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Cascadia Subduction Zone Catastrophic Annex

ESF 3 – Public Works and Engineering

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ESF 3. Public Works & Engineering

ESF 3 Tasked Agencies	
Primary Agency	Oregon Department of Transportation (ODOT)
Supporting Agencies	Department of Administrative Services (DAS) Department of Consumer and Business Services (DCBS) Department of Environmental Quality (DEQ) Department of Geology and Mineral Industries (DOGAMI) Oregon Military Department (OMD) Department of State Lands (DSL) Water Resources Department (WRD)
Adjunct Agencies	Oregon Water/Wastewater Agency Response Network (ORWARN)

1 Purpose

Provide public works and engineering assistance to local jurisdictions responding to the effects of a Cascadia Subduction Zone earthquake and resultant tsunami.

2 Scope

ESF- 3 provides pre-damage and post-damage inspection and assessment, technical advice and evaluations, engineering services, construction management and inspection, provision of potable water and provision of emergency power. Other support includes response and recovery actions related to clearance of debris, restoration of critical infrastructure, demolition or stabilization of damaged structures, technical advice and assistance, construction management, contracting, real estate services and damage assessment.

3 Roles and Responsibilities

3.1 Primary Agency

3.1.1 Oregon Department of Transportation

Priorities

- Assess damage to roadways, bridges and tunnels and begin work on all that have been impacted. Can have impact on public works repair due to location of facilities and lines dependent on access. Response becomes recovery as roadways are made accessible and serviceable to get to impacted communities;
- Provide assistance to counties and local municipalities as support. (Oregon Public Works Emergency Response Cooperative Assistance Agreement, a mutual aid agreement signed by 219 State and local public works agencies in Oregon.);
- Identify heavily impacted areas and prioritize their repair;
- Identify and acquire heavy equipment and engineering resources to reach impacted areas;
- Roadway repair priorities: provide an immediate and complete evaluation of ‘lifeline’ roads. Provide temporary accessibility and repair to make them usable for response and evacuation;

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- Coordinate debris management activities.

Assets

- Public Works Cooperative Assistance Agreement – Statewide (municipal, county and State) agreement;
 - Covers all aspects of public works needs at local and county levels.
 - Assets from local and county levels responding to assist in this event can claim reimbursement. All counties are signatories however not all lower agencies. 219 municipalities are signatories to this agreement.
- Can provide rapid damage assessment with assistance from the Military as well as the Civil Air Patrol to provide aerial reconnaissance and photography;
- Fleet fuel stations located all over the State, at regional and district offices regional. However, ODOT cannot supplement other agencies needs for fuel;
- Agreements with Forest Service and BLM to have access to forest roads for access to heavily damaged areas. Will have to rely on local and county jurisdictions to allow access across private land, potentially through eminent domain;
- ODOT has five regional offices throughout the State responsible for multiple district offices;
- 14 district offices with staff and fleet equipment;
- Pre-identified staging areas for equipment: State Fairgrounds in Salem, large office in Bend, Rest Areas up and down the I-5 corridor are all capable of staging equipment;
- Bend District Office can be used as an alternate AOC for ODOT. All district offices have copies of plans, operation manuals and standard operating procedures to deal with emergencies;
- Technical support branch consisting of: bridge inspectors, other technical specialists, public works support branch, water unit, building inspection, debris management, trucking unit, air transport unit, rail transport unit, water transport;
- Photo / video section provides damage assessment documentation with aerial support from OMD, AERO and CAP;
- Business continuity unit within ODOT AOC;
- Business continuity plans exist with the Department of Motor Vehicles;
- All ODOT facilities and communication centers have generator back up power;
- Regional offices and the AOC have hard wire analog phone capabilities as well as digital;
- There are three ODOT AOC sites in Salem area and one AOC site in Bend. In an emergency, any of the regional or district offices can support an AOC. Within AOC locations, mobile capability exists to enable movement to an alternate site at any time it is necessary;
- ODOT personnel arrive on response with 'go kits' and are prepared to be self-sufficient for a minimum of 96 hours. That includes food, clothing, and whatever personal items that are needed;
- Have MOU's with county public works divisions to provide support;

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- ODOT has multiple bridge engineers, two assigned in every district in the State;
- Two ODOT engineers are trained in structural engineering and are assigned to OSFM USAR teams;
- ODOT Incident Response crews can provide basic hazardous materials response (oil and gas) and traffic control for HAZMAT response.

Capabilities

- Coordinate ESF-1 and ESF 3-related missions in support of the State Emergency Operations Plan;
- Work with other agencies as needed to determine the usable portions of the State transportation system, including roads and bridges, railroads, transit systems, and motor carrier facilities;
- Maintain liaison with the Oregon Chapter of the Association of General Contractors and construction and equipment rental companies;
- Coordinate with the US Army Corps of Engineers to obtain federal public works and engineering support.
- Work with the Oregon AERO in regard to aviation-related response activities, including the use of State owned airports;
- Provide transportation-related public information and mapping support to the Governor's Office, the Oregon ECC, or the lead State response agency, in addition to the public information and mapping support work done within ODOT, during response and recovery activities;
- Coordinate with the U.S. Department of Transportation Region 10 Regional Emergency Transportation Coordinator (RETCO) or designee, to obtain federal transportation support;
- Work with local road authorities and the Federal Highway Administration (FHWA) to implement the Federal-Aid Highway Emergency Relief (ER) program for federal-aid highways in Oregon.
- Coordinate and control emergency highway traffic regulation in conjunction with the OSP, OMD, and the FHWA.
- Maintain liaison with the Oregon Chapter of the Association of General Contractors and construction and equipment rental companies;
- ODOT provides liaisons with FHA, the Federal Strategic Highway Network (STRAHNET) through DOD, USACE, OMD, and USCG;
- Capable of planning, designing and developing roads, highways, bridges and tunnels. Can and will provide this support to local communities as needed;
- Mapping and GIS capabilities;
- Conduct aerial reconnaissance and photographic missions, as requested, provided resources are available;
- ODOT has up to date 'winter' emergency operations plans that are fairly comprehensive emergency operation plans. These operation plans and the emergency operations tool kit are updated before and after every winter;
- Work with DEQ to ensure environmental issues are taken care of when establishing access to coastal communities with temporary or new roadways;

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- Coordination with ESF 10 on providing traffic control and intelligence for oil and hazardous material issues;
- Work with JIC and County Operations Centers to establish public messaging priorities and locations;
- Provide evacuation and security assistance through use of barricades and signage;
- Work in conjunction with ESF 12 to coordinate repairs of roadways that run parallel with energy and communication repairs.

Catastrophic Event Operational Challenges

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- ODOT is not on the list with DAS to automatically receive fuel in this type of an event. Fuel will be critical to run district office generators and for response as well as operation of dispatch centers. There is 25,000 gallons of diesel fuel at the Bend office;
- Loss of communications would be critical. ODOT is part of the State radio system;
- Coordination and communication with public works agencies and responders will be limited and could present a challenge to an organized response;
- Coastal inundation zones – district offices and equipment will be impacted in this scenario. Inland resources will be needed to fill these resource gaps on the coast.

Support Needed Immediately After a Catastrophic Event

- Immediate request for personnel and equipment through EMAC will be needed. Response to this kind of incident cannot be done with the current amount of equipment and personnel;
- ODOT will have immediate needs for additional equipment and personnel. The following areas will be of primary concern: coastal district offices/ personnel/ equipment and cannot be counted on for response in this scenario for Astoria, Warrenton, Seaside, Yachats, Cape Perpetua, Coos Bay;
- Likely be asking for assistance from USN, Coast Guard and other military support to assist with getting equipment and personnel via air or sea into the coastal areas due to expected road damage and coastal inaccessibility from inland;
- Fuel;
- No capability within ODOT of transporting fuel;
- PPE for responding personnel.

3.2 Support Agencies

3.2.1 Department of Administrative Services

See ESF-7 for additional DAS CSZ information.

Priorities

Office of the Chief Operating Officer (COO)

- Establish communications with ECC and other State agencies;
- Provide Public Information Officers with updated information as to the status of State offices and programs that are functional;
- PIO's to establish communications with media outlets;
- Establish communications with Governor's Office;
- Coordinate with other agencies.

Enterprise Technology Services Team

- Establish communications via hard wire, cell phone, lap top computer;
- Ensure electronic mainframe - network capabilities;
- Establish computing environment.

Enterprise Goods & Services Team

- Ensure the State Procurement Officer has access to electronic systems or paper files for contract servicers information;
- Ensure electronic mainframe – network capabilities to establish accounting system to track payment for goods and services;
- Set up and provide 24 hr. State Procurement staffing to be available to make State procurement office purchases and payments as needed.

Enterprise Asset Management Team

- Provide building safety inspections for State buildings;
- Provide mitigation and/or minor repairs if applicable to make buildings usable for State employees and services;
- Provide inventory of usable assets from State motor-pool and surplus storage yard.

Assets

- Motor-pool fleet consisting of approximately 200-275 diverse vehicles including: 4WD trucks, SUVs, and vans;
- Small cache of two way radios;
- Six satellite phones currently distributed to SDC managers;
- State surplus materials can include: police vehicles, State cars, fire trucks, computers, office furniture, surplus military MREs, and various tools. The amount and types of materials varies from month to month;
- Voice Mobile Office kit with a switch, handsets and phone numbers in a box available for emergency use;
- Forklift equipment at surplus warehouse;

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- DAS staff includes drivers with CDLs; DAS Facilities Division has seven journeyman electricians, three HVAC control technicians, and five refrigeration mechanics on staff.
- Some fuel storage at State motor pool, capacity depends on if the tank has just been filled or waiting to be filled;
 - For E-10 and B20, the tanks can get as low as 2,500 gallons each and they are about 15,000 when we bring in a load to fill, sometimes a bit higher. Note: the B-20 and E-10 tanks are below ground and could be susceptible to damage in an earthquake.
 - For E-85, the tank can get as low as 1,200 gallons and a max of 11,000 gallons.
- DAS natural gas fuel system is full as long as the line remains intact, the natural gas fuel system serves as the backup station for the City of Salem bus service – “Cherriot’s”;
- Fleet has one dedicated generator at Fleet and two portable ones. One portable is natural gas powered.

Capabilities

- Manages State efforts to procure or contract for equipment, supplies, services, etc. to meet the needs of the incident;
- DAS maintains a current list of contractors that have been vetted by the State to be able to supply goods and services in a disaster;
- DAS maintains network switches throughout various buildings throughout the State to provide mainframe access to other State offices. If damaged as a result of disaster. the switching systems are designed to bypass damaged locations and re-route messaging to other switches throughout the State to ensure business continuity and identify the areas in need of repair;
- Coordinates salvage operations, adjusts property damage claims and submits those above the retention level to the State's commercial insurers;
- Essential DAS services needed post-incident include:
 - Accounting services;
 - Use of information systems;
 - Process of property damage claims, FEMA claims;
 - State Motor Pool;
 - Facilities lease management;
 - Contracting and emergency procurement;
 - GIS mapping;
 - Printing services;
 - Procuring a site suitable to the collection and distribution of donated goods and materials;
 - Surplus distribution of State and Federal surplus property to State agencies;
 - Repair, operation and maintenance of facilities;

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- Personnel for protective services like sand bags or boarding up buildings and clean up. Electrical, plumbing and structural services could be provided by staff or obtained via contract;
- Re-deployment of State personnel to assist with disaster operations;
- Provision of restorative services including structural, HVAC and electrical systems within State-owned facilities during or after an incident.

3.2.2 Department of Consumer and Business Services

Department of Consumer & Business Services: The department consists of five operating divisions (Building Codes, Finance and Corporate Securities, Insurance, Oregon OSHA, Workers' Compensation) and three support divisions (Information Management Division, Fiscal and Business Services, Directors Office).

Building Codes Division: Ensures safe building construction by adopting and administering uniform Statewide building codes; provides building code and rule interpretation; assists local government building departments; enforces license, code and permit requirements; certifies inspectors and licensing trade professionals.

Priorities

- All DCBS divisions would need to assess their own operational needs and account for personnel;
- Upon request, send liaison to State ECC.

Assets

- The primary facility for the BCD is in West Salem;
- BCD has field offices in Pendleton and in Coquille (Could be impacted by tsunami). Approximately four or five personnel at each location. BCD could reassign some of our field office staff for a short time to supplement staffing. BDC has no ability to house or care for those staff however;
- BCD Inspectors have agency vehicles;
- BCD (in isolated cases) has IGAs with jurisdictions where they provide services on BCD's behalf. Example: In Klamath County, someone is doing prefab construction and shipping those around the State of Oregon. To avoid having to send BCD inspectors down there to inspect every shipment, the local licensing department in Klamath County does it (via IGA) so State BCD doesn't have to travel there;
- Uses the DCBS data network administered by DAS. BCD would be dependent on DAS for restoration of computer access.

Capabilities

- BCD ensures safe building construction by adopting and administering uniform Statewide building codes;
- Enforcing license, code and permit requirements;
- Certifying inspectors and licensing trade professionals;
- Providing building code and rule interpretation;
- Assisting local government building departments;

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- Can provide assistance and expertise on the licensing of electrical, plumbing, elevator and boiler contractors;
- Maintain and provide a current list of building inspectors and design professionals that have been certified in ATC-20 post-earthquake inspection procedures. ATC-20 is a methodology developed by the Applied Technology Council to:
 - Evaluate the extent of damage to structures after an earthquake.
 - Placard buildings to inform owners, occupants and the public if a building is safe to enter and occupy.
- Assists in long term recovery through the normal licensing and permitting process once operations are re-established.

Support Needed Immediately After a Catastrophic Event:

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- BCD has no generator or back up power for their facility;
- BCD communications is dependent on telecommunications and internet;
- Loss of computer and data systems would impact BCD's operations significantly;
- With limited exception, BCD's list of ATC-20 post-earthquake inspectors identifies only Oregon residents that have completed ATC training. A catastrophic seismic event would likely require additional inspectors from outside the State;
- BCD operates under ORS 455 - Building Codes Division. It's uncertain how flexible BCD could be on permitting or licensing post-quake. Emergency response may require Governor's order to waive or relax requirements;
 - There are some provisions in the Code for emergency repairs -within 72 hours as written, too small a window of time for this scenario.
 - Past history in those cases is that the repairs are done and permits can be obtained after the fact.
 - Generally speaking, BCD is not able to ignore the licensing requirements in Oregon.
- Limited engineering capabilities in BCD (one staff member), it is unlikely that they would be able to assist with structural engineering assessment.

Oregon OSHA: Ensures employers understand their responsibilities for protecting their workers, especially during emergency response and recovery operations. Enforces occupational safety and health rules, investigates workplace fatalities, major accidents, and safety and health complaints. Coordinates and performs the actions identified within the Worker Safety & Health Support Annex of the National Response Framework, or State equivalent; provides occupational safety and health technical assistance to other State and local entities; assesses responder safety and health resource needs, e.g., OSHA on-site assistance, incident-specific personal protective equipment protocols, training, safety and health monitoring.

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Priorities

- All DCBS divisions would need to assess their own operational needs and account for personnel;
- Respond to request to send liaison with State ECC.

Assets

- OR OSHA has field offices around State.
 - Location of field offices: Medford, Eugene, Salem, Bend, Portland, and Pendleton (Pendleton is a satellite office).
 - Oregon OSHA Laboratory is located in Portland.
- Vehicles for staff are located at each field office;
- Uses standard communication assets (phones, cell phones, internet);
- Uses the DCBS data network administered by DAS. DCBS/Oregon OSHA would be dependent on DAS for restoration of computer access;
- Operates a nationally certified occupational health laboratory in Portland. This well-equipped lab analyzes samples collected by compliance officers and consultants to determine chemical compositions and concentrations of hazardous substances to which workers may be exposed.

Capabilities

- Oregon OSHA serves as a regulatory agency with Statewide authority over public and private sector operations and work for worker safety. Worker safety and health complaints would be addressed through established enforcement policies and procedures. If there is a worker safety & health issue, Oregon OSHA may be tasked with ensuring an employer takes care of the issue;
- Works with other State departments to answer questions on worker safety and health;
- Provides technical assistance (answering questions, distributing information, etc.) regarding worker safety and health;
- Education and training for responders and workers on dealing with safety and health hazards;
- Oregon OSHA can assist employers in complying with regulatory requirements for personal protective equipment;
- Liaises with Federal OSHA to ensure worker health and safety;
- Mechanisms are already in place to work with Federal OSHA in an earthquake scenario. In the context of disaster recovery, Federal OSHA will work with FEMA on the national level, assisting Oregon OSHA. This would go back through ECC for tracking ;
- Coordinates communication with labor unions, contractors, and other organizations regarding responder safety and health issues;
- Oregon OSHA has a large inventory of sampling equipment for a variety of substances and hazards, and staff trained on their use;
- Can coordinate with Federal OSHA to provide specialized response teams, for example, construction, biological or radiation safety. Access to and availability of

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Federal OSHA specialized response teams is contingent on federal/regional priorities.

Support Needed Immediately After a Catastrophic Event:

- By nature of a catastrophic event, personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- Electrical power backup for the Capital Mall buildings is serviced off the power grid, and OR-OSHA field offices do not have generators for emergency power backup;
- Oregon OSHA communications are dependent on telecommunications and internet;
- Loss of computer and data systems would impact Oregon OSHA operations significantly, however, enforcement citations could be issued through a manual process;
- Might require communication equipment and most likely vehicles, fuel or transport to work locations;
- No private sector contractors that could help with Oregon OSHA regulatory work, which would be bulk of post-quake work;
- Would need to turn to Federal OSHA for assistance, if necessary.

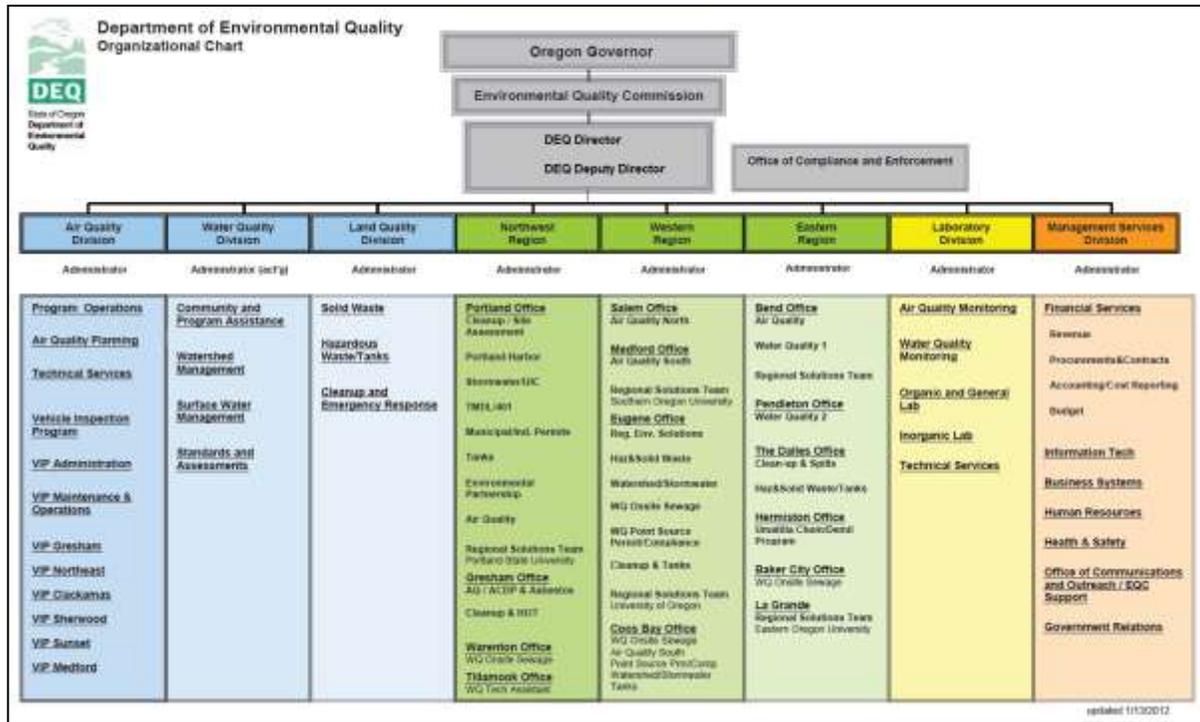
3.2.3 Department of Environmental Quality

Priorities

- Restoration of DEQ response systems to normal;
- Ensure containment and removal oil and hazardous materials from the environment;
- Recovery of hazardous materials containers that become dislodged from their primary installation site, (pesticides, anhydrous ammonia etc.);
- Contact Emergency Response Services contractors for assistance. These Private Sector contractors have DEQ interoperable radios;
- Coordinate with ODOT on clean up and debris removal.

Assets

- DEQ is divided into 3 regions, and 11 branch offices. Headquarters office is located in Portland with major offices and equipment located in The Dalles, Bend and Pendleton;



- Mobile emergency response unit – trailer equipped with generators, satellite communications, computer and voice communications with the trailer. Can run the trailer for a short period of time without supplemental fuels / power;
- DEQ has an on-scene coordinator in each of the Bend and Eugene offices. Two on-scene coordinators are in the Portland office.
- One mobile repeater in the mobile emergency response unit;
- DEQ has boats for fish sampling purposes. Assessing shore line and clean up needs. Majority of the boats are staged in the Portland area;
- Contract with NRC Environmental Services which has assets nationwide to draw from for personnel and equipment.
- Mobile emergency response unit – trailer equipped with generators, satellite communications, mobile repeater, computer and voice communications. Can run the trailer for a short period of time without supplemental fuels ;
- Have a group of employees who hold HAM licenses. DEQ does not use HAM radio in any official way for response;
- Civil and chemical engineers, toxicologists and geologists on staff.

Capabilities

- Coordinate with locals for information regarding damage assessment to hazardous materials holding/manufacturing facilities;
- Oregon Health Authority has the lead on drinking water safety and treatment, DEQ coordinates with local sewerage and Oregon Health Authority on drinking water protection and infrastructure restoration;

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- Issue variances and waivers to local governments for work on water and sewer systems for immediate response concerns;
- Provide technical assistance with nonhazardous waste management; including debris and recycling/reuse;
- Provide expertise on environmental and public health issues related to oil and hazardous material incidents;
- Provide expertise on environmental pollution control techniques;
- DEQ is a member of the Regional Response Team/Northwest Area Committee which publishes the regional oil and hazardous materials response plan, the NWACP, http://www.rrt10nwac.com/nwacp_document.htm. The NWACP serves as the State of Oregon Oil and Hazardous Materials Plan (State of Oregon Emergency Management Plan, Volume II, Part 3);
- MOU's with State parks to remove any oil or hazardous materials that make its way into the parks and scenic waterways;
- MOU with Coast Guard to respond in their zones to abate any oil or hazardous materials;
- MOU with California, Washington, British Columbia, Alaska, Hawaii for personnel and equipment to respond to oil spills;
- Provide assistance and information on decontamination procedures;
- DEQ may assist with hazardous materials clean up;
- DEQ also develops comprehensive plans and programs for air and water pollution control and solid and hazardous waste disposal;
- Coordinate with special teams (OSFM HAZMAT Teams, ODOT Incident Response Teams, USCG, EPA, local emergency responders and others);
- Contract with NRC Environmental Services which has assets nationwide to draw from for personnel and equipment;
- Health and safety staff and job safety contractor for DEQ emergency responders;
- Work with local governments for information regarding damage assessment to hazardous materials holding/manufacturing facilities;
- Have PIO's to interface with JIC and ECC.

Catastrophic Event Operational Challenges

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- Fuel concerns;
- Statewide DEQ communications would be affected by scenario;
- Without fuel and communications primary ESF-10 priorities cannot be met;
- Facility operators will let DEQ know if they have a problem with regard to water/wastewater facilities. Unknown if these operators will be able to report issues.

Support Needed Immediately After A Catastrophic Event

- Would require immediate personnel assistance from outside of the State;
- Power;
- Fuel or transport to work locations;
- Equipment needs:
 - Several mobile labs.
 - Small boats for assessments.
 - Trucks and trailers to establish a storage area.
- Areas for staging equipment within the first 72 hours;
- Personnel responsible to bring their own PPE, replacement PPE for responders would be needed;
- Communications equipment.

3.2.4 Department of Geology and Mineral Industries

Priorities

- Provide liaison to the State ECC when requested;
- Provide technical assistance following a disaster. Specifically, provide field teams to assist following an event, as appropriate.

Assets

- Primary DOGAMI office is located in Portland with approximately 20 personnel;
- Newport office is staffed with four, Baker City office is staffed with one, Albany office is staffed with 11;
- Have one registered engineer, four engineering geologists;
- Agency functions are redundant at all offices;
- Have a data continuity plan with redundant resources that can be operational within 24 hours of the event;
- Have offsite data/information storage with 'Iron Mountain' – a data storage firm.
- Have two satellite phones – one in Portland and one in Baker City office;
- Four field vehicles- three 4WD vehicles, one car;
 - Each field vehicle has an enhanced safety kit.
- Can provide aerial surveys with assistance from CAP or other non-DOGAMI aviation assets;
- Two RTK GPS systems capable of providing information within 1cm accuracy;
- Maintains contract for LIDAR data collection with Watershed Sciences Inc., offices in Corvallis and Portland. Watershed Sciences has 60 employees, three aircraft, and numerous field vehicles. They are a field based organization and can provide technical abilities for field work;
- Extensive GIS abilities to provide mapping of impacted areas and GIS analysis of incoming data;
- Have outreach specialists to augment ESF 15.

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Capabilities

- Can provide advisory services regarding geologic hazards to responding agencies;
- Collection of data that is perishable such as high water marks, ground conditions that are caused by ground movement and ground failure;
- Provide a geologic base for future planning by analyzing the event and its ramifications;
- Interact with ESF-1, ESF-2 and ESF-12 to determine vulnerabilities of infrastructure life lines;
- Acquisition of data and expert opinion on hazard issues and mitigation techniques to any and all stakeholders, partners and agencies;
- Serve as a clearing house for scientific and event data and collection of post event perishable information;
- Have working agreements with USGS, NOAA, FEMA (risk analysis division), ODF, BLM, Bureau of Reclamation, EPA;
- Contacts at major Universities to augment analysis of impact area conditions

Catastrophic Event Operational Challenges

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- Staffing may be at one third due to the nature of the event and the proximity of the work force living near the DOGAMI office in Portland;
- Statewide communications would be affected by scenario;
- Without fuel and communications primary priorities cannot be met;
- Assessment falls to the facility operators to let DEQ know if they have a problem with regards to water/wastewater facilities.

Support Needed Immediately After A Catastrophic Event

- Would require communication equipment and most likely vehicles, fuel or transport to work locations;
- Power. All data resources are computerized and would need power to retrieve and work with;
- Field teams would need accessible roadways, as well as fuel, food, water and a base camp area;
- Trained specialists, scientists, geologists, engineers to supplement available personnel;
- Communications equipment, and computer system repair/replacement.

3.2.5 Oregon Military Department

Priorities

- Immediate assessment of surviving equipment and units available for response (including maintenance facilities);
- Ensure usability and safety of OMD facilities;

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- Establish communications with OMD facilities Statewide and begin implementation of Area of Responsibility (AOR) plans;
- Recall of personnel;
- Identify fuel and communications capabilities;
- The Oregon National Guard may engage in immediate response lifesaving response actions for up to 72 hours at individual unit commander's decision;
- Respond to mission tasking by OEM.

Assets

- ROPER Water purification units located in Portland metro area and Eastern Oregon;
- CERFP (CBRNE Emergency response Force Package) urban search and rescue team would require structural engineer(s) from another agency.

Capabilities

- Assist with potable water transportation and limited distribution;
- Assist with the provision of limited electric power from portable generators;
- Provide heavy equipment and operators, and other resources commensurate with OMD's available and useable resources;
- Repair of damaged roadways (primary function of Albany Oregon unit), would need certified engineering assistance from elsewhere;
- Coordinate with US Army Corps of Engineers on engineering needs;
- Contracts with suppliers of public works assistance.

Catastrophic Event Operational Challenges

- Requirements of public health to certify potable water provided by OMD, specifically the availability of certifying staff;
- Legal issues with purchasing of potable water, only unit capable of ordering bottled water is CERFP, bottled water purchasing would need to be handled through DAS;

Support Needed Immediately After A Catastrophic Event

- CERFP (CBRNE Emergency Response Force Package) urban search and rescue team would require structural engineer(s) from another agency;
- US Army Corps of Engineers provision of engineers and specialists for ESF-3 missions;
- DCERF (Defense Chemical, Biological, Radiological and Nuclear Response Force) providing robust transportation and engineering response (72-96 hours), Title 10 asset.

3.2.6 Department of State Lands

Priorities

- First priority is ensuring life and safety of DSL personnel and ensuring offices are safe for work;
- Provide liaison to State ECC;
- Provide approvals for the use of State lands as necessary for response and recovery.

Assets

- Have three offices, Salem (80 on staff), Bend (10 staff) and South Slough, Coos Bay (15 staff);
- Natural resource specialists on staff;
- Have scientists on DSL Staff that are linked with the Pacific Tsunami Warning Center;
- Can provide GIS analysis and mapping capabilities. Three specialists that can assist as needed with GIS issues and information;
- Have a small fleet of vehicles in Salem - two 4WD vehicles, three sedans and one cargo van;
- Network of instruments in the South Slough that record water surface elevation and other water quality and meteorological parameters.
- Bend office has six 4WD vehicles;
- Have one boat located in Salem with trailer used to do surveys of property along navigable waterways and survey docks;
- DSL administrative office located in the town of Charleston (SE of Coos Bay on the South Slough);
- South Slough DSL office vehicles:
 - Two 4WD vehicles;
 - A one ton tilt bed equipped with tandem rear wheels and a bumper mounted winch (located at the SSNERR maintenance facility);
 - A half ton conventional pickup with four traction tires. (Located on the OIMB campus);
- We have about seven VHF radios with an assigned frequency;
- Two twin axle utility trailers and a 14 hp 4WD diesel tractor equipped with a small front bucket and a three point trailer hitch and power takeoff. This is a smallish “landscape” tractor that fits on the trailers mentioned above;
- South Slough DSL office boats:
 - Smokercraft 18 foot flat bottomed skiff with trailer and steering console, electric start 4 stroke 40 HP, llocated on the Oregon Institute of Marine Biology campus in Charleston (in tsunami inundation zone).
 - Alumaweld 16 foot semi vee hull with trailer and steering console. Electric start 4 stroke 55 HP located on the Oregon Institute of Marine Biology campus in Charleston (in tsunami inundation zone).
 - Valco 16 foot lightweight flat bottom “jon boat” with trailer and 20 HP pull start (location varies between OIMB and SSNERR Interpretive center).
 - Valco 14 foot lightweight flat bottom “jon Boat” without trailer and 15 HP pull start outboard.

Human powered craft including:

- 22’ fiberglass eight passenger canoe with trailer
- Two or three conventional 17’ canoes (three passenger)

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- Three or four Roto molded Kayaks (single passenger)
- Trailer designed to carry four to six paddle craft
- All human powered craft are located at the SSNERR Maintenance facility (outside of the tsunami inundation zone)
- Modified the water supply system at SSNERR's interpretive center to store 2,000 gallons of potable water in two tanks and have another 1,000 gallon potable water storage tank at the Spruce ranch complex near the maintenance facility.
- DSL has access easement agreements with private property owners to gain access to State lands.
- Maintains a data base of all State owned lands.

Capabilities

- Coordinate with the Oregon Department of Transportation when State lands are affected by a disaster or event, including navigable waterways;
- DSL can provide information relevant to wetlands, State-owned forestland and easements that exist in Oregon, as well as other necessary information consistent with the mission of Department of State Lands;
- Provides pre-event tsunami awareness training;
- Administers navigable waterways up to ordinary high water, coast areas – submerged and submersible lands up to three miles out;
- Manages State owned range land and forest lands for income;
- Forest land is managed by the Department of Forestry and timber sales are used to fund education;
- Through the State debris removal plan, tasked with providing State lands for stock piling debris;
- As manager of State owned properties, can use State property to establish staging areas;
- Issue right of way and special use permits for the Army Corps of Engineers, ODOT and other agencies that require access to damaged areas within State lands in Oregon;
- Can assist in the coordination of debris removal;
- Can implement emergency authorization process to allow for emergency removal of debris from waterways without going through the permitting process;
- All staff can be moved to areas of need regardless of area office they are primarily assigned to, or work virtually if offices are damaged and unsafe;
- DSL is a regulatory – land management agency and would provide emergency authorization when and where needed;
- DSL has contracts for legal services, real estate services – appraisals, audit services, technical and natural resource services.

Catastrophic Event Operational Challenges

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as ‘available’ for mission deployment;
- Accessibility to fuel resources;
- DSL does not have mobile operations capabilities. Staff can work from anywhere if there is power and communication connectivity;
- All communications depend on land line, cell phone, and computer e-mail capabilities;
- No capabilities to sustain a crew without a living area, food, water and power;
- Environmental laws that may hinder access to and through State owned lands and water ways.

Support Needed Immediately After a Catastrophic Event

- Fuel for vehicles;
- Getting staff where they need to be due to roadways being compromised;
- Need electricity/telecommunications/internet access for operational capabilities and access to computer databases necessary for operations.

3.2.7 Water Resources Department

Priorities

- Inspection of identified 36 high hazard dams (5 federal dams and 31 under Oregon WRD responsibility) west of longitude 125 degrees. Dams falling under WRD responsibility are municipal, private and Irrigation District owned;

High Hazard Dams West of Longitude 123 degrees		
Dam Name	Latitude	Longitude
Pony Creek - Upper	43.3684196	-124.257607
Pony Creek - Lower	43.3789902	-124.242088
Big Creek Res. #1 (Lower)	44.654911	-124.043793
Big Creek Res. #2 (Upper)	44.6573792	-124.031502
Spring Lake Dam	44.9748802	-124.00502
Olalla Dam	44.6809616	-123.930344
Seaside City Reservoir	45.9523315	-123.920792
Mill Creek Dam (Toledo)	44.5736885	-123.909531
Bear Creek (Astoria)	46.1178818	-123.63987
Middle Res.	46.0949898	-123.617188
Wickiup Lake (Clatsop)	46.0861282	-123.608231
Wageman	43.1040611	-123.59005
Berry Creek Dam	43.0404396	-123.555328
Hult Log Storage Pond	44.2402687	-123.49482
North Fork Dam (Benton)	44.5262909	-123.492928
Mercer Res.	44.9037704	-123.470177
McGuire Reservoir	45.3092308	-123.408653
Trask River Barney Res.	45.4483917	-123.393511
Bear Creek Res. Site 3	43.6199799	-123.372787
Winchester Dam	43.283989	-123.353928

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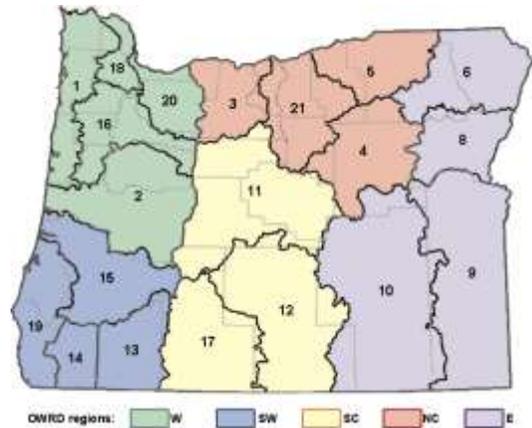
Hayhurst Road Res.	43.6525307	-123.339409
Creekside IWR	42.9343083	-123.306642
Fern Ridge	44.1202393	-123.301918
Creekside Dam #1	42.9384889	-123.298717
Cooper Creek Reservoir	43.3799782	-123.282097
Plat I Reservoir	43.3934517	-123.25441
Scoggins	45.4751816	-123.198624
Galesville Res.	42.8490982	-123.178841
Santa Clara	44.0994492	-123.148628
Updegrave	43.2943802	-123.122131
Applegate Lake	42.0558281	-123.114578
Paris Res	43.2388992	-123.111298
Cottage Grove	43.7159615	-123.050369
Walters, Glenn #5	45.4733315	-123.045097

*dam names in green are federal dams

- These assessments are standardized and can be completed within an hour (longer for concrete dams and long embankments) with perfect conditions. Post-quake and with the likely loss of power and roadways this would take longer to complete;
- Assessments can be done via helicopter;
- Provide technical support to dam owners on damaged dams;
- Assist local jurisdictions on understanding dam emergency action plans and actions;
- If needed assist federal partners on inspection of federal dams.
- Provide inspection of levees that fall outside of US Army Corps of Engineers jurisdiction;
- Provide technical expertise on civil engineering, hydrology and geotechnical issues to State agencies and local municipalities.

Assets

- The primary facility for the Water Resource Department is in Salem, with regional managers located throughout the State. (Figure WRD 1). The Salem office serves as the headquarters for WRD operations. Regional offices could be used for WRD response;
- Within these regions there are 21 Water Masters Offices:



OWRD regions: W SW SC NC E
Water Resource Department Regions

<p>District 1 c/o Port of Tillamook Bay 4000 Blimp Blvd Tillamook, Oregon 97141 Ph: 503-842-2413 ext 119 Fax: 503-842-3680</p>	<p>District 2 Central Lane Justice Court 220 5th St Springfield, OR 97477 Ph: 541-682-3620 Fax: 541-746-1861</p>	<p>District 3 2705 E 2nd St The Dalles, Oregon 97058 Ph: 541-506-2650 Fax: 541-506-2651</p>	<p>District 4 201 S Humbolt, Suite 180 Grant County Courthouse Canyon City, Oregon 97820 Ph: 541-575-0119 Fax: 541-575-0641</p>
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<p>District 5 116 SE Dorion Ave Pendleton, Oregon 97801 Ph: 541-278-5456 Fax: 541-278-0287</p>	<p>District 6 10507 N McAlister Rd #6 La Grande, Oregon 97850 Ph: 541-963-1031 Fax: 866-214-3493</p>	<p>District 8 Baker County Courthouse 1995 3rd Street, Suite 180 Baker City, Oregon 97814 Ph: 541-523-8224 ext 31 Fax: 866-214-3493</p>	<p>District 9 Malheur County Courthouse #4, 251 B St W Vale, Oregon 97918 Ph: 541-473-5130 Fax: 541-473-5522</p>
<p>District 10 Harney County Courthouse 450 N Buena Vista #3 Burns, OR 97720 Ph: 541-573-2591 Fax: 541-573-8387</p>	<p>District 11 1128 NW Harriman St Bend, Oregon 97701 Ph: 541-388-6669 Fax: 541-388-5101</p>	<p>District 12 513 Center St Lakeview, Oregon 97630 Ph: 541-947-6038 Fax: 541-947-6063</p>	<p>District 13 10 S Oakdale, Rm 309A Medford, Oregon 97501 Ph: 541-774-6880 Fax: 541-774-6187</p>
<p>District 14 700 NW Dimmick St. Grants Pass, Oregon 97526 Ph: 541-479-2401 Fax: 541-479-2404</p>	<p>District 15 Douglas County Courthouse, Room 306 Roseburg, Oregon 97470 Ph: 541-440-4255 Fax: 541-440-6264</p>	<p>District 16 725 Summer St NE, Suite A Salem, Oregon 97301 Phone: 503-986-0889 Fax: 503-986-0903</p>	<p>District 17 5170 Summers Ln Klamath Falls, Oregon 97603 Ph: 541-883-4182 Fax: 541-885-3324</p>
<p>District 18 1400 SW Walnut St, Suite 240 Hillsboro, Oregon 97123 Ph: 503-846-7780 Fax: 503-846-7785</p>	<p>District 19 Physical Address: 225 N Adams Coquille, Oregon 97423 Ph: 541-396-1905 Fax: 541-396-1906</p>	<p>District 20 1678 S Beaver Creek Rd, Suite L Oregon City, Oregon 97045 Ph: 503-722-1410 Fax: 503-722-5926</p>	<p>District 21 221 S Oregon St. P.O. Box 427 Condon, OR 97823 Ph: 541-384-4207 Fax: 541-384-2167</p>

- Regional and Water Masters offices have moderate autonomy and are not completely dependent on the main facility in Salem;
- WRD currently has two engineers with civil and geotechnical engineering expertise. There are also five hydrologists with WRD. These personnel are located in Salem;
- WRD has a fleet of 20-30 4x4 vehicles throughout the State at the primary, regional and Water Master Offices;
- WRD has limited communications abilities (telephone and internet), and no radio capacity. WRD does have some Spot locators;
- Dam inspections and field activities can be done without computer access;
- WRD has dam specifications for Statewide dams;
- WRD estimates that approximately 70% of its personnel (100% of response personnel) would be available following the earthquake with coastal facilities being hit the hardest.

Capabilities

- Can provide dam safety engineering assessment of dams;
- Can provide geotechnical engineering expertise;
- WRD can provide limited structural engineering assessment work on structures and bridges;
- Through the Joint Information Center, can provide the public with alert and notification information regarding dam safety issues;
- Can provide dam and levee damage assessment training (1/2 day of instruction, can train approx. 30 people);

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- Investigate failures of dams and what mechanisms contributed to the failure;
- Can coordinate with Association of State Dam Safety officials for assistance;
- WRD Well Construction program would be involved in long term recovery;
- Long Term recovery assistance with water rights issues following disruption of existing systems;
- Most communities in Western Oregon use groundwater as a component of their drinking water system; WRD would require construction standards for groundwater development for protection of aquifers. WRD will provide technical assistance in the restoration of groundwater systems in an orderly way that ensures continued use of groundwater investments;
- Liaise with Corps of Engineers, FERC, Bureau of Reclamation and FEMA on dam safety and water resource issues. Provide a liaison to State ECC.

Support Needed Immediately After a Catastrophic Event:

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- Accessibility to fuel resources;
- One of WRD engineers serves as the ECC liaison, leaving the agency short staffed;
- Depending on number of dams needing damage assessment more trained engineering staff may be needed;
- WRD will need communication assistance (both communication assistance and potentially radio equipment for use in dam inspections);
- Aerial transportation for airborne assessments of dams (helicopters would be needed for a detailed aerial assessment).

3.3 Adjunct Agencies

3.3.1 Oregon Water / Wastewater Agency Response Network (ORWARN)

ORWARN is a water and wastewater utility Statewide mutual aid and assistance network.

Oregon Water/Wastewater Agency Response Network is part of a national effort by water and wastewater utilities to establish voluntary intrastate mutual aid and assistance networks. The objective is to provide rapid, short term deployment of emergency services to restore critical operations to utilities that have sustained damages from natural or man-made events.

Priorities

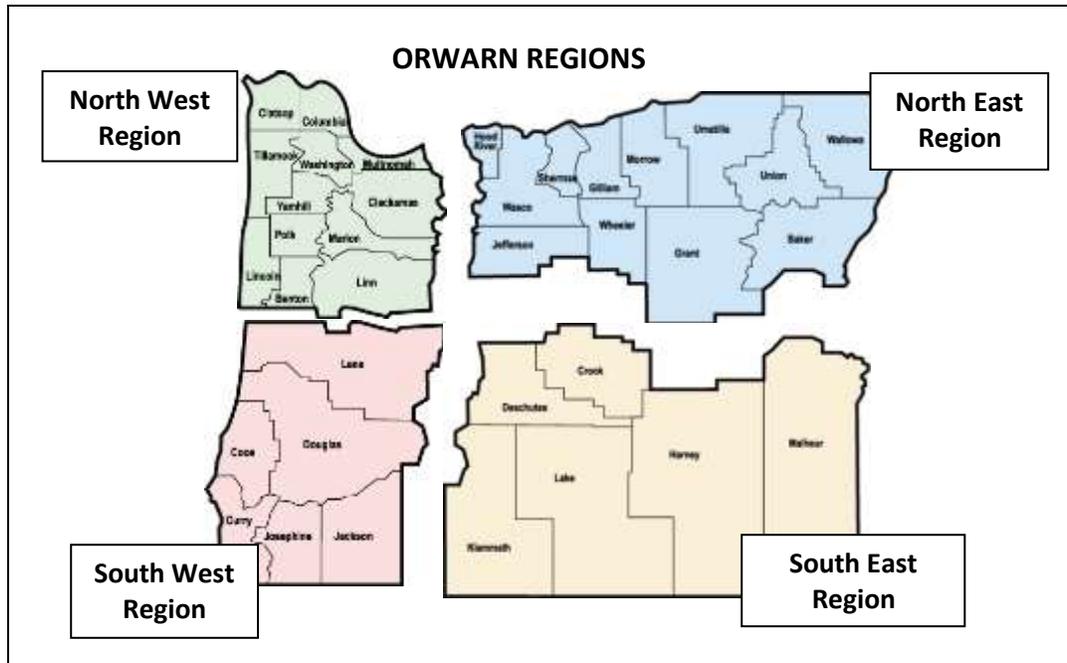
- Life and safety of responders and the public;
- Reestablishing potable water networks in affected areas;
- Reestablishing waste water networks in affected areas.

Assets

- Statewide mutual aid agreement supports:
 - Voluntary mutual aid between member utilities.

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- Expedited arrival of assistance through pre-established agreements.
- Reduced administrative conflict.
- Emphasis on restoration of utility services.



- Over 100 participating public and private water utility districts are members and signatories in the State:

ORWARN Members (Accurate as of Feb 2012)		City	County
1	Boring Water District No. 24	Boring	Clackamas
2	City of Albany	Albany	Linn
3	City of Ashland	Ashland	Jackson
4	City of Baker City	Baker City	Baker
5	City of Bandon	Bandon	Coos
6	City of Banks	Banks	Washington
7	City of Bay City	Bay City	Tillamook
8	City of Beaverton	Beaverton	Washington
9	City of Bend	Bend	Deschutes
10	City of Central Point	Central Point	Jackson
11	City of Coburg	Coburg	Lane

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12	City of Corvallis	Corvallis	Benton
13	City of Cottage Grove	Cottage Grove	Lane
14	City of Dayton	Dayton	Yamhill
15	City of Detroit	Detroit	Marion
16	City of Dundee	Dundee	Yamhill
17	City of Estacada	Estacada	Clackamas
18	City of Eugene Wastewater	Eugene	Lane
19	City of Fairview	Fairview	Multnomah
20	City of Florence	Florence	Lane
21	City of Garibaldi	Garibaldi	Tillamook
22	City of Gates	Gates	Marion
23	City of Gladstone	Gladstone	Clackamas
24	City of Glendale	Glendale	Douglas
25	City of Gold Beach	Gold Beach	Curry
26	City of Grants Pass	Grants Pass	Josephine
27	City of Gresham	Gresham	Multnomah
28	City of Hillsboro	Hillsboro	Washington
29	City of Idanha	Idanha	Marion
30	City of Independence	Independence	Polk
31	City of Keizer	Keizer	Marion
32	City of Klamath Falls	Klamath Falls	Klamath
33	City of Lake Oswego	Lake Oswego	Clackamas
34	City of Manzanita	Manzanita	Tillamook
35	City of Mill City	Mill City	Marion
36	City of Molalla	Molalla	Clackamas
37	City of Monmouth	Monmouth	Polk
38	City of Newberg	Newberg	Yamhill
39	City of North Plains	North Plains	Washington

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40	City of Oregon City	Oregon City	Clackamas
41	City of Pendleton	Pendleton	Umatilla
42	City of Philomath	Philomath	Benton
43	City of Port Orford	Port Orford	Curry
44	City of Portland Environmental Services	Portland	Multnomah
45	City of Portland Water Bureau	Portland	Multnomah
46	City of Redmond	Redmond	Deschutes
47	City of Salem	Salem	Marion
48	City of Sandy	Sandy	Clackamas
49	City of Sherwood	Sherwood	Washington
50	City of Silverton	Silverton	Marion
51	City of Springfield	Springfield	Lane
52	City of Sweet Home	Sweet Home	Linn
53	City of The Dalles	The Dalles	Wasco
54	City of Tigard	Tigard	Washington
55	City of Toledo	Toledo	Lincoln
56	City of Troutdale	Troutdale	Multnomah
57	City of Tualatin	Tualatin	Washington
58	City of Turner	Turner	Marion
59	City of Veneta	Veneta	Lane
60	City of Waldport	Waldport	Lincoln
61	City of West Linn	West Linn	Clackamas
62	City of Wilsonville	Wilsonville	Clackamas
63	City of Wood Village	Wood Village	Washington
64	City of Yachats	Yachats	Lincoln
65	Clackamas County Water Environment Services	Clackamas	Clackamas
66	Clackamas River Water	Clackamas	Clackamas
67	Clean Water Services	Hillsboro	Washington

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68	Corbett Water District	Corbett	Multnomah
69	Crescent Water Association	Crescent	Klamath
70	Eugene Water & Electric Board	Eugene	Lane
71	Joint Water Commission	Hillsboro	Washington
72	LA Water Co-Op	Gaston	Washington
73	Langlois Water District	Langlois	Curry
74	Lusted Water District	Troutdale	Multnomah
75	Metropolitan Wastewater Management Commission	Springfield	Lane
76	Mulino Water District No. 1	Mulino	Clackamas
77	Multnomah County Drainage District No. 1	Portland	Multnomah
78	North Clackams County Water Commission	Oregon City	Clackamas
79	Oak Lodge Sanitary District	Milwaukie	Clackamas
80	Oak Lodge Water District	Milwaukie	Clackamas
81	Rainbow Water District	Springfield	Lane
82	Raleigh Water District	Portland	Washington
83	Rivergrove Water District	Lake Oswego	Clackamas
84	Rockwood Water People's Utility District	Portland	Multnomah
85	Rogue Valley Sewer Services	Central Point	Jackson
86	Seal Rock Water District	Seal Rock	Lincoln
87	South Fork Water Board	Oregon City	Clackamas
88	Southwood Park Water District	Beaverton	Washington
89	Springfield Utility Board	Springfield	Lane
90	Suburban East Salem Water District	Salem	Marion
91	Sunrise Water Authority	Happy Valley	Clackamas
92	Tillamook County Creamery Association	Tillamook	Tillamook
93	Tillamook County Public Works	Tillamook	Tillamook
94	Tualatin Valley Water District	Beaverton	Washington
95	Valley View Water District	Portland	Washington

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96	Warren Water Association	Warren	Columbia
97	Watseco-Barview Water District	Rockaway Beach	Tillamook
98	West Slope Water District	Portland	Multnomah
99	Westport Sewer Service District of Clatsop County	Astoria	Clatsop
100	Wolsborn Farms Water District	Hillsboro	Washington

Typical Assets Available Through Member Agencies

- Multiyear supply contracts with John Deere, CAT, United Rental, companies for equipment. The companies will deliver equipment when and where needed;
- Contracts for laboratory services for water testing;
- Fleet contracts for repair/replacement;
- Fuel - Some utilities have internal fuel supplies of varying quantities. Others use commercial fuel;
- Contracts with Hillsboro Aviation for aerial observation / assessment of dams and reservoirs;
- Emergency response command trailer with satellite capabilities;
- Portland area has ham radio capabilities. Have exercised with ARES and have access to their services;
- Nextel communications capabilities. Have redundant communications capabilities and can function on Statewide frequencies;
- Water distribution/delivery systems;
- Have open ended contracts with architect and engineering firms.

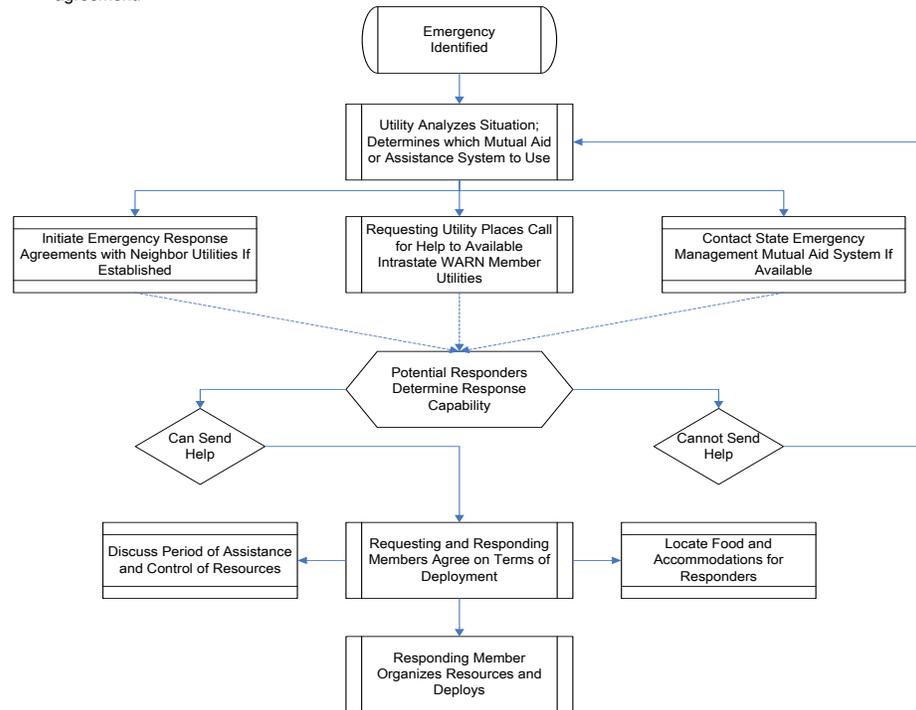
Capabilities

- Help other communities who need emergency assistance in reestablishing water and waste water services;
- Work to provide bacteriologically safe water in impacted areas;
- Coordinate and interface with the following agencies:
 - American Water Works Association
 - Oregon Association of Water Utilities
 - Water Environment Federation
 - FEMA
 - Oregon Department of Environmental Quality
 - U.S. Environmental Protection Agency

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ORWARN Mutual Aid can be activated as follows:

A utility may have as many as three options for obtaining assistance via local one to one agreements, access through a statewide mutual aid program for public agency responders, and the intrastate WARN utilities agreement.



- All team activations for equipment and teams conform to FEMA’s resource typing for public works.

ORWARN Member Utilities can:

- Coordinate and compile damage reports from utilities;
- Coordinate damage assessment activities with other agencies, e.g., county emergency management agencies, utility engineers, etc.;
- Log, track, and display damage assessment information;
- Provide damage assessment information to the ORWARN Leader or designated resource coordination Response Team Member to facilitate incident prioritization;
- Assemble and maintain information concerning critical facilities and special needs facilities associated with each utility included in the ORWARN Operational Plan;
- Transmit Damage Assessment Reports to the other appropriate agencies, as requested;
- Support mutual aid crews in the field interacting with the public to gather more information as the emergency unfolds, and methods to gather damage information;
- Coordinate damage data with the State and FEMA responders to assist in the recovery process;
- Act as a liaison to the Utilities Branch of the county, and/or State level emergency operation centers;
- Identify possible sources of additional support for ORWARN Member Utilities;
- Identify gaps in the requests and resources available;

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Catastrophic Event Operational Challenges

- By nature of a catastrophic event, essential personnel will be delayed in response due to commitments to personal and family safety and security. Responses will be delayed as personnel check in as 'available' for mission deployment;
- Accessibility to fuel resources;
- Roadway access to damaged facilities;
- Communication coverage issues.

Support Needed Immediately After A Catastrophic Event

- Fuel;
- Trained personnel;
- Equipment and pipe line replacement materials;
- EMAC DPW response teams and equipment;
- Responding teams will need base camps with food, sleeping arrangements, and sanitary facilities;
- 'Cold start' package to get water treatment plants operational;
- Generators;
- Tires – all sizes to include large truck tires.

4 ESF-3 Operations

OEM will coordinate all requests for assistance and communicate with the State agencies to identify the appropriate action and State resources to be used. Once Public Works and Engineering resources have been identified to meet the request, OEM will create an action to the specific State agencies to accomplish the task.

ODOT will provide a representative to the ECC who will be the primary point of contact for all ESF-3 needs. ODOT maintains an Agency Operations Center (AOC) off site to specifically manage and coordinate their resources.

4.1 Objective

Objective is initially to provide an accurate assessment of damages to determine the need for State and/or federal assistance, and to conduct safety evaluations to protect public health and welfare.

To establish policies, procedures, and priorities for water resources, sewer facilities, waste disposal and to provide for coordinating immediate and continued engineering resources, repair and construction management, emergency contracting, and expertise following a Cascadia Subduction Zone Earthquake and resulting tsunami.

4.2 Challenges

- Infrastructure interdependencies create a demand for a synchronized approach to repair and restoring capacity;
- Limited availability of repair parts for major system components are in short supply and have long lead times to replace;

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- Lack of functional communication will limit the ability to assess damage to key infrastructure.

4.3 Assumptions:

- Damage from the initial earthquake and tsunami will destroy most of HWY 101 and other roads that provide access to the coast;
- Number of significantly damaged water, wastewater, communications, gas and power infrastructure locations will overwhelm the limited number of engineers, inspectors and crews to conduct assessments and inspections;
- Instant loss of land line/network communications/power will limit ability Statewide of providing local situational awareness;
- Significant damage and debris will limit access to conduct assessments and repair;
- Access and supporting infrastructure to/from airports will be a limiting factor for aerial delivery of resources;
- Aftershocks will cause a significant amount of additional damage during the response;
- Tsunami threat from aftershocks and floating debris will limit access to coastal communities;
- The initial earthquake and continuing aftershocks will cause an immediate region-wide power outage;
- Loss of power will last for months throughout the impacted area;
- Damage to natural gas and petroleum pipelines will contribute to fuel shortages in entire region;
- Dams and Levees will sustain damage during the initial earthquake and will require immediate assessment;
- Potable water will be needed for vast portions of Western Oregon;
- Wastewater treatment will be severely impacted in Western Oregon, adding to already unhealthy conditions;
- Fuel requirements for assessment and repair crews will exceed local capability;
- Local, State and Federal capabilities and resources will be overwhelmed by the magnitude of the incident;
- Response resources in the impacted area will have limited capability to function and some impacted areas will be isolated;
- Resources outside of the impacted area will have extended response times due to significant impact to transportation infrastructure;
- Severe winter weather including rain, snow, fog may hamper response operations.

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4.4 ESF 3 Shortfalls and Requirements:

SHORTFALLS	REQUIREMENTS
Damage assessment capability. (Power, Gas, Water, Wastewater, Petroleum)	<ul style="list-style-type: none"> ▪ Aerial Platforms to conduct visual inspections to key infrastructure sites. ▪ Tactical Communications support to coordinate infrastructure assessments/repair. ▪ Geospatial prioritization for assessments
Limited access to the impacted area	<ul style="list-style-type: none"> ▪ Rotary wing support to transport repair teams. ▪ Security for Repair and assessment teams. ▪ Debris clearance to provide access to impacted areas. ▪ Waivers for driver restrictions and oversize vehicles on public roads.
Availability of local crews to provide repair and restoration crews.	<ul style="list-style-type: none"> ▪ Coordinate priorities and requirements between public and private sector partners. ▪ Life support and facilities for out of State repair crews

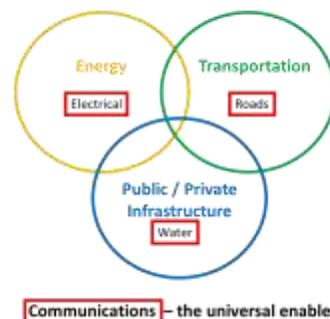
4.5 Concept of Operations

Hazard analysis indicates an earthquake and subsequent tsunami will severely disrupt public works facilities into and within the Statewide impacted areas and the surrounding areas. Damage assessment by qualified personnel and transportation into and within impacted areas will be challenging. Transporting heavy equipment and other resources will require unique solutions. Significant resources and qualified personnel from areas outside impacted areas will be needed.

ESF-3 functions include but are not limited to:

- Due to the limited number of licensed building inspectors and State-employed engineers, there will be an immediate request for additional engineering support from federal government and/or EMAC request;
- ESF-3 will support county and local building officials in inspecting and evaluating critical facilities with State-licensed building inspectors and/or engineers;
- Coordinate debris removal in conjunction with Oregon Debris Removal Plan;
- Coordinate with water and sewage treatment facilities in all matters concerning water supply quality and sewage treatment;
- Plan and prepare for the impact on the water and develop strategies to provide water in the Operational Areas;
- Plan and prepare for the impact on the water and develop strategies to provide water in the Operational Areas;
- Coordination with ESF -1 ESF-2, ESF-12 on prioritizing areas where

Critical Infrastructure Prioritization



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transportation, public works, communications and power infrastructure can be repaired in tandem.

- Identify private sector contractors for engineering assistance, provision of potable water, sanitation supplies, portable sanitation equipment or equipment to use in repair of facilities in support of the earthquake response efforts;
- Identify points of contact (POC), methods of operations, and access procedures that will allow for rapid response to those requirements;
- Coordinate with U.S. Army Corps of Engineers and other Federal partners as requested to provide engineering support;
- Prepare and coordinate with ESF-1 and ESF-7 to provide transportation requirements for public works supplies and equipment;
- Identify agencies and organizations that could provide additional resources in support of the earthquake response efforts;
- Establish engineering priorities, and coordinate those priorities with State ECC;
- The emergency operations necessary for the performance of this function include but are not limited to:
 - ESF-3 responding agencies activate ESF-3 Public Works and Engineering Plans through their AOCs.
 - State ECC receives and coordinates county and State agency infrastructure requirements (personnel, equipment) to begin restoration of necessary utilities.
 - Coordinate with and request ESF-13 source and provide personnel to accompany ESF-3 responders to maintain security.
 - Coordinate with appropriate agencies to determine the damage status and the operability of water and wastewater facilities.
 - Validate resource shortfalls and obtain necessary resources.
 - Coordination with Federal partners.

5 Supporting Documents

- National Response Framework, ESF 3 – Public Works and Engineering
- County ESF 3 Annexes
- Oregon Department of Transportation Emergency Operations Plan
- Various Dam Emergency Action Plans
- ORWARN Mutual Aid/Assistance Operational Plan

6 Appendices

None at this time.

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