ADDENDUM A

Water: Zero to Full Competency

Curious how Tier, Stage, and Phase relate? See the Glossary.

Why This Addendum Exists

Chapter 2 tells you what to have and do at each tier of a disruption. It does not tell you how to actually get good at water treatment if you're starting from zero. This addendum is a skill-building curriculum for exactly that: a structured path from no relevant knowledge to genuine, tested competency in Water, built from real Utah programs, certifications, and hands-on practice, not just reading lists.

It's organized by skill stage, not by disaster duration, because building competency isn't duration-bound the way disaster response is. Move through each stage at whatever pace your life allows, and treat the self-check at the end of each stage as the actual gate, not the time spent.

Four stages: Foundations (basic safe practice), Applied Practice (hands-on competence), Self-Sufficiency (independent, resilient skill), and Mastery & Teaching (able to teach others and operate at community scale).

Stage 1: Foundations (Awareness)

Goal: know the core safety facts well enough to not hurt yourself or your household, and understand the landscape of what's ahead. This stage is readable in an afternoon; it's meant to be the floor everyone in the household clears quickly, not a deep skill.

Core Knowledge

The two things that actually matter at this stage: knowing which water treatment method fits which situation, and knowing how much water a household actually needs. Chapter 2's Tier 1 section already covers the practical dosing (bleach, chlorine dioxide tablets); this stage is about understanding why those methods work and where they fail. Boiling kills essentially all pathogens but does nothing for chemical contamination. Chlorination (bleach or tablets) is effective against

bacteria and most viruses but doesn't reliably kill some protozoan cysts like Cryptosporidium at typical household dosing. Filtration mechanically removes particles and many pathogens depending on pore size, but a filter rated for bacteria isn't automatically rated for viruses, which are smaller. No single household method handles every contamination type; that's why the CDC and EPA recommend combining methods (filter, then disinfect) when the water source or contamination type is unknown. See the Water Purification skill guide for the full method-by-method comparison.

Stage 1 Learning Path

Resource	Cost / Format	Notes
CDC Emergency Water Treatment guidance	Free, online	cdc.gov. Read this first; it's the source for Chapter 2's dosing guidance and explains the reasoning, not just the numbers.
EPA Emergency Disinfection of Drinking Water	Free, online	epa.gov. Complements the CDC guidance with the regulatory/technical side of water treatment method effectiveness.

Stage 1 Practice Exercises

- **Do the water math:** Calculate your household's actual daily water need (1 gal/person/day minimum, more for pets, cooking, and hygiene) and compare it against Chapter 2's stored quantity. Most people are surprised how much a 4-person household actually needs for 14 days.
- **Practice the treatment decision:** Given three scenarios (cloudy stream water, tap water during a boil-water notice, water from a compromised municipal line after an earthquake), decide which treatment method or combination you'd use for each, and explain why.

Self-Check: Ready for Stage 2?

You should be able to explain, without looking it up, why boiling and chlorination aren't interchangeable, and state your household's actual daily water requirement in gallons. If that requires a lookup, stay in Stage 1 a little longer; the applied practice in Stage 2 assumes this is automatic.

Stage 2: Applied Practice (Competent)

Goal: move from knowing the theory to having actually done it, under real (if low-stakes) conditions. This stage is hands-on by design; reading about water treatment is not the same skill as having actually treated water. Expect this stage to take a few weeks, mostly gated by getting your hands on the right gear rather than effort.

Applied Practice

- **Practice treatment methods for real:** Actually treat a batch of water with household bleach at the correct dose, and separately with a filter you own. Taste the difference, time the process, and confirm you can do it without instructions in front of you.
- **Build and test a rotation system:** Set up whatever water storage Chapter 2 calls for, and actually run the 6-month rotation cycle once, including relabeling and treating on the way back into storage if using a treatment additive.
- **Practice a boil-water response:** The next time your area issues a boil-water notice (or simulate one), follow it for real: boil for the recommended time, let it cool, and use it, rather than defaulting to bottled water.

Stage 2 Learning Path

Resource	Cost / Format	Notes
USU Extension Food Safety resources	Free, online	extension.usu.edu/foodsafety. Covers the safe-handling side of anything you're treating water to use with.

Self-Check: Ready for Stage 3?

You should have physically completed at least one full water treatment cycle, not just read about it, and you should be able to do it again without referring back to instructions for the core steps. If you've only read the material so far, that's still Stage 1 competency regardless of how much you've read.

Stage 3: Self-Sufficiency (Proficient)

Goal: genuine independence from the supply chain for meaningful stretches of time, the actual skill level Chapter 2's Tier 3 assumes a household has. This stage is a real commitment and produces skills that don't degrade quickly once built.

Self-Sufficiency

- **Understand your legal water sourcing options:** Work through Utah's actual rainwater harvesting rules (up to 200 gallons in up to 2 containers registered for free at waterrights.utah.gov; larger systems need a water right) and, if relevant to your property, research well water rights and permitting through the Utah Division of Water Rights. See the Legal Rainwater Harvesting in Utah skill guide for the full registration process and system sizing.
- **Build redundant treatment capability:** Own and know how to use at least two independent water treatment methods (e.g., a quality filter plus chemical disinfection) so a single point of failure doesn't leave you without safe water. The Building a Biosand Water Filter skill guide covers one low-cost, durable option worth adding to that redundancy.
- **Understand your local watershed:** Know where your area's water actually comes from (Wasatch Front municipal supplies are largely snowpack-fed surface water and groundwater) and what could plausibly contaminate or disrupt it; this shapes which Tier 3 water sourcing options are realistic for your specific property.
- **Build real skill sourcing and testing water outside your stored supply:** Know how to actually haul water from an outside source, test water of unknown quality before relying on it, and collect water from snow, dew, or condensation when nothing else is available, the practical skills behind Chapter 2's Tier 3 self-sufficiency assumption. See the Sourcing & Hauling Water, Water Testing, and Collecting Water From Snow, Dew & Condensation skill guides.

Stage 3 Learning Path

Resource	Cost / Format	Notes
Utah Division of Water Rights	Free registration for small systems	waterrights.utah.gov. The authoritative source for rainwater harvesting registration and well/water-right permitting specific to your property.

Self-Check: Ready for Stage 4?

You should be comfortable making an on-the-spot call about water safety without consulting a reference, and have a real, legally registered (where required) water sourcing plan beyond what's stored in your own home. This is the stage where you become the person your household or neighbors would actually ask.

Stage 4: Mastery & Teaching (Expert)

Goal: the ability to teach others reliably, operate at a scale beyond your own household, and hold professional-level credentials where they exist. This is the stage Chapter 2's Tier 4 (community-scale, shared infrastructure) actually depends on: someone has to be capable enough to lead it. This stage is ongoing rather than something you finish.

Teaching & Certification

- **Understand (don't necessarily pursue) water system operator certification:** Utah's Division of Drinking Water certifies water system operators under Administrative Rule R309-300; a "Small System" (SS) license covers distribution systems serving 25–500 people. Actually pursuing this certification is a serious undertaking (a 100-question exam covering math, operations, pumps, chemical feed, rules, and safety), appropriate only if your community's Tier 4 plan genuinely involves operating a shared water system; know that this pathway exists even if you don't pursue the full license.

Community-Scale Practice

- **Design for a group, not a household:** Take what you've built at Stage 3 (a treatment setup, a legally registered catchment system) and scope out what it would take to run the same thing at 5x or 10x the household scale; the constraints are different (labor coordination, equipment sharing, maintenance logistics), not just "more of the same."
- **Build the infrastructure described in Chapter 2's Tier 4:** Chapter 2 calls for shared or expanded water infrastructure with an agreed maintenance plan; Stage 4 is where you're the person capable of building, maintaining, or teaching that infrastructure rather than just listing it as a goal.
- **Mentor, don't just instruct:** A one-time demonstration teaches a technique; ongoing mentorship (checking in on someone's first filter build, walking a neighbor through registering

their own catchment system) is what actually transfers competency reliably. Build at least one real mentoring relationship, not just a teaching credential.

Stage 4 Learning Path

Resource	Cost / Format	Notes
Utah Division of Drinking Water operator certification info	Free to research; exam fees apply if pursued	deq.utah.gov, Administrative Rule R309-300. Worth understanding the framework even if community-scale water operation isn't your specific Tier 4 plan.

Self-Check: Have You Actually Arrived?

The real test of Stage 4 isn't a credential; it's whether someone else has successfully learned a skill from you and can now do it independently. If you've taught at least one person to safely treat and store water and they've since done it again without you, that's the actual signal, more than any certificate on its own.

At a Glance: Water Deep Dive

A single-page reference for planning purposes. This does not replace the detailed guidance above; use it to see how the four stages scale, and cross-reference against Chapter 2's tiers, which describe what a household needs to have and do rather than how skilled it needs to be.

Stage	Focus	Key Milestone	Primary Resource
Stage 1: Foundations	Core safety knowledge, no hands-on requirement yet	Can explain water treatment method limits from memory	CDC/EPA guidance
Stage 2: Applied Practice	Hands-on, low-stakes repetition	Completed one full water treatment cycle	Direct practice
Stage 3: Self-Sufficiency	Independent, legally registered sourcing	Holds a legal, redundant water plan beyond stored supply	Utah Division of Water Rights
Stage 4: Mastery & Teaching	Teaching others, community/professional scale	Has taught someone who has since succeeded independently	Utah Division of Drinking Water