

LIBERTYCES FIELD REFERENCE

# THE WASTEWATER PH SYSTEM SPECIFICATION CHECKLIST

7 critical decisions pulled from a real installation — built for  
plant managers and facility engineers who need to  
evaluate, spec, or audit an automated pH neutralization  
system without the vendor spin.

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## DECISION 01 — DAILY EFFLUENT VOLUME & FLOW RATE

Undersized holding tanks create overflow and compliance bypass risk. The system must be sized against your actual peak flow, not average daily volume — a plant running batch discharges can see momentary flow far above its daily average.

| System Class        | Typical Daily Volume | Configuration                                                |
|---------------------|----------------------|--------------------------------------------------------------|
| Compact Batch       | Under 10,000 GPD     | Single-stage batch neutralization                            |
| Mid-Size Continuous | 10,000–40,000 GPD    | Two-stage automated, FOG tank + treatment stage              |
| Large Continuous    | 40,000–125,000+ GPD  | Multi-stage with redundant dosing and full SCADA integration |

## DECISION 02 — INLET PH & TARGET DISCHARGE RANGE

Your POTW (Publicly Owned Treatment Works) permit sets the floor — but designing exactly to the permit minimum leaves no margin for dosing variability. Design 1.0–1.5 pH units above the minimum requirement. Because pH is a logarithmic scale, a swing from 5.0 to 4.0 represents a 10x change in acidity, not a 20% change — small dosing errors near the discharge limit carry outsized compliance risk.

| pH Reference Point                 | Value      |
|------------------------------------|------------|
| Federal pretreatment floor         | 5.0 pH     |
| Typical municipal minimum          | 5.5 pH     |
| Recommended target discharge range | 5.5–6.5 pH |
| Neutral                            | 7.0 pH     |

## DECISION 03 — TANK SELECTION & SECONDARY CONTAINMENT

Single-wall tanks in aggressive chemistry are a floor spill waiting to happen. Verify polyethylene compatibility against your specific acid or caustic concentration, and specify double-wall or bermed secondary containment sized to at least 110% of the primary tank's volume — consistent with EPA/SPCC requirements.

## DECISION 04 — DOSING PUMP & MIXER PAIRING

pH overshoot is the most common automated system failure. A dosing pump without continuous mechanical mixing creates localized concentration pockets that give false pH readings — the controller sees a stable reading while the bulk tank is still off-target, then overcorrects. Continuous mixing and a

properly turned-down dosing pump (matched to tank volume and flow rate) are a required pairing, not independent decisions.

## DECISION 05 — LEVEL MEASUREMENT IN CORROSIVE TANKS

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Contact sensors (floats, contact transducers) degrade fast in acidic or alkaline environments — the wetted sensor component is directly exposed to the same chemistry attacking the tank. Non-contact radar level sensing avoids this failure mode entirely and provides a more reliable transfer trigger for automated systems.

## DECISION 06 — CONTROLLER, AUTOMATION & IIOT REPORTING

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Automated compliance discharge logging requires more than a basic on/off controller. Verify the system includes remote monitoring, alarm integration for out-of-range conditions, backup power for continuity during outages, and a process controller capable of the specific dosing logic your discharge permit requires.

## DECISION 07 — FLOW MEASUREMENT FOR COMPLIANCE DOCUMENTATION

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Your POTW can dispute unverified discharge volumes. Magnetic flow meters (magmeters) generally outperform paddlewheel meters in industrial wastewater service — paddlewheel meters are more susceptible to fouling and mechanical wear from suspended solids. Whichever meter you select, totalizer data must sync directly with your compliance reporting system, not be manually transcribed.

## BONUS — PRINT-READY ONE-PAGE AUDIT SHEET

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Bring this to your next vendor meeting, internal review, or site walk.

|                                                                          |                                                                                                          |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 01 — Daily volume & peak flow sized correctly                            | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |
| 02 — Target discharge range set 1.0–1.5 pH above permit floor            | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |
| 03 — Tank material verified + secondary containment 110%+                | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |
| 04 — Dosing pump turndown matched to continuous mixing                   | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |
| 05 — Non-contact radar level sensing specified                           | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |
| 06 — Remote monitoring, alarms, and backup power confirmed               | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |
| 07 — Flow meter type verified + totalizer synced to compliance reporting | <input type="checkbox"/> Yes <input type="checkbox"/> In Progress <input type="checkbox"/> Not Addressed |

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This checklist reflects general field experience and is not a substitute for a project-specific engineering review and your facility's actual discharge permit requirements.