice, fresh, well-ventilated outhouse with operable windows on two sides

*Skids* are big pieces of wood or logs which you can attach a chain to and pull whatever is on top of them, which we already learned about, like an outhouse: this is a very good idea; dig a hole today, and it will be full sometime; build your outhouse on skids for the future.

An outhouse at first is the best idea, because you don't need water to flush it or power to get the water. If you are in the wilderness, an outhouse is a delightful convenience.

And a nice outhouse, with big windows out to the forest, and with good ventilation makes a very nice second bathroom, which we now use our outhouse for: it is much appreciated.

Put a scoop of lime in the outhouse every time it is used; it will remain fresh and without any unpleasant odor; a six-inch-diameter piece



Image 8-5 **Skidding Outhouse** *The big pieces of wood under our outhouse are skids. We are moving it with a 4WD truck one-mile down a gravel road.*

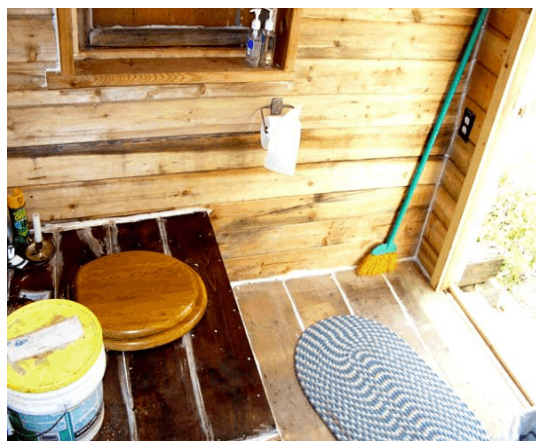


Image 8-7 **Outhouse Inside** Yellow-top bucket is full of lime, one scoop per each use. 1 x 6 T & G pine on inside of insulated walls and roof.



Image 8-6 **Same Outhouse, with Door and Windows in Final Location** Under construction.

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of plastic pipe from below the floor level to two feet above the roof will vent off any immediate odor: combined with the cleansing action of the lime there will be a fresh and pleasant for you every time you enter.

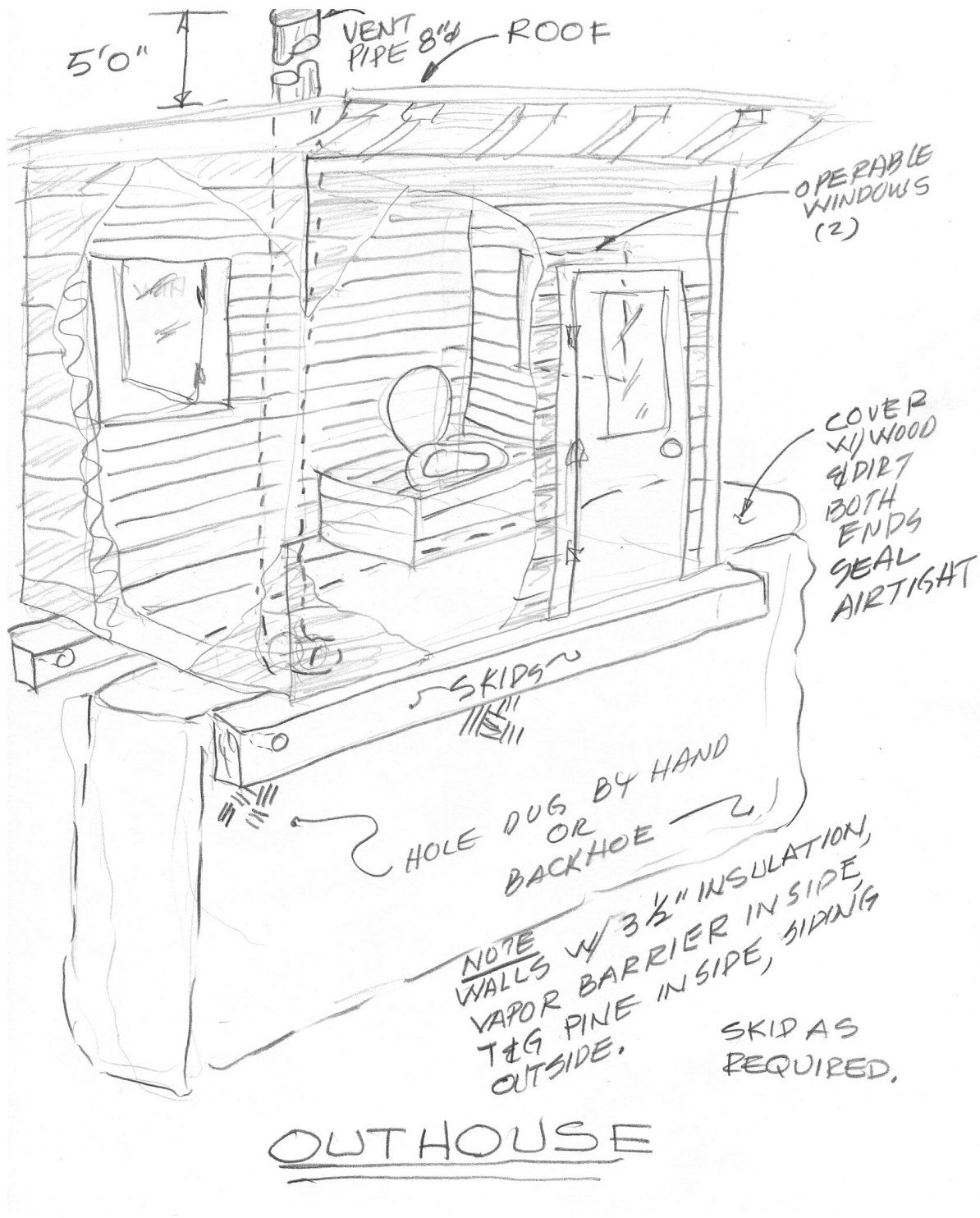


Image 8-8 **Outhouse on Skids, with 8" Vent** The combination of a scoop of lime and an 8" diameter vent make for an always fresh and clean outhouse.



## After a few years you may want indoor plumbing, plan now

Pipe running under the floor to the other side of the cabin carried the waste from the water closet to the 10 feet wide by 10 feet deep by 20 feet long pit, 100 feet away from the house and 200 feet away from the well. The grey water from the sink in the bathroom, the kitchen sink, and the bathtub-shower we piped to a grey water system so we could reuse it.

The time had come to install indoor plumbing; we are all still in love with the simplicity of our outhouse: yet the added winter-convenience of indoor plumbing is appreciated.

Saving grey water is what sold the plan to us; we could pipe it directly to the garden and not waste it. The double plumbing seems worth the effort; we like the indoor plumbing: most people do – not everyone.

## A non necessary nicety, pressure water

Same time and amount of power we use to pump water to barrels, with the now electric pump, we could pump up a pressure system. No extra power consumption is required for the same water use because the pump would shut off when the fifty-pound pressure setting was reached.

And, the span between on and off, of the pump operation, was kept long enough by the pressure tank and the range on the switch that it didn't run that much.

We decided after a few years this was the best idea; it gave us more time for all those projects we would rather complete

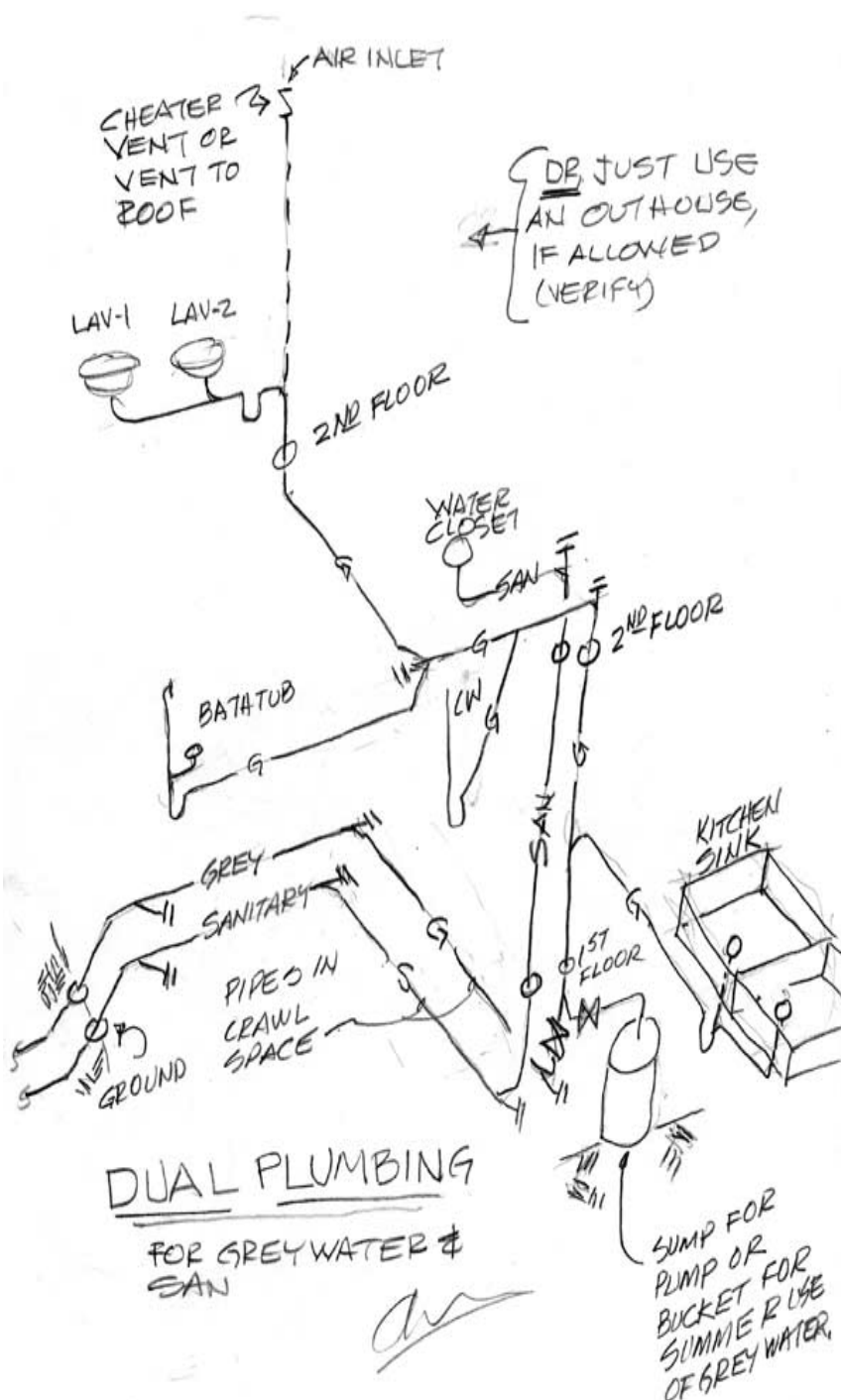


Image 8-9 **Dual Piping for Grey water and Sanitary** If you want to must be separated.

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than run back and forth to a pump to turn it on; water is always present, and we can easily filter it, and keep an eye on the filter. All you have to do is route two pipes, one hot water and one cold water from the pump/pressure system to each of the four fixtures.

We used plastic pipe and it was easy to install; it took one day to put in all the pipe and make it work. We use the water sparingly and only wash clothes when we have a full load.

We have a very low use water washing machine; it uses 65 percent less water and 67 percent less power than a conventional washer uses; the stainless steel drum spins the clothes so dry they hardly take any time to finish on the line.

### Solar, and wood cookstoves for domestic hot water

Collectors of solar energy work well a lot of the time, but they are still expensive.

- The first stages of the water heating on clear days can be the solar panel mounted on south-facing roofs.
- Next pipe the water from the solar heat-exchanger, because we need to pump the fluid – antifreeze – thru the system to prevent freezing in the winter – or shut it off and drain it, next it goes thru the cast-iron side mounted heating coils in the left-hand side of the fire box of the cookstove: pipe the hot water flow thru your regular gas, wood, or electric water tank and heater.

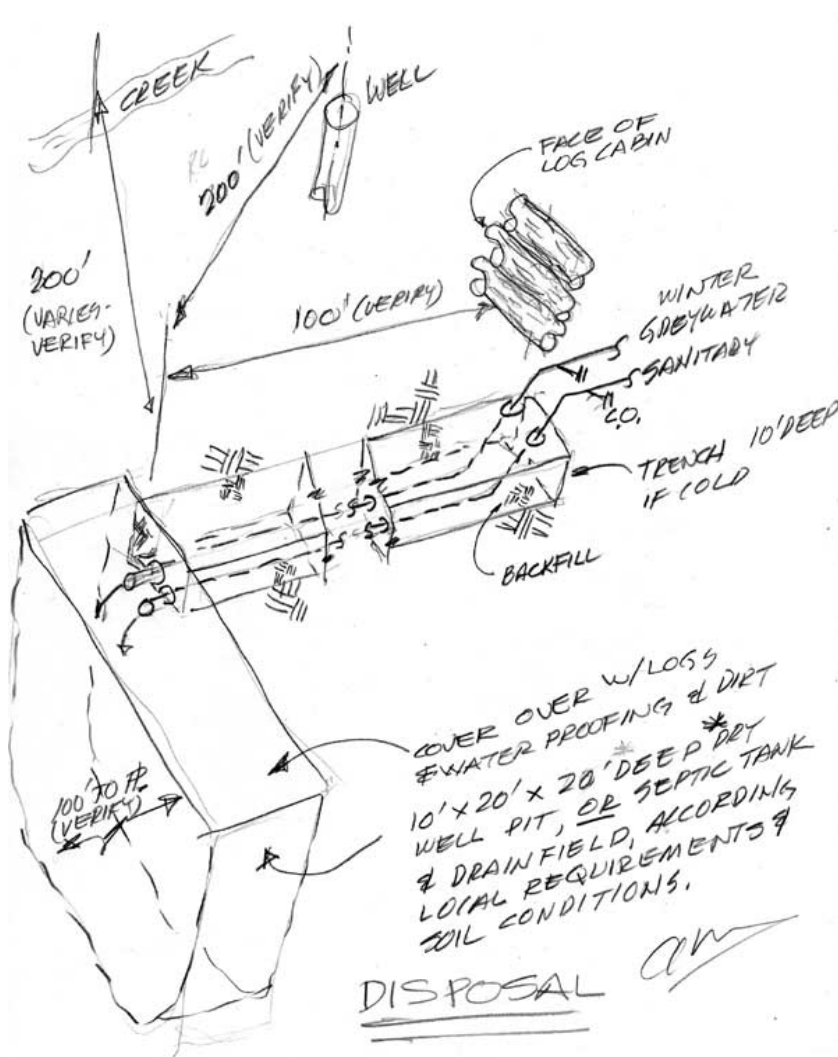


Image 8-10 Sanitary and Grey water Disposal

Wood-fired domestic water heaters will heat ten gallons in twelve minutes with a wood fire<sup>2</sup>

<sup>2</sup>“Mayflower Trading Company”, P.O. Box 38, North Fork, ID, 83466, Tel. 888-235-6293, AquaFire Wood Fired Water Heater, \$600 USD, [www.mayflowertrading.com/water\\_heaters.htm](http://www.mayflowertrading.com/water_heaters.htm),

### Get efficient now and use charging and storage systems

Heavily loaded power systems, unless they are huge, and of course that means expensive, will not work well using Photovoltaic (solar), wind, and water, which are ultimately battery-energy-supply systems.

- Moveable Photovoltaic arrays are the best and collect the most energy from the sun, 25 percent more than static arrays roof mounted:
- You can just buy 25 percent more panels instead of an expensive tracking system which can automatically track the sun.
- Either put the Photovoltaic collectors on a big pole in the yard with proper tracking system for the best system you can have, or buy more panels and be less efficient.

If you put them on a pole, then that leaves your roof free for solar water heating panels, this is an essential part of an overall idea of zero energy net use. All elements should work together, including the connection to the grid to make this idea work.

- It's just like buying a special appliance or something else for the house;
- You didn't **need** it:
- You **wanted** it.

The extra costs can not be justified economically, if grid power is close to your cabin.

### Internet and voice in remoter areas

Future internet and phone are likely to be much different in the future, based only on imagination. The electronic age is everywhere around us; it is an age that sees nothing and accomplishes much.

The past ages have been rather crude, by today's standard, of electronic everything: they progressed from a stone age only a few years ago, and are rapidly moving forward – into unknown ideas and devices dealing with electricity and things of another dimension. A reason for wanting to be on the land is to be where life is simpler: do we need power at all?

Will we figure-out some other wonderful communication method in the near future which will make even the internet, and all the telephone ideas of today obsolete? If you don't have a telephone, don't worry about it: the best two years of my life were when we had no telephone and no grid power – we had our small Honda generator though.

### Six volt battery and a radio



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by Alexander J. and Nancy J. Boome

Time for the *BBC* broadcast and farm reports on the radio, powered by a six-volt battery, which was how we got all the information we need for two years;

- It was a peaceful existence in the cabin;
- Away from it all:
- And in it all.

No distractions of internet, television, videos, or telephones were available, or desired by us; even the children listened and learned the current world events, and then time for dinner, read a story, and off to bed; not – how many hours a day of watching television, or on the net – at what age, three, or so onward – for the rest of our pitiful lives of quiet desperation?

Your choice: mine would be for more time reading, writing, meditating, or quite-reflection. Though we have grid power now, telephone, and internet . . . no television.

### Be careful what you want, and what needs power

Collecting and bringing all the modern ideas to the wilderness is some of the fun; on the other hand that can be a problem too.

“Bring it all with you, and you have the same as where you are,” Vern Hobbs said.

What he meant – I think – is: *it's a ball-and-chain*.

If we were striving for a freedom, by leaving the city, and then take all of the appliances and conveniences with us; then did we get the freedom we wanted? The simple life

- Needs to be simple, doesn't it?
- And one way is to not have power.

The idea of no power, etc. is fine for a while: we have come to the conclusion, the problem is the consumption, not the supplier of power.

### No power, and no plumbing are good ideas

Simple and uncomplicated are what happens when you do not have power, pressure water, or indoor plumbing: there is nothing to fix, or regulate, or prime, or find a leak in. So time and thoughts can be used for higher purposes.

- Without power you get up with the light and work during the light,
- Go to bed at dark.

It takes a strong will to have no power, not just no grid, and not just a generator, because there are so many modern conveniences which require it. Imagine no power – none, not even the beloved Photovoltaic and wind generation – all fraught with all kinds of mechanical and

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electrical repair difficulties. All of our lives are a compromise, somewhere between ideal and acceptable; be prepared, or have strength and fight against the return of some form of power, water, and indoor plumbing.

*In the next Chapter learn how to find out how much water you need and have. Find out how to find water. Learn about harvesting rain water for summer use.*