

South West Wetland Monitoring Program
Procedure for measuring Conductivity / Salinity in laboratory
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Equipment – set up in laboratory:

- Orion 5 Star Conductivity Meter
- Distilled water (4 x 4l bottles), spray bottle filled with distilled water
- Large container filled with tap water and large basin underneath for waste
- Tissues x 2 boxes, paper towel for drying hands and benchtop
- Jugs - small (600ml) and large (1000ml)
- 100ml syringe
- 500ml sample pots
- Marker pen, biro, ruler & Red Lab (ledger) book for recording results
- A couple of days prior to analysis set air-condition on in laboratory to stabilise samples to 25C.

Check “SETUP” of Conductivity Meter:

Refer to Orion Star Series Meter User's Guide – Conductivity Technique. Conductivity setup:

1. Turn on Conductivity Meter and press 'Setup' button.
2. Press up and down arrows to scroll through Setup Menu until **COnd** is displayed on top line.
3. Press 'Line select' button to accept selection and move arrow icon to middle line.
4. Use up and down arrows to scroll through Conductivity settings:
 - a. **tC** Temperature compensation, set to **LIn** (Linear)
 - b. **COEF** Temperature coefficient for **LIn**, set to 2.1 % / C.
 - c. **tdSF** TDS Factor for Total Dissolved Solids, set to 0.49
 - d. **CELL** Conductivity Cell Constant, set to 0.475
 - e. **trEF** Reference temperature for temperature compensation, set to 25 C.
 - f. **tYPE** Conductivity cell type, set to Std
5. Press 'Line select' button to accept selection and move arrow to bottom line.
6. When complete press 'Measure' button to save and return to measurement mode.

Calibration of Orion 5 Star Conductivity Meter (to be done each day before starting):

1. Turn on Orion and press 'Line select' button to select COND.
2. Press CALIBRATE. Cond Cal is displayed.
3. Rinse probe with tap water, spray with distilled water and wipe dry with clean tissue.
4. Place probe in 1.413 mS/cm standard solution sample pot. Wait for Cal 1 to stabilize on 1413uS/cm.
5. Press CALIBRATE. Cal 2 is displayed.
6. Remove probe, rinse probe with tap water, spray with distilled water, wipe dry with clean tissue.
7. Place probe in 12.9mS/cm standard solution sample pot. Wait until 12.9 mS/cm displayed.(2 point calibration completed). Press MEASURE to save and end calibration.
8. Remove probe, rinse with tap water, spray with distilled water, wipe dry with clean tissue.
9. Place probe in 111.9 mS/cm standard solution sample pot (to test calibration OK). Record reading given and temperature.

Analyse all samples:

1. Rinse probe with tap water then spray with distilled water and wipe dry with tissue.
2. Place probe into sample pot, press 'Measure' and wait for reading to stabilize (check reading is COND).
3. In Laboratory Book record wetland, date, conductivity value (and units), temperature, salinity ppt, and mg/l (Note that the salinity values displayed on the Orion are only to 1 decimal place). Use the down arrow to toggle through values for each sample (us/cm, ppt, mg/l etc), conductivity is displayed in **mS/cm** or **uS/cm**, the icon stops flashing when a stable value is reached, ensure you record the correct units for each parameter.
4. Mark lid with marker pen when sample done, replace lid tightly.
5. Repeat until all samples have been analysed. Highly saline samples will not display salinity values in ppt and mg/l. Set aside samples with conductivity greater than 10 000mS/m (70ppt) for dilution and retesting.

Dilution of highly saline samples (1:20):

1. Select sample to be diluted. Rinse 100ml syringe in tap water then distilled water, shake dry, extract 20ml from sample pot and squirt into 600ml jug (rinsed in tap water then distilled water and shaken dry). Replace lid tightly on sample.
2. Fill jug to 400ml line with distilled water (20ml in 400ml = 1:20 dilution).
3. Analyse sample as detailed above.
4. Rinse probe in tap water then spray with distilled water, place in large jug filled with distilled water while preparing next sample.