How to read your reef ICP results, whatever lab you used.

The report is back and it is forty numbers, half of them elements you have never dosed for. This guide covers the groups, the unit trap that causes fake emergencies, and the reading order that keeps you from panic-dosing. Lab-agnostic on purpose: ATI, Triton, Oceamo, Fauna Marin, Reef Labs, same structure, same traps.

The short version

- **Read in this order:** salinity, then alkalinity, calcium, and magnesium, then nutrients, then contaminants, then traces. Most reports are laid out in almost the opposite order of importance.
- **Trace elements are usually reported in µg/L**, which is parts per billion, not ppm. Divide by 1,000 before you compare to any number you know.
- **Use the target ranges printed on your own report**, not the forum's. Labs calibrate differently and their published ranges genuinely disagree, sometimes with themselves.

What is actually on the report

Strip away each lab's branding and every ICP report is the same four groups of numbers, each answering a different question.

GROUP	WHAT IT ANSWERS	HOW FAST TO ACT
Majors **salinity, alk, Ca, Mg, Na, Cl, K, Sr**	Daily stability. What your corals experience every hour. Cross-check against your hobby kits.	First. Nothing else matters until these hold steady.
Nutrients **nitrate, phosphate**	The biological engine: feeding, export, bacterial activity. Labs may measure P and calculate PO4.	Second. Extremes explain more coral symptoms than any trace deficiency.
Contaminants **Cu, Al, Sn, Pb**	The actual emergencies. Elevated metals are toxic below hobby-kit visibility and point to a source.	Fast, but hunt the source before dosing anything.
Traces **I, Fe, Mn, Zn...**	Fine-tuning for a tank that is already stable. The long tail that makes ICP feel worth the money.	Last. One or two at a time, then retest.

The µg/L trap

This causes more forum panic than everything else combined. Major elements are reported in mg/L, which is the same thing as ppm. Trace elements are usually reported in µg/L, micrograms per liter, which is parts per **billion**. One thousand µg/L equals one ppm.

> EXAMPLE: an iodine reading of 60 µg/L is 0.06 ppm, right in the neighborhood of natural seawater. Read that same 60 as ppm and you would believe your tank held a thousand times the normal level. People make this mistake, dose or water-change against it, and then wonder why the tank got worse. **Before you react to any trace number, check the unit column first, every single time.**

The same discipline applies to “not detected.” Every instrument has a detection limit; a zero means “below what the machine can see,” not “absent from your tank.”

Why your lab’s ranges don’t match the forum’s

ICP instruments are calibrated against a reference solution, and labs make different choices about that reference. Those choices measurably shift the output. On top of that, each lab publishes its own target ranges built from its own data and husbandry philosophy. Even a single lab can disagree with itself: Triton’s method page lists magnesium at 1250 to 1350 ppm while its own FAQ says 1320 to 1370.

The practical rule: **use the range printed on your own report, from the lab that ran your sample.** Pick one lab and stay with it. Your trend over time with one instrument is real data; a jump between two labs is mostly noise. Your third test with the same lab tells you more than your first tests with three different ones.

The reading order that keeps you sane

01 · SALINITY

Every major element scales with salinity. If salinity reads 33 instead of 35, calcium and magnesium will read proportionally low, and “correcting” them individually is dosing against a measurement artifact. Fix salinity first, then re-read the majors in that light.

02 · ALKALINITY, CALCIUM, MAGNESIUM

The big three drive calcification and daily stability. If alkalinity is meaningfully out of range, nothing else on the report matters yet. No trace correction survives an unstable alkalinity.

03 · NUTRIENTS

Nitrate and phosphate at extremes explain more coral symptoms than nearly any trace deficiency. Pale, slow-growing corals in a zero-nutrient tank do not need iodine. They need food.

04 · CONTAMINANTS

Scan copper, aluminium, tin, lead. Anything elevated deserves a hunt for the source (corroding pump, metal clip, contaminated rock, source water) before you dose anything. Dosing into a contaminated tank is decorating a problem.

05 · TRACES, ONE OR TWO AT A TIME

Correct one or two elements, wait, retest. Correcting six things at once means your next report cannot tell you which correction did what, and you have bought an expensive test that can no longer answer questions.

When your next report lands

Open it, check the units, and walk the order: salinity, big three, nutrients, contaminants, traces. Write down at most three actions, sized conservatively, and put a retest date on the calendar before you dose anything. A report read this way is a planning document. A report read top to bottom in a panic is a shopping list, and the shopping list mostly benefits whoever sells the bottles.

SKIP THE HOMEWORK

Rather have the reading done for you? That is literally what Decode is. Upload results from any lab, add your tank profile and photos, and get one prioritized written plan with the reasoning shown and a retest date attached. $39, one time. Not a chatbot subscription.

bioforgesystems.com/decode