Appendix C. Compliance Findings

Compliance findings and recommended resolutions for structural fire, Wildland Urban Interface (WUI), and life-safety programs across the Grand Canyon National Park (GRCA) are listed in the table below. These recommendations are intended to close identified gaps in policy, governance, and implementation. Recommendations have been provided as guidance for system and program improvement.

Finding	Recommendation
GRCA annual fire/life-safety inspections were no completed park-wide for structures, housing, concessions, and storage.	Update Structural Fire Management Plan (SFMP) with mandatory annual inspection schedule/calendar. Designate backup Park Structural Fire Coordinator (PSFC) during vacancies.
Life-safety deficiencies were not tracked to assess completion in an integrated system (e.g., Facility Management Software System (FMSS), Project Management Information system (PMIS)).	Establish a centralized deficiency log with scheduled PSFC reviews. NPS approval should be required before closure.
Hydrant flow testing and maintenance did not demonstrate annual National Fire Protection Association (NFPA) 291 compliance.	Catalog all fire hydrants and contract annual NFPA 291 testing per Fire Department Regulatory Agency (FDRA) guidelines.
Emergency lighting and exit signage were not tested at required intervals.	Add testing as required to master Computerized Maintenance Management System (CMMS) calendar.
Structural PPE (Personal Protection Equipment) sustainment did not include a second set per NFPA 1500.	Inventory PPE and procure backups per NFPA 1500.
Fire hose testing and records did not demonstrate annual NFPA 1962 compliance.	Schedule annual hydrostatic and flow testing, and document in Structural Fire Database Management System (SFDMS).
A park-wide WUI defensible-space register and zone ownership model were not established.	Define defensible space zones (NPS vs. concessions) in SFMP addendum and concession Operating and Maintenance preseason orders.
Vegetation and fuel mitigation work lacked consistent execution.	Implement an annual WUI fuel reduction plan with assigned zones/owners.
Structure hardening verification (roof, siding, vents, gutters) was not consistently inspected and tracked for WUI readiness.	Establish an annual International Wildland Urban Interface Code (IWUIC) style roof/siding/vent inspection schedule for Class A rating.
Respiratory Protection Program (RPP) medical evaluations and fit testing were not current and could not be reliably validated.	Schedule and maintain records of annual required preseason RPP evaluations.
Self-Contained Breathing Apparatus (SCBA) rosters, qualification logs, and inventory were not centralized or auditable.	Create centralized SCBA roster (names, qualifications, fit inspections) and integrate with SFDMS. Perform required monthly Environmental Health and Safety EHS cross training.
SCBA breathing air sampling did not meet quarterly Grade D verification requirements.	Add Grade D SCBA breathing air sampling as required to master CMMS calendar.

Immediately Dangerous to Life or Health (IDLH) entry readiness (2-in/2-out, HAZMAT/SCBA qualifications) lacked documented proof and training records.	Document HAZMAT team qualifications (Firefighter I, HAZMAT, SCBA), annual provided refreshers (NFPA 472), and 2-in/2-out Standard Operating Plan (SOP) with names.
Post incident medical evaluations and chlorine team fit testing were not completed or documented after the January 15, 2025 leak.	Conduct immediate medical evaluations and fit tests for chlorine team and log in RPP file within 30 days.
A chlorine Process Hazard Analysis (PHA) was not completed as required by Occupational Safety and Health Administration (OSHA) 1910.119(e).	Annually conduct and document PHA per OSHA regulations by identifying hazards (release/exposure), consequences mitigation.
A chlorine system equipment Mechanical Integrity (MI) program was not established as required by OSHA 1910.119(j).	Establish equipment inventory, monthly inspection schedule, and maintenance logs. Perform annual hydrostatic testing on cylinders per Department of Transportation (DOT).
Chlorine system modifications Management of Change (MOC) process for not established as required by OSHA 1910.119(l).	Create MOC form and procedures. MOC requires engineering review, safety sign-off, documentation, and annual training.
Chlorine system operating procedures (normal, emergency) were not formalized to Process Safety Management (PSM) standard as required by OSHA 1910.119(f).	Formalize chlorine system SOPs (normal ops, startup/shutdown, emergency response, leak procedures) with an annual review. Complete training per OSHA 1910.119(g).
PSM compliance audits were not conducted and documented as required by OSHA 1910.119(o).	Conduct biennial compliance audit (internal or third-party) with documented findings, corrective actions, and closure.
A Risk Management Plan (RMP) filing was not documented or submitted as required by 40 Code of Federal Regulation (CFR) 68.160.	File RMP with Environmental Protection Agency (EPA) (South Rim only, 4,500 lbs) including a hazard assessment, prevention program, and emergency response program.
A formal RMP hazard assessment (worst-case/alternate scenarios) was not completed or documented as required by 40 CFR 68.25.	Conduct worst-case scenario analysis (full inventory release impact) and alternate scenario analysis (credible release).
A RMP prevention program was not documented or implemented as required by 40 CFR 68.42.	Detail and link to PSM preventive measures including equipment maintenance, SOPs, training, and compliance audits.
Tier II chemical inventory reporting was not completed or retained as required by Emergency Planning and Community Right-to-Know Act (EPCRA) Sections 311–312.	File Tier II annually (Dec 31 deadline) including chemical inventory, location, quantities, emergency contact.
A release reporting SOP for EPCRA Section 304 notifications was not established for reportable quantities.	Establish release reporting SOP to include greater than 10 pounds to triggers notification to Local Emergency Planning Committee, State Emergency Response Commission, and National Response Center within 15 minutes.

Chlorine system alarm notification was only through Supervisory Control and Data Acquisition (SCADA) and lacked an auto dialer notification pathway.	Create interim manual notification SOP (staff monitor SCADA) and Trans Canyon Water Line auto dialer to utilize in interim.
Alarm acknowledgement and silencing lacked operator attribution and audit logging.	Upgrade SCADA logging to capture operator identification on alarm silence or create manual log (name/time/action).
GRCA developed area fire flow capability (e.g., 1,000 gallons per minute (gpm)) was assumed but not verified through hydrant flow testing.	Perform annual NFPA 291 hydrant flow tests and compare to Lodge requirement. Certification must be signed by Utilities and PSFC.
A complete hydrant inventory, performance, and maintenance database was not maintained.	Create hydrant inventory (all locations cataloged). Map in Geographic Information System (GIS) and include test results.
Seasonal system drainage and reconnection lacked an impairment management and verification plan.	Follow NFPA 25 impairment SOP for preseason drain notification.
Utility outage communications and escalation protocols did not consistently include PSFC.	Designate Utilities impairment coordinator. Notify PSFC within one hour of outage onset.
Fire suppression sprinkler systems were shut off without formal preapproval and impairment management controls.	Follow mandatory impairment SOP with PSFC preapproval before any fire suppression shutoff and document activity.
High threat cross connection control non-compliances remained open without a prioritized mitigation plan.	Prioritize backflow repairs (multi-residential first).
Asbestos inventories and responder briefings were not available or were inaccurate.	Conduct annual asbestos surveys of National Historic Landmarks (NHL) and historic structures and document in SFMP addendum.
Entry controls and PPE qualification requirements for asbestos impacted areas were not established or verified.	Follow OSHA guidance.
Post-fire air sampling and clearance criteria were not documented to support safe re-entry.	Complete post-incident air sampling and follow established abatement plan, if needed. Re-entry sign-off required by Safety and PSFC.
Annual life-safety inspections and independent concession compliance were not produced/verified.	Establish a master CMMS calendar to track and verify inspections and compliance activities, including regular audits.
NFPA 291 testing and clear zone ownership was not established.	Catalog annual hydrant tests, including a register of zones/”owners”.
A centralized closure process was not implemented to track deficiencies.	Establish a centralized log for deficiencies, including standardized approval workflow and quarterly reviews.
RPP current evaluations/fit tests and cross-program coordination were not completed.	Establish a central roster (SFDMS), include annual refresher and cross-training.

PSFC/Fire notification were not timely/did not have a defined escalation window.	Reaffirm NFPA 25 coordinator role. Notify PSFC/Fire SOP with a 1-hr window.
NFPA 291 testing, inventory, and pre-season verification were not completed.	Complete hydrant O&M per NFPA 291. Recommend completion of a hydrant inventory in a geospatial repository, re-verify pre-season.
Coordinated impairment controls for valve operations and PSFC notification processes did not exist.	Implementation of a pre-approval SOP that includes mandatory PSFC notification before valve operations.