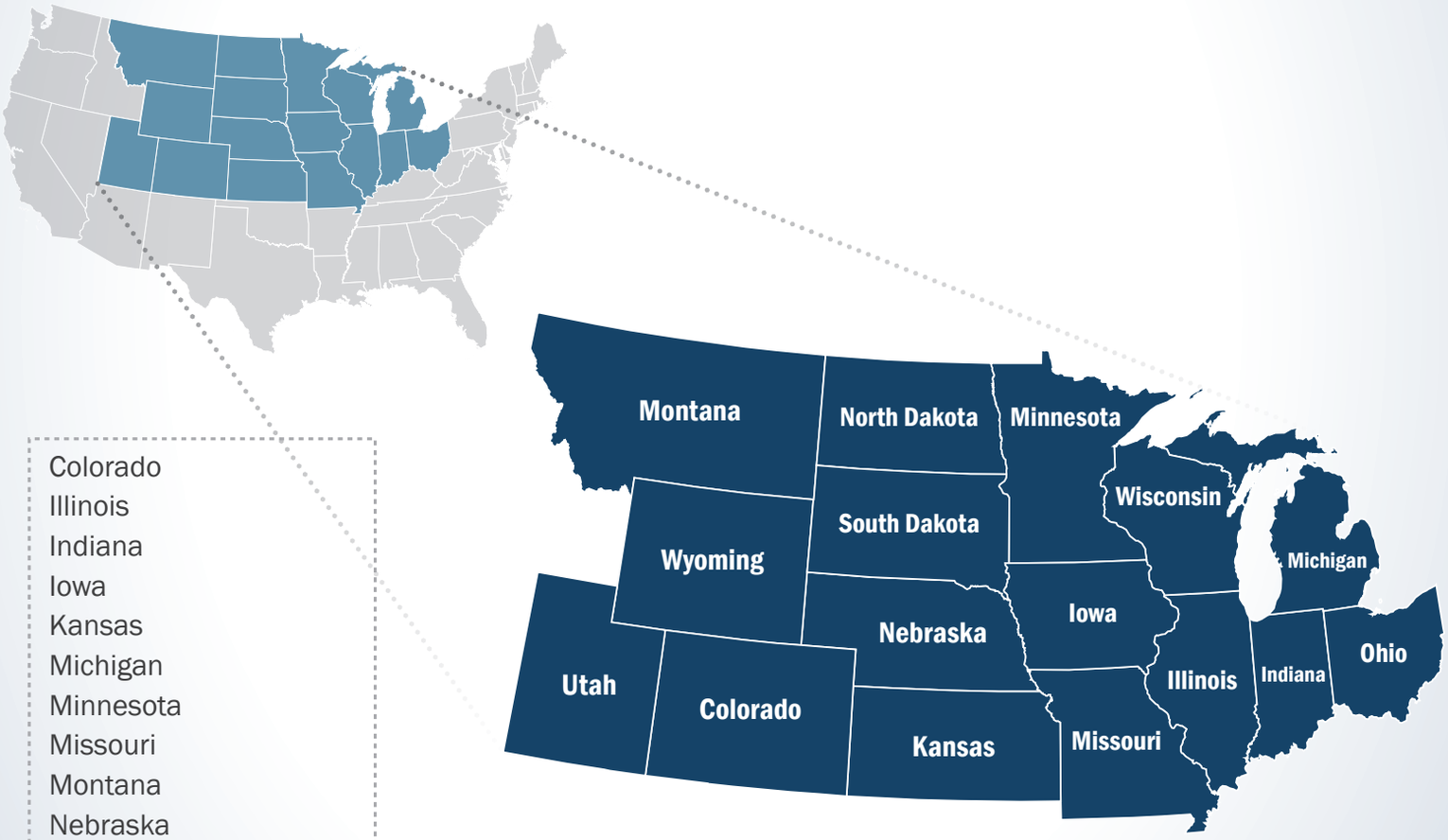
FirstNet®

Nationwide Public Safety Broadband Network

Draft Programmatic Environmental Impact Statement for the Central United States

VOLUME 17 - CHAPTERS 19-25 & APPENDICES



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First Responder Network Authority

FirstNet®

Nationwide Public Safety Broadband Network

Draft Programmatic Environmental Impact Statement for the Central United States

VOLUME 17 - CHAPTERS 19-25 & APPENDICES

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Cooperating Agencies
Federal Communications Commission
General Services Administration
U.S. Department of Agriculture—Rural Utilities Service
U.S. Department of Agriculture—U.S. Forest Service
U.S. Department of Agriculture—Natural Resource Conservation Service
U.S. Department of Defense—Department of the Air Force
U.S. Department of Energy
U.S. Department of Homeland Security

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19. BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Each of the state chapters includes descriptions of the affected environment and potential environmental impacts (beneficial or adverse) resulting from the Proposed Action and Alternatives. For those impacts identified as potentially significant, best management practices (BMPs) and mitigation measures may reduce the significance to less than significant. To minimize the potential impacts of the deployment and operation of the nationwide public safety broadband network (NPSBN), FirstNet and/or its partners will require, as practicable or feasible, BMPs and mitigation measures that could avoid or minimize potential impacts. This chapter identifies BMPs and mitigation measures by resource area, with state-specific recommendations where appropriate.

19.1. INFRASTRUCTURE

19.1.1. BMPs and Mitigation Measures for All Project Types

This section describes BMPs and mitigation measures to address potential impacts to infrastructure resources. Based on the analyses of proposed activities in Chapters 3 through 16, the potential activities associated with the deployment and operation of the Proposed Action and alternatives are expected to have less than significant impacts. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures to further reduce potential impacts:

- Follow all applicable federal, state, and local requirements for construction on or near public roads;
- Follow all applicable federal, state, and local laws concerning traffic speed and safety during the transport of equipment;
- Avoid roads with heavy traffic volumes and during peak travel hours, to the extent possible, when scheduling the transport of heavy equipment or construction materials;
- Schedule deployment activities outside of peak traffic hours;
- Design staging areas to minimize unnecessary equipment and material mobilizations;
- Repave and restore disturbed roads and public road rights-of-way (ROWs), in accordance with federal, state, and local laws, as quickly as possible so as to not create any traffic impediments that hinder access to local public safety and emergency facilities and to allow traffic capacity and safety conditions to return to their pre-construction condition;
- Design new deployment activities within ROWs, to the extent possible, and outside of roadways and thoroughfares to minimize potential impacts on traffic flow or safety;
- Coordinate closely with public safety officials, emergency and medical facilities, and existing telecommunications providers so that each is aware of the deployment activities and schedule;

- Schedule new construction outside of seasons known to cause more accidents (e.g., hurricane or winter storm seasons or times of the year when wildfires are more likely to occur) to minimize the potential for impact associated with unforeseen service disruptions during deployment activities;
- Confirm or otherwise install detection systems so that if and when a disruption to utility services or telecommunications systems occurs, it is identified and can be repaired quickly;
- Implement a backup telecommunications system, as needed, which allows first responders to communicate during deployment activities until the new NPSBN has been successfully implemented;
- Complete deployment activities as quickly and safely as possible to avoid any possible disruptions to utility services;
- Complete deployment activities that could interrupt power during times when people are less likely to use power or water;
- Follow all applicable federal, state, or local requirements regarding utilities (water, sewer, power, and electricity) and construction within a utility ROW as to not exceed any acceptable limits; and
- Follow all applicable state and local one-call[1] laws and procedures for buildouts.

19.1.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

19.2. SOILS

19.2.1. BMPs and Mitigation Measures for All Project Types

Implementation of the Proposed Action and alternatives could include potential construction-related impacts to soil resources resulting from ground disturbance activities. Based on the analyses in Chapters 3 through 16, potential impacts from the proposed activities would be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Follow all applicable federal, state and local requirements for soil erosion and sedimentation control and permitting to avoid or minimize erosion and sedimentation and restore disturbed soil;
- Minimize soil disturbance to the extent practicable;[2]

[1] "One call" refers to the use of a single phone call to notify the utilities in the area of impending excavation activities. Often the utilities will go to the site and mark their lines (either with flags or paint) so that the excavation can avoid, if possible, damaging the utility equipment or disrupting service.

[2] See Section 19.5, Wetlands, for a discussion of BMPs and mitigation measures in wetlands.

- Avoid construction in areas with steep (greater than 20 percent) or unstable slopes with soils known to be particularly susceptible to soil erosion and construct facilities in alternate locations if practical;
- Develop a soil erosion and sedimentation control plan for disturbed areas, and implement BMPs and mitigation measures including the use of silt fences, fiber rolls, gravel bag berms, erosion control blankets,[3] retention ponds, straw and sandbag barriers, and other controls as needed to reduce soil erosion, stormwater runoff, and sedimentation;
- Schedule construction activities to avoid, to the extent possible, movement of heavy equipment across land surfaces immediately following heavy rainfall;
- Minimize the area of bare soil at any one time as much as possible by constructing in stages;
- Revegetate disturbed areas as progressively and quickly as practicable to achieve stabilization;[4]
- For areas requiring plowing, remove and store topsoil with a woven weed barrier or similar material for post-construction site restoration;
- To the extent possible, avoid construction activities immediately following heavy precipitation events, or cover exposed areas with tarps or similar materials to prevent exposure;
- Avoid areas identified as having soils that are vulnerable to compaction; select alternate locations to construct facilities if practical. All vehicles should stay on existing roads or previously disturbed areas to the maximum extent practicable;
- Use deep tillage procedures where practical to loosen compacted soils;
- Restore soil surface to original or improved contours;
- Segregate topsoil to avoid topsoil compaction;
- Use timber mats or similar infrastructure, as deemed necessary, to distribute vehicle and heavy equipment weight;
- Minimize soil disturbance to the extent practicable, especially in wetland and designated natural resource areas;
- Segregate topsoil or surface soil from subsurface layers during construction;[5]
- Implement temporary topsoil storage areas;

[3] Silt fences are designed to trap sediment in the area where construction or soil disturbance is taking place to minimize or avoid soil erosion and sedimentation. They are often 2- to 3-feet tall and are buried 8 to 12 inches into the soil with stakes. Erosion control blankets are biodegradable or synthetic sheet-like materials that are rolled out onto disturbed areas to protect soil from wind and water erosion.

[4] Plant roots play a significant role in stabilizing soils. Seeding disturbed areas quickly after construction activities would allow for faster plant and root development and would therefore provide better erosion protection.

[5] Topsoil is segregated from subsoil layers by stripping the uppermost soil from the area being excavated and storing it separately from the subsurface soil. Once construction is completed, the topsoil is replaced as the uppermost soil unit.

- Identify and maintain topsoil;
- Replace topsoil as soon as possible following construction;
- Avoid construction activities resulting in soil disturbance during periods or months with heavy rainfall and snowmelt,[6] to the extent possible; and
- Pay particular attention to areas identified as having soils that are vulnerable to compaction (see Affected Environment Soils sections) and select alternate locations to construct facilities if practical.

19.2.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures for soils beyond those listed above for all project types.

19.3. GEOLOGY

19.3.1. BMPs and Mitigation Measures for All Project Types

Environmental concerns regarding geology can be viewed as two distinct types, those that would potentially result in impacts to the project, such as seismic hazards, landslides, and volcanic activity, and those that would potentially be impacts from the project, such as land subsidence, mineral and fossil fuel resources, paleontological resources, and impacts to resources such as surface geology, bedrock, topography, physiography, and geomorphology. Based on the analyses in Chapters 3 through 16, impacts associated with deployment or operational activities are anticipated to have less than significant impacts to geology. For those areas with the potential to encounter geologic hazards, FirstNet and/or its partners would require, as practicable or feasible, the BMPs and mitigation measures listed below, to further reduce potential impacts:

- Follow all applicable federal, state, and local requirements for construction codes, seismic criteria, and geotechnical designs;
- Locate construction/deployment activities outside of high risk seismic hazard zones, active faults, and away from low coastal areas;
- Avoid construction in seismically active areas, locations with karst topography or that have shown recent subsidence, or steep or unstable slopes that are susceptible to erosion; construct facilities in alternate locations if practical;
- Avoid, to the extent practicable, deployment in areas that undergo significant geomorphological changes, such as within streams and rivers;
- Design and deploy resilient infrastructure to withstand earthquakes typical to the region;
- Construct all infrastructure to standards that meet or exceed state seismic requirements;

[6] See Affected Environment Climate Change sections for an explanation of seasonal climate and weather patterns.

- Locate construction/deployment activities away from steep slopes with unconsolidated material and other areas prone to landslides, to the extent practicable; and
- Locate construction/deployment activities outside of areas identified as having karst topography, loosely compacted soils, and low density sediments prone to subsidence or compaction, to the extent practicable.

For those areas with the potential to encounter mineral or fossil fuel resources, or paleontological resources, or impact surface geology, bedrock, topography, physiography, and geomorphology, FirstNet and/or its partners would require, as practicable or feasible, the BMPs and mitigation measures listed below, to further reduce potential impacts:

- Follow all applicable federal, state, and local requirements for mineral, fossil fuel, and paleontological resources;
- Avoid rock ripping to the extent practicable to preserve bedrock resources, topography, and physiography;
- Minimize the area/volume of disturbed/removed terrain during deployment/construction;
- Avoid areas with significant fossil resources, if practicable;
- Monitor deployment/construction activities and salvage fossils if areas with significant fossil resources cannot be avoided, to the extent practicable and in accordance with applicable laws and regulations;
- If paleontological resources are encountered on a project construction site, suspend all work until a certified paleontologist has been brought on-site to oversee project activities and ensure that fossil resources are handled properly;
- Limit construction to areas that are not actively mined or undergoing mineral or other material or petroleum extraction activities, or coordinate deployment with mining and extraction activities (both existing and planned) in active areas;
- Restore topographic features and grades to pre-construction/deployment conditions; and
- Develop a Paleontological Monitoring and Mitigation Plan outlining areas with high likelihood for encountering significant fossil resources and plans for avoidance and appropriate response if previously unknown resources are encountered.

19.3.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures for geology beyond those listed above for all project types.

19.4. WATER RESOURCES

19.4.1. BMPs and Mitigation Measures for All Project Types

Implementation of the Proposed Action and alternatives could include potential deployment-related and operation-related impacts to water resources resulting from ground disturbance

activities, such as an increase in erosion or sedimentation near construction and staging areas. Based on the analyses in Chapters 3 through 16, potential impacts to water resources from the proposed activities are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Minimize ground disturbance in or near waterbodies during construction, as practicable, particularly in areas prone to erosion;
- Follow all applicable federal, state, and local requirements for soil erosion and sedimentation control and permitting to avoid or minimize introduction of eroded materials into waterbodies;
- Development of a stormwater pollution prevention plan (SWPPP);
- Include engineered or site designed methods to control stormwater;
- For large-scale construction activities, implement stormwater reduction methods, including minimizing impervious surfaces, using porous materials, or collecting and reusing stormwater (e.g., extended detention ponds, stormwater wetlands, filtration structures,[7] and infiltration [or recharge] basins[8]);
- For large-scale construction activities, direct water to stormwater drains, or to constructed bioretention,[9] rain garden, or other storage and retention areas designed to slow water and allow sediments to settle out;
- Minimize the total area of bare soil at any one time as much as possible by constructing in stages;
- Minimize clearing of riparian and streamside vegetation, as practicable;
- Establish and clearly mark all waterbody buffers in the field with signs or highly visible flagging until construction-related ground disturbing activities are complete;
- Stabilize and revegetate disturbed areas as progressively and quickly as practicable;
- Place materials storage and staging areas outside of waterways and floodplains, as practicable;
- Avoid construction of roads and other impervious surfaces in floodplain areas to the extent practicable, and where necessary in floodplains, construct roads and other impervious surfaces level with existing grades, as practicable, to not change or restrict water flow;

[7] Stormwater filtration structures use a filtering media (sand, soil, gravel, peat, or compost) to remove pollutants from stormwater runoff.

[8] Infiltration basins (also known as recharge basins) are considered a treatment BMP because they can remove pollutants from surface discharges by capturing the stormwater runoff volume (typically, larger volumes than an infiltration trench) and infiltrating it directly to the soil rather than discharging it to an aboveground drainage system.

[9] Bioretention is a structural stormwater control measure that captures and temporarily stores stormwater runoff using soils and vegetation in shallow basins or landscaped areas to provide enhanced removal of dissolved stormwater pollutants, including nutrients, pesticides, organics, metals, and biological constituents.

- Station all deployables and aboveground structures outside of the 100-year floodplain, to the extent practicable. If deployables or aboveground structures must be placed in 100-year floodplains, station them such that they are not vulnerable to be damaged by flood flows and do not themselves impede or restrict flood flows, as practicable;
- Restore native vegetation/wetlands to stabilize streambanks and stop erosion;
- Ensure any development proposed in a floodway or floodplain meets or exceeds state or local regulations;
- Avoid construction, where feasible, in areas with steep or unstable slopes with soils known to be particularly susceptible to soil erosion and construct facilities in alternate locations if practical;
- Develop a soil erosion and sedimentation control plan for disturbed areas, and implement BMPs, as appropriate, including the use of silt fences, erosion control blankets, and other controls as needed to reduce soil erosion, stormwater runoff, and sedimentation;
- Avoid construction activities (especially activities resulting in soil disturbance), to the extent possible, during rainy or snowmelt seasons when streamflow, rainfall, and runoff are highest;
- Monitor site restoration following ground disturbance activities, as required by law or permit; implement contingency measures if site restoration should fail and soil erosion occurs;
- Retain vegetative buffers, wherever possible, to prevent runoff into waterbodies;
- Minimize in-stream work to the extent practicable;
- Construct all stream crossings (roads and trenching) as close as perpendicular to the axis of the waterbody channel as engineering and routing conditions permit;
- Use standard upland construction techniques when crossing of waterbodies when they are dry or frozen and not flowing or as required by permit or law, provided that it is not likely for flow to resume during construction and prior to post-construction stabilization;
- Route the stream crossing to minimize the number of waterbody crossings where waterbodies meander or have multiple channels, as practicable;
- Inspect and maintain tanks and equipment containing oil, fuel, or chemicals for drips or leaks to prevent spills to the ground or directly into waterbodies;
- Maintain and repair all equipment and vehicles on impervious surfaces, as practicable, away from all sources of surface water;
- Park vehicles at least 50 feet from any stream or wetland unless authorized by a permit or on an existing roadway, as practicable;
- Deposit and stabilize all excavated material not reused in an upland area outside of floodplains and streams;
- Design any structures located in floodplains, as feasible, with structural hardening to withstand flooding and to not increase the risk of flooding for other areas of the floodplain;
- Properly space and size culverts in accordance with federal, state or local regulations;
- Stabilize approaches to streams and stream crossings with clean rock or steel plates during construction to minimize erosion and sedimentation, as practicable;
- Do not permit underwater blasting and pile driving activities in any water body;
- Place materials storage and staging areas outside of waterways and floodplains;

- Deposit and stabilize all excavated material not reused in an upland area outside of floodplains and streams; and
- If in-stream construction (trenching or roads) must be conducted during times that streams have flow, maintain adequate waterbody flow rates to protect aquatic life, and prevent the interruption of existing downstream users, as practicable.

19.4.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures for geology beyond those listed above for all project types.

19.5. WETLANDS

19.5.1. BMPs and Mitigation Measures for All Project Types

Implementation of the Proposed Action and alternatives could include potential deployment- and operation-related impacts to wetlands resulting from ground disturbance activities. Based on the analyses in Chapters 3 through 16 the deployment and operational activities are expected to have less than significant impacts on wetlands. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Follow all applicable federal, state, and local requirements related to potential wetland impacts and permitting to avoid or minimize potential wetland impacts, compensate for unavoidable impacts to wetlands, and restore impacted wetlands;
- Follow all BMPs and mitigation measures related to minimizing soil erosion, sedimentation, and soil compaction presented in Section 19.2, Soils;
- Conduct a detailed baseline study of the wetland to be impacted, if impacts to a specific wetland are unavoidable, to aid in restoration of pre-impact condition, including, as appropriate or required by law, a survey of wetland contours; soil texture and profile; plant species, structure, and cover; and hydrology;
- Develop a SWPPP;
- Ensure that soil erosion and sediment controls are properly installed and maintained;
- Clearly mark the boundaries of wetland areas to be avoided during construction using flagging, and maintain markers until reclamation is complete (as applicable). Train equipment operators on the activities to avoid within or near wetlands;
- Segregate and salvage all topsoil up to a maximum of 12 inches of topsoil from the area disturbed in dry wetlands, where practicable, and restore topsoil to its approximate original stratum after backfilling is complete;
- Avoid temporarily storing or stockpiling materials in wetland areas or in areas that could alter wetland hydrology (causing damming and flooding) or impede or divert water (causing drying). When unavoidable, place temporary fill on geotextile fabric;

- Minimize vegetation clearing in or near wetlands. If vegetation clearing is required, minimize ground disturbance and maintain low groundcover vegetation, as well as the roots of taller vegetation;
- When construction is unavoidable, time construction to outside the breeding and migratory seasons of wetland wildlife;
- When construction is unavoidable, time construction activities to the low flow period, as defined by the USACE general permit, or to when the soil is frozen;
- Preserve existing tree canopies and natural areas in and around wetlands as much as possible;
- When cutting wetland vegetation is unavoidable, complete the work by hand (chain or hand saw) instead of using large equipment;
- Use timber mats when working in or near wetlands;
- Avoid both above and belowground wetland crossings;
- When crossing a wetland is unavoidable, take advantage of already disturbed areas such as easements, roads, roadway shoulders, bridges, or old railroad beds;
- Consider spanning a wetland by locating telecommunication poles on either side of the wetland, instead of disturbing the interior;
- Avoid diversion of surface water and groundwater sources, which could affect nearby wetlands;
- Prohibit use of herbicides or pesticides within 100 feet of any wetland (unless allowed or required by the appropriate land management, tribal, or federal, state, or local agency);
- Conduct post-construction monitoring inspections after the first growing season to determine success of revegetation, as applicable, unless otherwise required by a permit;
- Include engineered or site designed methods to control stormwater;
- Create and maintain buffer zones around wetlands to protect their functions and values;
- Develop management plans such as, but not limited to, wetland and vegetation management and restoration, water quality protection, and erosion and sediment control plans for the management of wetland habitat, vegetation, water quality, and soils/erosion control;
- Follow any BMPs and mitigation measures for work in or near wetlands developed by federal, state and local agencies, such as state departments of transportation;
- Position deployment activities to avoid wetlands to the greatest extent practicable and to minimize the project footprint while safely and practically implementing the Proposed Action;
- Install and maintain sediment barriers, as appropriate, at saturated wetlands or wetlands with standing water across the entire construction ROW upslope of the wetland boundary and where saturated wetlands or wetlands with standing water are adjacent to the construction ROW as necessary to prevent sediment flow into the wetland;

- When construction within wetlands is unavoidable, time use of heavy equipment to avoid periods of heavy moisture, as appropriate;
- Where practicable, do not maintain, store, wash, or repair equipment in or near (within 100 feet of) wetland areas to avoid spills or contamination;
- Where practicable, do not use heavy equipment within wetlands, even temporarily, and do not travel through wetlands;
- Use wide-tracked, or low-ground pressure construction equipment and/or conventional equipment operating from the ROW, timber mats, or prefabricated equipment mats. Prohibit storage of hazardous materials, chemicals, fuels, and lubricating oils in wetlands. Use existing access roads whenever possible;
- Where construction is required, maintain natural drainage patterns to the extent practicable by installing culverts in sufficient number and size to prevent ponding, diversion, or concentrated runoff;
- Use gravel for road surfaces where possible to avoid an increase in permeable surfaces and use proper drainage structures to minimize sedimentation and erosion to adjacent wetlands;
- Consult local wetland restoration guidance, including communicating with local agency and other wetland and restoration scientists. Use suggested up-to-date published restoration manuals to ensure that appropriate wetland restoration measures are followed and to increase restoration success;
- In areas where wetlands would be restored, stockpile wetland topsoil and sod mats removed during installation using standard reclamation protocol. Re-use the topsoil and sod mats in the post-construction wetland restoration;
- Revegetate, as applicable, bare areas as progressively and quickly as possible (preferably within the same growing season) to stabilize soils, reduce sedimentation, and avoid the spread of invasive species. Install erosion protection and leave in place until the area is revegetated and the soil is stabilized; and
- Determine restoration to be successful if the surface condition is similar to adjacent undisturbed communities or found acceptable by the applicable regulatory body.

19.5.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply to Wired Projects in addition to those listed above for all project types:

- New Build – Buried Fiber Optic Plant
    - Avoid, as appropriate, stockpiling material from directional drilling in a wetland, or where the stockpile could cause sedimentation into a wetland or dam water, causing flooding of a wetland area; avoid, as appropriate, setting up drilling equipment in a wetland;
    - Conduct dewatering in a manner to prevent erosion and to prevent heavily silt-laden water from flowing directly into any wetland or waterbody if dewatering an excavation;
    - Replace topsoil and restore original contours to the greatest extent practicable;

  - Install buried cable along existing road ROWs wherever possible to minimize vegetation clearing and other potential impacts to wetlands; and
  - Use structures or devices to prevent subdraining or groundwater movement along new trenched-in buried conduit such as anti-seepage collars, intermittent clay barriers, trench plugs, or clay saddles.
- New Build – Aerial Fiber Optic Plant
  - Install overhead transmission lines along existing road ROWs wherever possible to minimize vegetation clearing and other potential impacts to wetlands.
- New Build – Submarine Fiber Optic Plant
  - Avoid, as appropriate, stockpiling material from directional drilling in a wetland, or where the stockpile could cause sedimentation into a wetland or dam water, causing flooding of a wetland area; avoid, as appropriate, setting up drilling equipment in a wetland; and
  - Conduct dewatering in a manner that prevents erosion and prevents heavily silt-laden water from flowing directly into any wetland or waterbody if dewatering an excavation.

19.6. BIOLOGICAL RESOURCES

The potential for impacts to biological resources, including terrestrial vegetation, wildlife, fisheries and aquatic habitats, and threatened or endangered species, could occur through activities such as land clearing, excavation activities, construction, or operation of ground-based and aerial vehicles. Based on the analyses in Chapters 3 through 16, impacts to biological resources associated with deployment and operation of the Proposed Action are expected to be less than significant; however, potential impacts to threatened and endangered species are expected to be less than significant with the incorporation of BMPs and mitigation measures.

19.6.1. Terrestrial Vegetation

19.6.1.1. BMPs and Mitigation Measures for All Project Types

FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts to terrestrial vegetation:

- Engage in early consultation with appropriate agencies and stakeholders, including but not limited to the U.S. Fish and Wildlife Service (USFWS) and state agencies;
- Follow all applicable federal, state, and local requirements for vegetation removal, disturbance, and restoration;
- Avoid construction/deployment in areas with sensitive vegetation, unique habitat, or designated natural resources, if practicable;
- Consolidate facilities as much as possible (collocation and use of existing ROWs) to reduce vegetation loss;

- Control the spread of invasive plants and animals by inspecting and cleaning equipment and vehicles before moving from one deployment site to another;
- Identify all areas within the proposed construction footprint that contain noxious or invasive plants and use pre-construction treatments such as mowing or herbicide applications (in consultation with appropriate agencies and stakeholders) prior to ground disturbance activities;
- Minimize land clearing and vegetation disturbance by using existing roads and unvegetated areas, when feasible, during deployment activities;
- Restore disturbed areas as progressively and quickly as possible to pre-construction use and vegetation cover using appropriate and certified seed mixes and seed dispersal, management, and maintenance processes, as applicable;
- Minimize or avoid removal of forest vegetation whenever possible;
- Obtain all appropriate permits and comply with permit conditions to minimize or avoid impacts to vegetation;
- Revegetate disturbed areas as progressively and proactively as possible to minimize impacts associated with vegetation loss;
- Segregate topsoil or surface soil from subsurface layers during construction for reuse during post-construction seeding;
- Store soil containing noxious or invasive plants awaiting proper disposal, in a location away from clean topsoil and subsoil;
- Minimize construction of all roads, fences, and other ancillary facilities to reduce overall vegetation loss and habitat fragmentation;
- Inspect and clean all construction equipment and deployable vehicles on an impervious surface with high-pressure washing equipment to remove soil and plant matter prior to moving to the next job site or staging location;
- Limit construction equipment and vehicles to approved roads or ROWs;
- Use existing roads and regularly maintained areas when conducting routine maintenance and inspections to the extent feasible; and
- Use site-appropriate native plants and invasive-free materials (e.g., seed mixes, rock, mulch, soil) for revegetation and restoration efforts.

19.6.1.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

19.6.2. Wildlife

19.6.2.1. BMPs and Mitigation Measures for All Project Types

FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts to wildlife:

- Engage in early consultation with appropriate agencies and stakeholders as necessary, including but not limited to USFWS, the NMFS, and other relevant federal or state agencies;
- Follow standards and guidelines outlined by the Avian Power Line Interaction Committee and USFWS (APLIC, 2012) (APLIC and USFWS, 2005) for any aboveground lines or cables (e.g., use of diverters);
- Implement seasonal and spatial buffer zones around sensitive areas for deployment and maintenance activities, where possible, as recommended by USFWS and state wildlife and natural resources agencies;
- Implement the National Bald Eagle Management Guidelines (USFWS, 2007);
- Assess locations of roost sites for bats and timing of critical life stages (e.g., maternity and weaning periods) and hibernation for deployment and associated activities (these times vary greatly depending on region, species, and habitat);
- Avoid construction/deployment in areas with sensitive vegetation, unique habitat, or designated natural resources, if practical;
- Avoid Important Bird Areas (IBAs) and other known important bird habitats to the maximum extent practicable;
- Minimize or avoid the need for or use of sodium vapor lights at site facilities to reduce attraction of migratory birds;
- Turn off all unnecessary lighting at night;
- Install anti-perching or nesting devices on existing or new structures;
- Avoid known marine mammal haulouts or concentration areas for deployment and associated activities;
- Assess critical life stages of marine mammals in haulouts within 1 mile of deployment and associated activities;
- Consolidate facilities as much as possible (collocation and use of existing ROWs) to reduce potential habitat loss;
- Minimize construction of all roads, fences, and other ancillary facilities to reduce overall vegetation loss and habitat fragmentation;
- Control the spread of invasive animals and plants by inspecting and cleaning equipment and vehicles before moving from one deployment site to another, coordinating mowing schedules and assisting agencies and groups with ROW permits, washing mowers and equipment between sites, and educating staff;

- Develop "good housekeeping" procedures to ensure that sites would be kept clean of debris, garbage, and fugitive trash or waste during operation;
- Develop monitoring programs and adaptive management strategies;
- Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship, lambing/calving, pupping and molting [haulout period], spring/fall migrations) seasons;
- Locate project activities, facilities, and roads away from key habitats (e.g., wetlands, cays,[10] and stream sites) for amphibians and reptiles;
- Minimize herbicide and pesticide use during maintenance activities to the extent possible;
- Minimize vehicular harm of animals migrating between seasonal habitats by locating activities, roads, and infrastructure away from these areas or installing barriers along roadsides;
- Do not permit pets on site in order to avoid harassment and disturbance of wildlife;
- Follow food and waste management protocols to minimize attractants to proposed network deployment sites;
- Report observations of potential wildlife interactions, including wildlife mortality, to the appropriate agency immediately;
- Segregate topsoil or surface soil from subsurface layers during construction for reuse during post-construction seeding;
- Store soil containing noxious or invasive plants that are awaiting proper disposal in a location away from clean topsoil and subsoil;
- Use existing roads and regularly maintained areas when conducting routine maintenance and inspections to the extent feasible;
- Use site-appropriate native plants and invasive-free materials (e.g., seed mixes, rock, mulch, soil) for revegetation and restoration efforts; and
- Limit construction equipment and vehicles to approved roads or ROWs.

19.6.2.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply in addition to those listed above for all project types:

- Wired Projects
  - New Build – Aerial Fiber Optic Plant
    - Install bat exclusions on existing and new structures.

[10] Cays are small, low-elevation, sandy islands on the surface of a coral reef.

- Wireless Projects
  - New Wireless Communication Towers
    - Follow guidelines outlined by USFWS for Communication Tower Design, Siting, Construction, Operation, Retrofitting, and Decommissioning (USFWS, 2013a):

"1. Collocation of the communications equipment on an existing communication tower or other structure (e.g., billboard, water and transmission tower, distribution pole, or building mount) is strongly recommended. Depending on tower load factors and communication needs, anywhere from 6 to 10 providers should collocate on an existing tower or structure, provided that frequencies do not overlap/'bleed' or where frequency length or broadcast distance requires higher towers. New towers should be designed structurally and electronically to accommodate the applicant's antenna, and antennas of at least two additional users—ideally six to 10 additional users, if possible—unless the design would require the addition of lights and/or guy wires to an otherwise unlit and/or un-guyed tower. This recommendation is intended to reduce the number of towers needed in the future.

2. If collocation is not feasible and a new tower or towers are to be constructed, it is strongly recommended that the new tower(s) should be not more than 199 feet aboveground level (AGL), and that construction techniques should not require guy wires. Such towers should be unlighted if Federal Aviation Administration (FAA) regulations and lighting standards permit (FAA, 2007) (Patterson, J., 2012)[11]). Additionally, the Federal Communications Commission (FCC), through recent rulemaking, now requires that new towers > 450 ft AGL contain no red-steady lights. FCC also recommends that new towers 350-450 ft AGL also contain no red-steady lights, and they will eventually recommend that new towers < 350 ft AGL convert non-flashing lights to flash with existing flashing lights. LED lights are being suggested as replacements for all new construction and for retrofits, with the intent of future synchronizing of the flashes. Given these dynamics, the Service recommends using lattice tower or monopole structures for all towers < 200 ft AGL and for taller towers where feasible. The Service considers the less than 200 ft AGL option the 'gold standard' and suggests that this is the environmentally preferred industry standard for tower placement, construction, and operation—i.e., towers that are unlit, un-guyed, monopole or lattice, and less than 200 ft AGL.

3. If constructing multiple towers, the cumulative impacts of all the towers to migratory birds—especially to Birds of Conservation Concern (USFWS, 2008) and threatened and endangered species, as well as the impacts of each individual tower, should be considered during the development of a project.

[11] Current FAA guidance (USFWS, 2012) requires lighting for towers greater than 200 feet.

4. The topography of the proposed tower site and surrounding habitat should be clearly noted, especially in regard to surrounding hills, mountains, mountain passes, ridge lines, rivers, lakes, wetlands, and other habitat types used by raptors, Birds of Conservation Concern, state and federally listed species, and other birds of concern. Active raptor nests, especially those of Bald and Golden Eagles, should be noted, including known or suspected distances from proposed tower sites to nest locations. Nest site locations for Golden Eagles may vary between years, and unoccupied, inactive nests and nest sites may be re-occupied over multiple years. The Service's 2013 Eagle Conservation Plan Guidance, Module 1, Land-based Wind Energy, Version 2, available on our website, is a useful document (USFWS, 2013b).

5. If at all possible, new towers should be sited within existing 'antenna farms' (i.e., clusters of towers), in degraded areas (e.g., strip mines or other heavily industrialized areas), in commercial agricultural lands, in Superfund sites, or other areas where bird habitat is poor or marginal. Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., state of federal refuges, staging areas, rookeries, and Important Bird Areas), in known migratory, daily movement flyways, areas of breeding concentration, in habitat of threatened or endangered species, or key habitats for Birds of Conservation Concern (USFWS, 2008). Disturbance can result in effects to bird populations which may cumulatively affect their survival. The Service has recommended some disturbance-free buffers, e.g., 0.5 mi around raptor nests during the nesting season, and 1-mi disturbance free buffers for Ferruginous Hawks and Bald Eagles during nesting season in Wyoming (*[US]FWS WY Ecological Services Field Office, referenced in Manville 2007:23*). The effects of towers on 'prairie grouse,' 'sage grouse,' and grassland and shrub-steppe bird species should also be considered since tall structures have been shown to result in abandonment of nest site areas and leks, especially for 'prairie grouse' (Manville, A., 2004). The issue of buffers is currently under review, especially for Bald and Golden Eagles. Additionally, towers should not be sited in areas with a high incidence of fog, mist, and low cloud ceilings.

6. If taller (> 199 ft AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used.[12] Unless otherwise required by the FAA, only white strobe or red strobe lights (red preferable since it is generally less displeasing to the human eye at night), or red flashing incandescent lights should be used at night, and these should be the minimum number, minimum intensity (< 2,000 candela), and minimum number of flashes per minute (i.e., longest duration between flashes/'dark phase') allowable by the FAA. The use of solid (non-

[12] This guidance (USFWS, 2013a) was based on earlier FAA guidance that has since been updated. Current FAA guidance (FAA 2015) now requires lighting for towers greater than 200 feet.

flashing) warning lights at night should be avoided (Patterson, J., 2012) (Gehring et al., 2009)—see recommendation #2 above. Current research indicates that solid red lights attract night-migrating birds at a much higher rate than flashing lights (Gehring et al., 2009) (Manville, A., 2009) . Recent research indicates that use of white strobe, red strobe, or red flashing lights alone provides significant reductions in bird fatalities (Patterson, J., 2012) (Gehring et al., 2009).

7. Tower designs using guy wires for support, which are proposed to be located in known raptor or waterbird concentrations areas, daily movement routes, major diurnal migratory bird movement routes, staging areas, or stopover sites, should have daytime visual markers or bird deterrent devices installed on the wires to prevent collisions by these diurnally moving species. The efficacy of bird deterrents on guy wires to alert night migrating species has yet to be scientifically validated. For guidance on markers, see Avian Power Line Interaction Committee (APLIC). *2006*. Suggested Practices for Avian Protection on Power Lines -- State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC, and Sacramento, CA. 207 pp, and APLIC. 2012. Reducing Avian Collisions with Power Lines -- the State of the Art in 2012. Edison Electric Institute and APLIC. Washington, DC. 159 pp. Also see www.aplic.org, www.energy.ca.gov, or call 202-508-5000.

8. Towers and appendant facilities should be designed, sited, and constructed so as to avoid or minimize habitat loss within and adjacent to the tower 'footprint.' However, a larger tower footprint is preferable to the use of guy wires in construction. Several shorter, un-guyed towers are preferable to one tall guyed, lighted tower. Road access and fencing should be minimized to reduce or prevent habitat fragmentation, disturbance, the creation of barriers, and to reduce aboveground obstacles to birds in flight.

9. If it has been determined prior to tower design, siting and construction that a significant number of breeding, feeding and roosting birds—especially Birds of Conservation Concern (USFWS, 2008), state or federally-listed bird species, and eagles—are known to habitually use the proposed tower construction area, relocation to an alternate site is highly recommended. If this is not an option, seasonal restrictions on construction are advised in order to avoid disturbance, site and nest abandonment, especially during breeding, rearing and other periods of high bird activity.

10. Security lighting for on-ground facilities, equipment and infrastructure should be motion- or heat-sensitive, down-shielded, and of a minimum intensity to reduce nighttime bird attraction and eliminate constant nighttime illumination, while still allowing safe nighttime access to the site (Manville, 2011) (USFWS, 2012).

> 11. Representatives from the USFWS or researchers from the Research Subcommittee of the Communication Tower Working Group should be allowed access to the site to evaluate bird use; conduct dead-bird searches; place aboveground net catchments below the towers (USFWS, 2000); and to perform studies using radar, Global Position System, infrared, thermal imagery, and acoustical monitoring, as necessary. This will allow for assessment and verification of bird movements, site use, avoidance, and mortality. The goal is to acquire information on the impacts of various tower types, sizes, configurations and lighting protocols.
>
> 12. Towers no longer in use, not re-licensed by the FCC for use, or determined to be obsolete should be removed from the site within 12 months of cessation of use, preferably sooner.
>
> 13. In order to obtain information on the usefulness of these guidelines in preventing bird strikes and better understanding impacts from habitat fragmentation, please advise USFWS personnel of the final location and specifications of the proposed tower, and which measures recommended in these guidelines were implemented. If any of these recommended measures cannot be implemented, please explain why they are not feasible. This will further advise USFWS in identifying any recurring problems with the implementation of the guidelines, which may necessitate future modifications."

- Deployable Technologies
  - Avoid activities within migratory bird flyways and in the immediate vicinity of bat roosts to the extent practicable;
  - Do not operate aircraft at an altitude that could disturb known natural roosting sites of bats, with the only exception being severe weather conditions;
  - Do not operate aircraft at an altitude lower than 1,500 feet within 0.5 mile of known calving/lambing areas during critical life stages, with the exception only for severe weather conditions; and
  - Do not operate aircraft at an altitude lower than 1,500 feet within 0.5 mile of known seal haulouts observed on land, with the exception only for severe weather conditions.

19.6.3. Fisheries and Aquatic Habitats

19.6.3.1. BMPs and Mitigation Measures for All Project Types

FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts to fisheries and aquatic habitats:

- Engage in early consultation with appropriate agencies and stakeholders, including but not limited to USFWS, NMFS, and other relevant federal or state wildlife and natural resources agencies;

- Follow all applicable federal and state requirements for construction activities near/in fish and fish habitat;
- Establish buffers around sensitive areas (e.g., nesting sites, wetlands);
- Avoid construction, as practicable, during sensitive seasons for fish such as migration, spawning, egg development (including intra-gravel development) and larval fish (benthic or pelagic[13]) development (sensitive seasons/time periods vary by species and location);
- Avoid construction/deployment, as practicable, in productive riparian zones, marine preserves, and wetlands since construction could potentially result is less refuge for fish, fundamental changes in channel structure (e.g., loss of pool habitats), instability of stream banks, and alteration of nutrient and prey sources within the shoreline aquatic community (Hanson, Helvey, & Strach, 2005);
- Avoid physical barriers in waterbodies, to the extent practicable, during installation and operation to allow for the migration of invertebrates and other aquatic fauna;
- Avoid productive habitats to the extent practicable, such as coastal wetlands, inland waterways, essential fish habitats, spawning areas, and reefs;
- Consolidate facilities as much as possible;
- Control the spread of invasive plants and animals by inspecting and cleaning equipment and vehicles before moving from one deployment site to another;
- Implement an emergency response plan for fuel spills and environmental emergencies;
- Implement invasive species plans to minimize introduced aquatic plant and animal species into the Proposed Action areas (i.e., wash and inspect equipment and vehicles before moving from one drainage basin or watershed to the next);
- Include secondary containment for hazardous materials such as fuels and use uplands, as feasible, away from streams and waterbodies for refueling of construction or operations equipment;
- Instruct all construction employees to avoid harassment and disturbance of fish and other aquatic species, and report any signs of mortality to the appropriate agency immediately;
- Minimize construction noise in and near fish habitats, as practicable;
- Avoid vegetation removal or siting projects in areas in areas with poor bank or shoreline stability to minimize the potential for erosion and sedimentation;
- Minimize sedimentation and turbidity in fish habitats by implementing sediment and erosion control measures, as practicable; the use of such measures (e.g., silt fences, silt curtains,[14] and erosion control blankets) could reduce erosion and sedimentation;

[13] Inhabiting the water column as opposed to being associated with the sea floor; generally occurring anywhere from the surface to 1,000 meters (NOAA, 2016).

[14] Silt curtains are floating barriers used in marine construction and remediation to control silt and sediment in a body of water.

- Minimize the amount of fill placed in wetlands and streams when constructing access roads by installing bridges and or culverts. Use culverts and bridges that are appropriately designed and sized for fish passage;
- Revegetate and restore riparian areas and other vegetated areas around aquatic resources to the extent possible once construction activities are complete;
- Use setbacks when clearing vegetation for construction, where appropriate, from riparian zones to avoid removal of important fish cover such as vegetation boulders, and large woody debris;
- Use site-appropriate native plants and invasive-free materials (e.g., seed mixes, rock, mulch, soil) for revegetation and restoration efforts;
- Perform regular maintenance checks of equipment near protected areas to minimize detachment of components reaching critical habitat by tidal flow; and
- Report spills or other observed pollutants to the appropriate agency immediately.

19.6.3.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply to Wired Projects in addition to those listed above for all project types:

- New Build – Buried Fiber Optic Plant
  - Use horizontal directional drilling where possible and appropriate, for stream crossings to avoid potential impacts to the streambed, banks, and associated fish habitat.
- New Build – Aerial Fiber Optic Plant
  - Keep poles or lines clear of excess vegetation growth during equipment operation and non-operation periods.
- Use of Existing Buried or Aerial Fiber Optic Plant or Existing Submarine Cable
  - Keep poles or lines clear of excess vegetation growth during equipment operation and non-operation periods.

19.6.4. Threatened and Endangered Species and Species of Conservation Concern

19.6.4.1. BMPs and Mitigation Measures for All Project Types

To avoid or minimize potential effects of deployment activities to threatened and endangered species, BMPs and mitigation measures, as defined through consultation with the appropriate resource agency, would be implemented. Additional BMPs and mitigation measures, listed below, may be implemented as appropriate to further minimize potential impacts:

- Engage in early consultation with appropriate agencies and stakeholders including, but not limited to, USFWS, NMFS, and other relevant federal or state wildlife and natural resources agencies;

- Follow all applicable federal and state requirements for construction activities near/in fish and fish habitat;
- Avoid conducting deployment activities in areas with known locations or habitats for threatened and endangered plants;
- Avoid activities within seagrass beds and control turbidity to minimize potential indirect impacts on seagrass;
- Avoid potential impacts within coastal estuarine habitats;
- Use appropriate sediment and erosion control measures to minimize sedimentation and turbidity in fish habitats;
- Use setbacks from riparian zones when clearing vegetation for construction to avoid removal of important fish cover such as vegetation boulders and large woody debris;
- Consolidate facilities as much as possible (collocation and use of existing ROWs) to reduce potential habitat loss;
- Avoid removal or disturbance of forest vegetation to the maximum extent practicable and ensure that any unavoidable forest impacts do not result in the loss of listed snails, butterflies, bird breeding habitat, or bat roost sites or hibernacula;[15]
- Minimize construction of all roads, fences, and other ancillary facilities to reduce overall habitat fragmentation;
- Establish buffers around habitat areas, whenever possible, due to the limited range for some federally listed species;
- Implement seasonal and spatial buffer zones for operational activities that involve potentially disturbing activities in listed species use areas;
- Implement seasonal and spatial buffer zones for construction and other potentially disturbing activities during sensitive periods for listed species such as breeding, nesting, calving/pupping, haulout, migration, spawning, and egg development as identified by USFWS, the NMFS, and/or other relevant federal or state agencies;
- Avoid bat roosting areas, particularly maternity roost colonies, during critical life stages for deployment and associated activities (i.e., approximately April to November);
- Avoid or minimize the use of sodium vapor lights at site facilities to reduce attraction of migratory birds;
- Implement invasive species plans to minimize introduced aquatic plant and animal species into the areas affected by the Proposed Action (i.e., wash and inspect equipment and vehicles before moving from one drainage basin or watershed to the next);
- Control the spread of invasive plants and animals by inspecting and cleaning equipment and vehicles on an impervious surface before moving from one deployment site to another;

[15] Hibernacula are the habitats within which animals hibernate or otherwise seek refuge for extended periods.

- Develop and implement operational monitoring and adaptive management procedures;
- Follow food and waste management protocols to minimize attractants to the deployment site;
- Implement "good housekeeping" procedures to ensure that during operation the sites would be kept clean of debris, garbage, and fugitive trash or waste;
- Implement a strict policy prohibiting pets on site and prohibiting hunting or fishing or any other action that would result in any avoidable disturbance of listed species;
- Implement an emergency response plan for fuel spills and environmental emergencies;
- Include secondary containment for hazardous materials and use non-wetland sites away from streams and waterbodies for refueling of construction or operations equipment;
- Instruct all employees involved in construction/deployment activities to identify and report any sightings of listed species, to avoid harassment and disturbance of wildlife, and to not disturb or enter any nearby caves or mines;
- Minimize the use of coastal lighting, particularly in the vicinity of known turtle nesting areas. If the use of coastal lighting in sea turtle use areas is unavoidable, use turtle safe lighting instead of normal lights (i.e., low-pressure sodium-vapor lighting or red lights that emit a very narrow portion of the visible light spectrum) and consult with local sea turtle experts on the design of the coastal lighting plan;
- Report observations of sensitive species that are injured, dead, or entangled to the appropriate agency immediately;
- Train construction and deployment staff in the Proposed Action BMPs and mitigation measures and incentivize reporting of any lapses in BMP and mitigation measure implementation;
- Turn off all unnecessary lighting at night; and
- Use site-appropriate native plants and invasive-free materials (e.g., seed mixes, rock, mulch, soil) for revegetation and restoration efforts.

19.6.4.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply in addition to those listed above for all project types:

- Wired Projects
  - New Build – Aerial Fiber Optic Plant
    - Follow standards and guidelines outlined by the Avian Power Line Interaction Committee and USFWS (APLIC, 2012) *f*or any aboveground lines or cables (e.g., use of diverters) or other structures (e.g., perch and nest diverters).

- Collocation on Existing Aerial Fiber Optic Plant
  - Follow standards and guidelines outlined by the Avian Power Line Interaction Committee and USFWS (APLIC, 2012) for any aboveground lines or cables (e.g., use of diverters) or other structures (e.g., perch and nest diverters).
- Use of Existing Buried or Aerial Fiber Optic Plant or Existing Submarine Cable
  - Minimize underwater construction noise in all aquatic habitats by minimizing vessel speed, using quieter equipment or technologies, or deploying bubble curtains or other noise screens during underwater work; and
  - Implement a marine observer program during construction and operation to avoid and minimize boat strikes.

- Wireless Projects
  - New Wireless Communication Towers
    - Follow guidelines outlined by USFWS for Communication Tower Design, Siting, Construction, Operation, Retrofitting, and Decommissioning (USFWS, 2013a) mentioned above in "Wildlife."
  - Collocation on Existing Wireless Tower, Structure, or Building
    - Follow standards and guidelines outlined by the Avian Power Line Interaction Committee and USFWS (APLIC, 2012) for any aboveground lines or cables (e.g., use of diverters) or other structures (e.g., perch and nest diverters).
- Deployable Technologies
  - Restrict aircraft operation at altitudes lower than 1,500 feet within 0.5 mile of known pupping or haulout areas during critical life stages, with the exception only for severe weather conditions; and
  - Keep aircraft above altitudes higher than 1,500 feet within 0.5 mile of seals hauled out on land, with the exception only for severe weather conditions.

19.7. LAND USE, RECREATION, AND AIRSPACE

19.7.1. BMPs and Mitigation Measures for All Project Types

Implementation of the Proposed Action and alternatives could include potential deployment- and operation-related impacts to land use, recreation, and airspace resulting from activities including the construction or installation of infrastructure, or deployment of deployable assets. Based on the analyses in Chapters 3 through 16 potential impacts from the proposed activities are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Land Use
  - Follow applicable federal, state, and local land use plans and policies to ensure compatibility with existing and surrounding land uses;

- Follow and comply with applicable existing zoning requirements to ensure compatibility with existing and surrounding land uses;
- Contact appropriate agencies, property owners, and other stakeholders early in the planning process to identify potentially sensitive land uses and land use issues and concerns specific to the region;
- Sign areas, access roads, and/or easements that would require temporary closure or limited access to accommodate certain land uses;
- Schedule construction activities, where feasible, to minimize impacts to existing and surrounding land uses;
- Utilize existing roads, rights-of-way, easements, and utility corridors to the maximum extent feasible and to minimize the number of new access roads;
- Give preference to development options that involve use of existing physical infrastructure, and/or that do not involve new aboveground structures (e.g., collocation on existing structures, new buried or undersea infrastructure, etc.), especially near recreation lands;
- Select infrastructure locations that are screened from view by topography and/or vegetation, that do not require noticeable permanent changes in landforms (e.g., cut and fill) or vegetation, and that are as far from surrounding residences as possible;
- Retain existing vegetation wherever possible to provide visual screening of new infrastructure; and
- Select infrastructure designs that minimize contrast with the surrounding landscape and land uses.

- Recreation
  - Contact appropriate agencies, property owners, and other stakeholders early in the planning process to identify recreation activities specific to the region and their respective seasons;
  - Sign areas, access roads, and/or recreation trails that would require temporary closure, limited access, or detours to accommodate certain recreation activities;
  - Schedule deployment activities, where feasible, to not interfere with seasonal recreation activities;
  - Utilize existing roads, rights-of-way, easements, and utility corridors to the maximum extent feasible and to minimize the number of new access road;
  - Complete deployment activities with minor, temporary impacts to recreation resources during periods or seasons of low use;
  - Give preference to infrastructure locations that are compatible with existing park or recreation planning documents;

- Complete deployment activities, to the extent practicable, outside of and away from existing recreation locations; and
- Select infrastructure locations that are as far from recreation lands as possible.

- Airspace
  - Follow all applicable federal, state, and local requirements for preservation of the airspace to avoid or minimize reducing existing capacity, decreasing safety, negatively impacting current operations, or increasing the risk to airspace users or persons and property;
  - To the extent practicable, avoid deploying and operating wired and wireless sources near airports/facilities that trigger the need for an OE/AAA by the FAA based on height and airport elevation criteria; and
  - For new construction, prepare site plans with sufficient detail to assess potential impacts to SUAs, restricted airspace, and general and military aviation.

19.7.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply in addition to those listed above for all project types:

- Wireless Projects
  - New Wireless Communication Towers
    - Select the shortest possible structures necessary to meet the FirstNet system's needs, and only deploy towers less than 200 feet in height wherever possible;
    - Place new infrastructure near existing similar infrastructure where possible, to minimize the total number of new aerial navigation hazards;
    - Avoid placing new infrastructure near airports or the areas regulated under the FAA's Part 77 regulations (FAA, 2010); and
    - Avoid placing new infrastructure within Military Operations Areas or under Military Training Routes unless coordinated with the relevant military unit.

- Deployable Technologies
  - Coordinate early with FAA on aerial deployable technologies (flying UASs and balloon launches) to establish procedures that are in place prior to the need to use these technologies during emergency response events; and
  - Limit the use of Deployable Airborne Communications Architecture to areas less likely to be used by commercial, military, or private aviation (to the degree feasible, and in consultation with the FAA and Department of Defense).

19.8. VISUAL RESOURCES

19.8.1. BMPs and Mitigation Measures for All Project Types

Implementation of the Proposed Action could result in impacts to visual resources through the construction of towers, structures, roads, or other permanent features, as well as the installation of security or aviation lighting. Based on the analyses in Chapters 3 through 16, impacts to most visual resources associated with the deployment and operation of the Proposed Action are expected to be less than significant; however, impacts to night skies in rural areas are expected to be less than significant with the incorporation of BMPs and mitigation measures. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Proposed design should take into account the scenic character of the surrounding area to reasonably minimize or avoid visual impacts to the surrounding area when viewed from existing roadways or shorelines (design structures to complement the natural landscape; for example, use paint that blends with the surrounding landscape);
- Utilize non-reflecting coatings to towers, antennas, buildings, and associated structures where possible;
- Implement sensitive grading techniques that blend with the natural terrain;
- Treat all disturbed slopes for erosion control;
- Where appropriate, use vegetation as screens to block views of structures and roadways;
- Minimize the area of bare soil at any one time as much as possible by constructing in stages;
- Revegetate disturbed areas as progressively and quickly as practicable to restore vegetative cover;
- Reduce or eliminate the need for lighting on poles or structures, or restrict the duration and directionality of needed lighting;
- Give preference to development options that involve use of existing physical infrastructure (e.g., collocation on existing structures, new buried or undersea infrastructure, etc.), and specifically avoid the construction of new aerial fiber optic plant and/or new wireless communication towers within or in locations within sight of federal or other lands where visual resources are regulated (e.g., units of the National Park System, or areas where local zoning regulations emphasize protection of views or aesthetic conditions), or where residents and visitors have come to expect high visual quality and the absence of human-built structures;
- Select infrastructure locations that are screened from view by topography and/or vegetation, that do not require noticeable permanent changes in landforms (i.e., cut and fill) or vegetation, and that are as far from surrounding residences as possible;
- Comply with all relevant and applicable federal, state, or local regulations and guidance regarding visual and aesthetic conditions and impacts; and

- Comply with the BMPs and mitigation measures for towers required by USFWS, as detailed in Section 19.6.2, Wildlife.

19.8.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply to Deployable Technologies in addition to those listed above for all project types:

- Select parking locations for deployable technologies that are screened from view by topography or vegetation, that are as far away from as many observers as possible, and that are not in or near areas considered scenic, such as shorelines, ridgelines, or scenic roads; and
- Select deployable designs that minimize the use of nighttime lighting, that include shielded or directional nighttime lighting, and/or that use the minimum nighttime lighting required for safe operations.

19.9. SOCIOECONOMICS

19.9.1. BMPs and Mitigation Measures for All Project Types

Implementation of the Proposed Action and alternatives could include deployment and operations activities that would involve public expenditures, construction, and related activities, all of which may influence socioeconomics depending on the deployment activity and location. Based on the analyses in Chapters 3 through 16, potential impacts from the proposed activities are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Avoid development of new wireless communication towers in or near residential areas, in order to reduce the potential that such activities could have adverse impacts on residential property values. Acceptable distances could vary depending on the nature of the aesthetic impacts, the nature of other objectionable effects that influence property values, and other factors such as: residential density, local concern over aesthetics, desire for improved wireless communications, local media response, and more. According to a recent literature review, measurable adverse impacts of wireless communication towers on property values are generally not observable beyond 300 meters (984 feet), and often are not observable beyond 100 meters (328 feet) (Bond, Sims, & Dent, 2013);
- Give preference to development options that involve use of existing physical infrastructure (e.g., collocation on existing structures, buried, or undersea infrastructure, etc.);
- Select infrastructure locations that are screened from view by topography and/or vegetation, that do not require noticeable permanent changes in landforms (i.e., cut and fill) or vegetation and that are as far from surrounding residences as possible;
- Retain existing vegetation wherever possible to provide visual screening of new infrastructure;
- Select infrastructure designs that minimize contrast with the surrounding landscape;
- Select infrastructure designs that minimize construction footprints;

- Avoid development or enlargement of storage, staging, and launch/landing areas for deployable technologies in or near residential areas, in order to reduce the potential that such activities could have adverse impacts on residential property values. Acceptable distances could vary, depending on the size of the facility, types of activities occurring there, the nature of the aesthetic impacts or other aspects that influence property values, and other factors such as residential density, local concern over aesthetics, desire for improved wireless communications, local media response, and more;
- Give preference to hiring workers who are local residents, where practicable; and
- Share deployment plans with public service providers, especially first responders, as early in the process as possible and throughout the deployment process. This will provide advance notice to public service providers, and would particularly allow first responders to be better prepared for emergencies that could arise during deployment.

19.9.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

19.10. ENVIRONMENTAL JUSTICE

19.10.1. BMPs and Mitigation Measures for All Project Types

Impacts are considered environmental justice impacts only if they are both "adverse" and "disproportionately high" in their incidence on environmental justice populations relative to the general populati*on* (Council on Environmental Quality, 1997). Based on the analyses in Chapters 3 through 16, potential environmental justice impacts from the proposed activities are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Follow all BMPs identified throughout this PEIS that reduce adverse impacts of construction activities, such as generation of noise, dust, and traffic;
- Avoid setting deployment activities and facilities requiring construction in proximity to environmental justice communities, in order to reduce the potential that such activities would be seen as disproportionately affecting environmental justice communities. In general, proximity means within a distance at which noise and dust would be considered objectionable or where effects on traffic volume or patterns would be considered detrimental to local residents or businesses;
- Because of their potential impacts on property values, avoid development of new wireless communication towers in proximity to environmental justice communities in order to reduce the potential that such activities would be seen as disproportionately affecting environmental justice communities. Proximity could be defined variably depending on the nature of the aesthetic impacts, nature of other objectionable effects that influence property values, other factors (e.g., local concern over aesthetics), desire for improved wireless communications,

local media response, etc. According to a recent literature review, measurable adverse impacts on property values are generally not observable beyond 300 meters (984 feet), and often are not observable beyond 100 meters (328 feet) (Bond, Sims, & Dent, 2013);

- Where possible, identify specific communities (i.e., neighborhoods or populations that may be contained within individual block groups) that are at risk of experiencing environmental justice impacts. Conduct targeted outreach to these communities—tailored to the specific racial, ethnic, financial, and/or cultural background—as early in the development process as possible to explain the nature and extent of specific potential impacts, and to gain feedback on those impacts;
- Give preference to development options that involve use of existing physical infrastructure (e.g., collocation on existing structures, buried, or undersea infrastructure, etc.); and
- Where possible, select infrastructure locations that are not within or near environmental justice communities, particularly new build options.

19.10.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

19.11. CULTURAL RESOURCES

19.11.1. BMPs and Mitigation Measures for All Project Types

Deployment involving ground disturbance has the potential to damage or destroy archaeological sites, and the attachment of communications equipment to historic building and structures has the potential to cause damage to features that are historically significant. Based on the analyses in Chapters 3 through 16, potential impacts from the proposed activities are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures to further reduce potential impacts:

- Follow all applicable federal requirements for consultation on the identification of and assessment of effects to cultural resources;
- Avoid deployment in areas with known historic properties and deploy equipment and facilities in alternate locations if practical;
- Ensure usage of an appropriate indirect effects Area of Potential Effects as part of pre-siting or pre-deployment surveys to sufficiently account for potential indirect effects to cultural resources;
- Establish procedures for pre-deployment monitoring if a project has the potential to adversely and indirectly affect historic properties to collect baseline data, monitor potential indirect effects during deployment, and determine if effects have occurred post-deployment;
- Develop BMPs and mitigation measures as part of a Memorandum of Agreement or Programmatic Agreement to address any potential effects, if they were to occur;

- Use low-impact construction alternatives, when feasible. For instance, ripping[16] could be used as an alternative to blasting near structures or archaeological sites identified as at risk of effects from vibration. Other techniques such as bored piling could be used to minimize the vibration generated, where possible;
- Restrict the timing of deployment activities so as not to disturb the use of historic properties, as applicable. Stop work at certain times when traditional and/or religious properties are in use, such as during significant events (e.g., religious festivals or ceremonies);
- Design projects to mitigate potentially negative visual and auditory impacts of facilities. The following visual and noise abatement techniques should be considered: noise-reducing barriers, low-profile constructions, proper siting to maximize the use of topography and vegetation, screening, blending with topographic forms and existing vegetation patterns, and use of environmental coloration or advanced camouflage techniques to limit visual effects;
- Consult with site users through a community liaison team to understand site usage and how the project could affect user access; and
- Arrange alternative access using stakeholder input if access to an important cultural heritage site is restricted or blocked. Notify the public of the blockage and alternate means of access.

19.11.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures for soils beyond those listed above for all project types.

19.12. AIR QUALITY

19.12.1. BMPs and Mitigation Measures for All Project Types

The Proposed Action has the potential to generate air pollutant emissions through construction and deployment activities, including the use of large vehicles, heavy machinery, or generators. Based on the analyses in Chapters 3 through 16, the impact to air quality from the deployment and operation activities described above are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Follow all applicable federal, state, and local requirements for obtaining air pollution control permits for applicable emission sources;
- To the extent practicable, avoid constructing and operating sources in extreme or severe nonattainment areas;
- To the extent possible, avoid placement of air emission sources within Class I Areas;[17]

[16] Ripping is typically performed by a tractor or other heavy equipment to pull the rock.

[17] Class I areas are national parks and wilderness areas in attainment or unclassifiable areas that exceed 5,000 acres in size and were in existence on August 7, 1977.

- Ensure all activities are in compliance with general conformity requirements in nonattainment and maintenance areas;
- For equipment with internal combustion engines, use engines certified to the lowest emission standards and engines that burn alternative fuels (e.g., natural gas, biofuels), and/or install emission control devices when practicable;
- Use low-sulfur or ultra-low-sulfur diesel fuel in construction equipment, trucks, vehicles, and generators;
- When possible, use vehicles with hybrid or electric technology to reduce or eliminate criteria pollutant emissions from fuel combustion;
- To control dust from construction or other land-disturbing activities, spray water on roads/construction areas, limit the area of uncovered soil to the minimum needed for each activity, site staging areas to minimize fugitive dust, use a soil stabilizer (chemical dust suppressor), mulch areas or use a temporary gravel cover, limit the number and speed of vehicles on the site, and cover trucks hauling dirt;
- Post and enforce speed limits on dirt/gravel roads to reduce airborne fugitive dust;
- Limit idling time of construction vehicle and equipment and conduct proper vehicle maintenance;
- Minimize the time of operation of UAS or aircraft below the mixing height (i.e., typically estimated at 3,000 feet aboveground level);
- Use electric or alternate fueled ground support equipment for UAS or other aircraft;
- Ensure all activities conform to the State Implementation Plan;
- Follow all applicable federal, state, and local air quality requirements, including standards for nuisance (where possible) and fossil fuel-powered generators;
- Ensure all diesel engines are compliant with USEPA emission standards for the corresponding engine class;
- Ensure all equipment are appropriately sized for the Proposed Action;
- Consider using hydrogen-fueled generators where practicable to reduce nitrous oxides emissions;
- Obtain permits, where required, to install and operate fossil fuel-powered generators;[18]
- Implement a dust control plan for construction activities and any travel over unpaved roads; and
- Ensure all fuel-burning equipment including, but not limited to, heavy construction equipment, power generators, and aerial platforms are maintained in accordance with manufacturer's specifications.

[18] Permits for stationary sources (diesel generators) should be obtained in advance of future deployment.

19.12.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

19.13. NOISE

19.13.1. BMPs and Mitigation Measures for All Project Types

The Proposed Action has the potential to generate noise during construction activities, deployment, and operation of various equipment. Based on the analyses in Chapters 3 through 16, the impacts to noise from the deployment and operation activities associated with the Proposed Action are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Follow all applicable federal, state, and local requirements for construction noise restrictions;
- For those projects involving heavy equipment for deployment that can generate noise, avoid, as practicable, deployment in areas with highly sensitive receptors and construct facilities in alternate locations. Such sensitive areas include foraging or breeding areas for disturbance-sensitive congregatory species (such as some species of bats, colonial waterbirds, and seabirds), particularly those species that are listed as threatened or endangered, as well as wilderness areas (where recreational activities such as hiking, bird watching, etc. occur);
- For construction and grading activities near populated areas, heavy equipment should use noise mufflers to limit noise exposure on noise-sensitive receptors;
- For construction and grading activities near other noise sensitive receptors, including parks or other protected areas, heavy equipment should use noise mufflers to limit noise exposure, and the use of such equipment should be limited to operation only during daytime hours;
- Follow all state and federal guidelines for limiting aircraft noise on populated areas and over national parks;
- Equipment that is expected to generate significant noise should include mitigation measures during the design and implementation phases of the project (e.g., use of noise barriers such as walls, shrubbery);
- Limit construction activities to daytime hours (7 a.m. to 7 p.m.) to the extent possible when increased noise levels are more tolerable and avoid construction on Sundays and legal holidays;
- Implement BMPs and mitigation measures as directed by the local jurisdiction such as avoiding unnecessary revving of engines, switching off equipment when not in use, changing location of stationary construction equipment, minimizing drop height of materials, replacing conventional audible reversing alarms with more quiet alternative reversing warning systems, setting equipment away from noise sensitive areas (if practicable), notifying adjacent residents in advance of construction work, installing temporary acoustic barriers around

stationary construction noise sources, and other controls as needed to reduce increased noise levels; and

- Ensure, as practicable, all heavy equipment, power generators, and boats are maintained in accordance with manufacturer's specifications.

19.13.2. Project-Type Specific BMPs and Mitigation Measures

The following project-specific BMPs and mitigation measures apply in addition to those listed above for all project types:

- Wired Projects
  - New Build – Aerial Fiber Optic Plant
    - Do not permit underwater blasting and pile driving activities in any waterbody.
  - New Build – Submarine Fiber Optic Plant
    - Do not permit underwater blasting and pile driving activities in any waterbody.

19.14. CLIMATE CHANGE

19.14.1. BMPs and Mitigation Measures for All Project Types

The Proposed Action has the potential to generate GHG emissions during deployment and operation activities, which could include ground disturbing activities and the use of various equipment, machinery, and vehicles. Based on the analyses in Chapters 3 through 16, the climate change impacts from the deployment and operation activities described above are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Ensure proper sizing of both transmitting and generating equipment;
- Ensure that equipment used is the most energy efficient, or use state-of-the-art equipment to increase energy efficiency;
- Ensure that construction vehicles are running only when required for construction and reduce or limit unnecessary;
- Select energy-efficient technologies (both consuming and generating) whenever possible;
- Use renewable energy such as photovoltaic/battery/hybrid combinations where possible;
- Ensure proper loading of generating equipment during operations; and
- Rely on grid-delivered power whenever available and feasible.

Impacts on the project resulting from climate change, such as sea level rise or storm damage, would vary by state and deployment activity. BMPs and mitigation measures may have to be considered and tailored to specific sites and circumstances as each project is developed. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to address the impacts of climate change on the Proposed Action:

- Ensure design of aboveground structures and equipment has included allowances for maximum temperature and precipitation changes;
- Assess sea level rise prior to installation of infrastructure near coastal areas;
- Reinforce structures to include allowances for extreme weather events and flooding;
- Work jointly with public authorities in the implementation of monitoring plans and action plans related to potential impacts that could affect the Preferred Alternative;
- Ensure all operators and drivers have received adequate training to efficiently use equipment;
- Conduct regular maintenance and inspection on equipment to ensure that it is running at the maximum energy efficiency;
- Minimize disturbed land area and soil disturbance by collocating where it is feasible;
- Revegetate disturbed land areas after construction where it is feasible;
- Use more fuel-efficient diesel-power generation units or low-emission units such as gasoline- or hydrogen-fueled power generators; and
- Use access roads previously used during deployment activities for maintenance and operational activities.

19.14.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

19.15. HUMAN HEALTH AND SAFETY

19.15.1. BMPs and Mitigation Measures for All Project Types

Deployment involving construction activities has the potential for occupational injury to telecommunications workers. Based on the analyses in Chapters 3 through 16, the impacts to human health and safety from the deployment and operation activities are expected to be less than significant. FirstNet and/or its partners would require, as practicable or feasible, the following BMPs and mitigation measures, to further reduce potential impacts:

- Utilized trained and licensed heavy equipment operators, when available or required;
- Develop site-specific Health and Safety Plans that identify all potential physical and chemical hazards present at the site, including historic contamination;
- Develop and utilize Standard Operating Procedures for site preparation activities and include description of work practice controls and administrative control;
- Ensure workers wear proper safety equipment, such as high visibility safety vests, hard hats, steel toe boots, gloves, eye protection, and hearing protection;
- Provide daily safety meetings to review activities, potential hazards, and safety objectives;

- Avoid site preparation work in areas with high vehicle traffic volume, such as road ROWs;
- Avoid site preparation work in areas known to contain environmental contamination or mines;
- Follow all applicable federal, state, and local requirements for hazardous materials and hazardous waste management;
- Incorporate all BMPs and mitigation measures listed in Section 19.4, Water Resources, for potential impacts to water quality–sedimentation, pollutants, nutrients or water temperature, and changes to groundwater or aquifer characteristics;
- Incorporate all BMPs and mitigation measures listed in Section 19.12, Air Quality;
- Incorporate all BMPs and mitigation measures listed in Section 19.2, Soils, for potential impacts from soil erosion;
- Conduct air and noise monitoring to ensure levels stay within health-protective levels for communities and workers, and as required, that workers are trained and comply with personal protective equipment requirements as established by the Occupational Safety and Health Administration (OSHA);
- Search for the location of federal and state Superfund sites prior to site section in the area where the Proposed Action site is being considered, for new or existing infrastructure projects. If a Superfund site is located at or immediately adjacent to the Proposed Action activities, site-specific worker health and safety protection measures may be required;
- Ensure that appropriate measures are taken in compliance with applicable regulations (including Resource Conservation and Recovery Act and Comprehensive Environmental Response, Compensation, and Liability Act of 1976) if construction occurs in an area where there is the potential for legacy soil contamination, to protect workers and the public from unacceptable levels of exposure to contaminants as a result of deployment activities;
- Establish an emergency response plan (including emergency preparedness and response activities, resources, and responsibilities) to attend to specific emergencies (e.g., accidental spills) that could arise during deployment;
- Ensure that reporting requirements are followed in the event that Emergency Planning and Community Right-to-Know Act reporting thresholds are reached for the shipping, handling or storage of gasoline or diesel used for equipment and generators;[20]

[19] The main objective of the Resource Conservation and Recovery Act of 1976 is to "protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner" (USEPA, 2015a). The Comprehensive Environmental Response, Compensation, and Liability Act or Superfund law, was designed to help clean up hazardous waste sites and releases of pollutants or contaminants that may negatively affect public health (USEPA, 2015b).

[20] The Emergency Planning and Community Right-to-Know Act of 1986 was designed to assist communities in planning for emergencies related to hazardous waste. The law also requires industry to inform federal, state, and local governments on the storage, use, and releases of hazardous chemicals: 75,000 gallons for gasoline; 100,000 gallons for diesel, and 10,000 pounds for all other hazardous chemicals (USEPA, 2015c).

- Establish a grievance mechanism or other stakeholder engagement tool that is accessible and culturally appropriate for use by the community to express concerns regarding the Preferred Alternative;
- Incorporate all BMPs and mitigation measures listed in Section 19.1, Infrastructure, on potential impacts to transportation system capacity and safety;
- As needed, implement community education and public awareness about the Preferred Alternative's traffic, routes used, road signage, and safety which are particularly critical in high-risk areas;
- Use signage to clearly mark construction sites and establish boundaries and barricades to keep people out of dangerous areas;
- Make sure an incident investigation procedure is in place that can be specifically used for any near misses or incidents involving workers and community members;
- Ensure all workers are appropriately trained in wildlife identification and hazard management to minimize the likelihood of wildlife attacks;
- Ensure all workers are appropriately trained in weather hazard management and equipped with all necessary personal protective equipment to avoid potential cold stress impacts such as hypothermia and frostbite or heat-related hazards such as heat stroke;
- Incorporate all BMPs and mitigation measures listed in Section 19.13, Noise;
- Inform community members of dates and times of construction activities that are likely to generate noise at levels above 55 A-weighted decibels at the residences or workplaces of those individuals;
- Monitor land clearing and construction sites for areas of standing water, including ditches and holes in the ground, as well open receptacles (e.g., empty barrels) and fill or eliminate these hazards to prevent mosquito breeding;
- Given that no filariasis-, chikungunya-, or dengue-specific OSHA recommendations are available, follow OSHA recommended Workplace Precautions against West Nile Virus, another mosquito-borne illness for which, like chikungunya and dengue, the only preventive measure is avoidance of bites by infected mosquitoes; and

  Ensure that the appropriate medication is available for treatment of any filariasis infections that may arise in the workforce for projects located in areas where filariasis is known to occur.

19.15.2. Project-Type Specific BMPs and Mitigation Measures

There are no project-specific BMPs and mitigation measures beyond those listed above for all project types.

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20. COMPARISON OF ALTERNATIVES

20.1. INTRODUCTION

This chapter presents in summary form impact ratings for the Preferred Alternative, as well as each of the remaining alternatives outlined in Section 2.2, Description of Alternatives.

Under the Preferred Alternative, FirstNet and its partner(s) would construct a nationwide broadband long-term evolution (LTE) network using a combination of the wired, wireless, deployable, and satellite technologies. There is currently a wide range of technologies that FirstNet may use to implement and deploy the Nationwide Public Safety Broadband Network (NPSBN). Full descriptions of wired, wireless, and deployable projects that FirstNet may consider are explained in Section 2.1.2, Proposed Action Infrastructure.

Under the Deployable Technologies Alternative, FirstNet would procure, deploy, and maintain a nationwide fleet of mobile communications systems, including ground-based and aerial deployable technologies, to provide temporary coverage in areas not covered by existing, usable infrastructure. Generally, these units would be deployed at times of an incident to the affected area for either planned or unplanned incidents or events. Equipment would be stationed in every state and territory, often at multiple locations in each state or territory, to facilitate suitable response. These mobile communication units would be temporarily installed and may use existing satellite, microwave, or radio systems for backhaul.

Under the No Action Alternative, the NPSBN would not be constructed; there would be no nationwide, coordinated system dedicated to public safety interoperable communications. The existing multiplicity of communications networks would remain in place, as would the current, known limitations and problems of existing communication networks during times of emergency or disaster. This alternative would require an act of Congress to revise the Act, which currently requires the NPSBN.

This Draft Programmatic Environmental Impact Statement (PEIS) contains 17 stand-alone chapters, each of which is devoted to 1 of 16 states located in the U.S. Central region. Each of these chapters describes the Affected Environment for 15 separate resource areas, such as biological resources, land use, air quality, etc., and discusses the potential impacts of the Proposed Action in an Environmental Consequences section.

Through the programmatic approach, FirstNet has identified four categories of potential impacts on these resources:

1. *Potentially significant*;
2. *Less than significant with Best Management Practices (BMPs) and mitigation measures incorporated*;
3. *Less than significant*; or
4. *No impact*.

Two exceptions exist to this categorization of impacts based on applicable, resource-specific regulations.

For threatened and endangered species and species of conservation concern, categories of impacts are defined as: *may affect, likely to adversely affect; may affect, not likely to adversely affect;* and *no effect*. These impact categories are comparable to those defined in the *Endangered Species Consultation Handbook* (USFWS and NMFS, 1998). In Table 20.2-1, the following numeric values have been assigned for the purpose of equivalency:

1. *May affect, likely to adversely affect*;[1]
2. *May affect, not likely to adversely affect*; or
3. *No effect*.

For cultural resources, categories of impacts are defined as an *adverse effect; mitigated adverse effect; effect, but not adverse; and no effect*. These impact categories are comparable to those defined in *36 Code of Federal Regulations (CFR) 800, Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (NPS, 1983), and the U.S. National Park Service's *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (NPS, 1995). In Table 20.2-1, the following numeric values have been assigned for the purpose of equivalency:

1. *Adverse effect*;
2. *Mitigated adverse effect*;
3. *Effect, but not adverse*; or
4. *No effect*.

20.2. COMPARISON OF ALTERNATIVES

Table 20.2-1 presents impact ratings of the Preferred Action and Action Alternatives. Numerical ratings represent whole number averages of ratings across the states in the Central region, rounded conservatively to err on the side of greater potential impact significance.

Evaluation of impacts was determined by the nature of both the deployment and operation of the infrastructure associated with each Alternative considered: the Preferred Alternative and the Deployable Technologies Alternative. The specific infrastructure associated with the Deployable Technologies Alternative would be the same as the deployable technologies implemented as part of the Preferred Alternative but would likely be implemented in greater numbers, over a larger geographic extent, and used with greater frequency and duration. The Deployable Technologies Alternative would not include fixed infrastructure, such as towers or buried or aerial fiber.

As a result, impacts associated with the Project Alternatives are generally similar. Both alternatives have impacts whose significance ranges from *no impacts* to *less than significant with*

[1] For all impact ratings where a potential effect is found, full and effective implementation of mitigation is assumed.

BMPs and mitigation measures incorporated; neither alternative has potentially significant impacts. For many resources, impact ratings are identical, although some differences exist for some resource areas. For example, the Preferred Alternative would have somewhat greater impacts than the Deployable Technologies Alternative to water resources, wetlands, and visual resources. Conversely, the Deployable Technologies Alternative would have somewhat greater impacts than the Preferred Alternative to air resources. Again, neither alternative would have impacts that would be considered potentially significant.

The No Action Alternative would have no impacts, since by definition, the NPSBN would be deployed and existing conditions would not change. As required by the National Environmental Policy Act, the No Action alternative is used as a baseline against which the impacts of the Action Alternatives are compared. However, the No Action Alternative would not achieve the project's stated purpose or meet the project need as required by Title VI of the Middle Class Tax Relief and Job Creation Act of 2012 (Public Law [Pub. L.] No. 112-96, 126 Statute [Stat. 156 (2012)) (codified at 47 United States Code [U.S.C.] § 1401 et seq.); as such, it would require an act of Congress in order for the No Action Alternative to take place.

Table 20.2-1: Comparison of Alternatives by Resource Area and Type of Effect[2]

Resource Area/Type of Effect	Preferred Alternative		Deployable Technologies Alternative		No Action Alternative
	Deployment	Operations	Deployment	Operations	
Infrastructure					
• Transportation system capacity and safety	3	3	3	3	4
• Strain on capacity of local health, public safety, and emergency response services	3	3	3	3	4
• Modifies existing public safety response telecommunication practices, physical infrastructure, or level of service in a manner that directly affects public safety communication capabilities and response times	3	3	3	3	4
• Effects to commercial telecommunication systems, communications, or level of service	3	3	3	3	4
• Effects to utilities	3	3	3	3	4
Soils					
• Soil erosion	3	3	3	3	4
• Topsoil mixing	3	3	3	3	4
• Soil compaction and rutting	3	3	3	3	4
Geology					
• Seismic hazard	3	3	3	3	4
• Volcanic activity	3	3	3	3	4
• Landslide	3	3	3	3	4
• Land subsidence	3	3	3	3	4
• Potential mineral and fossil fuel resource impacts	3	3	3	3	4
• Potential paleontological resources impacts	3	3	3	3	4
• Surface geology, bedrock, topography, physiography, and geomorphology	3	3	3	3	4
Water Resources					
• Water Quality (groundwater and surface water)	3	3	3	3	4
• Floodplain degradation	3	3	3	4	4
• Drainage pattern alteration	3	3	3	4	4
• Flow alteration	4	4	4	4	4
• Changes in groundwater or aquifer characteristics	3	3	3	4	4

[2] While the analysis indicates that certain discrete locations could have higher impact ratings, this table is evaluating the potential regional impacts associated with the Proposed Action. Those potential impacts will be evaluated by FirstNet once the specific deployment locations are identified.

Resource Area/Type of Effect	Preferred Alternative		Deployable Technologies Alternative		No Action Alternative
	Deployment	Operations	Deployment	Operations	
Wetlands					
• Direct wetland loss (fill or conversion to non-wetland), other direct and indirect effects	3	3	3	3	4
Biological Resources					
• Terrestrial Vegetation	3	3	3	3	4
• Mammals	3	3	3	3	4
• Marine Mammals	3	3	3	3	4
• Birds	3	3[3]	3	3	4
• Amphibians and Reptiles	3	3	3	3	4
• Invasive species effects	3	3	3	3	4
• Terrestrial Invertebrates	3	3	3	3	4
• Fisheries and Aquatic Habitat	3	3	3	3	4
Threatened and Endangered Species and Species of Conservation Concern[4]					
• Terrestrial Vegetation	2	2	2	2	4
• Mammals	2	2	2	2	4
• Marine Mammals	2	2	2	2	4
• Birds	2	2	2	2	4
• Amphibians and Reptiles	2	2	2	2	4
• Fisheries and Aquatic Habitat	2	2	2	2	4
Land Use, Airspace, and Recreation					
• Direct land use change	3	3	4	3	4
• Indirect land use change	3	3	4	3	4
• Use of airspace (at and near site of FirstNet facility installation or deployable base)	3	3	3	3	4
• Loss of access to public or private recreation land	3	3	4	3	4
• Loss of enjoyment of public or private recreation land	3	3	4	3	4
Visual Resources					
• Adverse change in aesthetic character	3	3[5]	3	3	4
• Nighttime lighting (overall)	3	3	3	3	4
• Nighttime lighting (isolated rural areas)	3	2	3	3	4

[3] Additional BMPs and mitigation measures may be required to further reduce potential impacts to migratory birds.

[4] Categories of impacts are defined as: *may affect, likely to adversely affect; may affect, not likely to adversely affect;* and *no effect*. These impact categories are comparable to those defined in the *Endangered Species Consultation Handbook* (USFWS and NMFS, 1998).

[5] Additional BMPs and mitigation measures may be required for towers.

Resource Area/Type of Effect	Preferred Alternative		Deployable Technologies Alternative		No Action Alternative
	Deployment	Operations	Deployment	Operations	
Socioeconomics					
• Impacts to real estate	3	3	4	4	4
• Economic benefits or adverse impacts related to changes in tax revenues, wages, or direct spending (positive or negative)	3	3	3	3	4
• Employment	3	3	3	3	4
• Increased pressure on existing public services	3	4	4	4	4
Environmental Justice					
• Effects associated with other resource areas (e.g., cultural resources) that have environmental justice implications due to the affected parties (as defined by EO 12898)	3[6]	3	3	3	4
Cultural Resources[7]					
• Direct effects to historic properties[d]	3	3	3	3	4
• Indirect effects to historic properties	3	3	3	3	4
• Loss of access to historic properties	3	3	3	3	4
Air Quality					
• Increased air emissions	3	3	3	3	4
Noise					
• Increased noise levels	3	3	3	3	4
Climate Change					
• Contribution to climate change by GHG emissions	3	3	3	3	4
• Effect of climate change on Proposed Action-related impacts	3	3	3	3	4
Human Health and Safety					
• Potential exposure to hazardous materials	3	4	3	4	4
• Accidents and Injuries	3	3	3	3	4
• Exposure to Noise	3	3	3	3	4

EO = Executive Order; GHG = greenhouse gas

[a] Because public safety infrastructure is considered a critical facility, Proposed Action activities should avoid the 500-year floodplain wherever practicable per (EO 11988 and EO 13690.

[6] BMPs and mitigation measures may be required to address potential impacts to environmental justice communities at the site-specific level.

[7] Categories of impacts defined as an *adverse effect; mitigated adverse effect; effect, but not adverse; and no effect* are comparable to those defined in *36 Code of Federal Regulations (CFR) 800, Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (NPS, 1983), and the U.S. National Park Service's *National Register Bulletin: How to Apply the National Register Criteria for Evaluation* (NPS, 1995).

[b] Indirect effects are those resulting from direct effects, but they occur elsewhere in space and/or time.
[c] Wetland functions include hydrologic, ecological, geomorphic, and social functions typically assessed for wetlands as part of USACE compensatory mitigation planning. Typical functions assessed may include flood attenuation, bank stabilization, water quality, organic matter input/transport, nutrient processing, wildlife habitat, threatened and endangered.
[d] Per the National Historic Preservation Act, a "historic property" is defined as any district, archaeological site, building, structure, or object that is either listed or eligible for listing in the National Register of Historic Places (NRHP). Cultural resources present within a project's Area of Potential Effect are not historic properties if they do not meet the eligibility requirements for listing in the NRHP. Sites of religious and/or cultural significance refer to areas of concern to Indian tribes and other consulting parties that, in consultation with the respective party(ies), may or may not be eligible for listing in the NRHP. These sites may also be considered traditional cultural properties (TCPs). Therefore, by definition, these significance criteria only apply to cultural resources that are historic properties, significant sites of religious and/or cultural significance, or TCPs. For the purposes of brevity, the term historic property is used here to refer to either historic properties, significant sites of religious and/or cultural significance, or TCPs.

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21. CUMULATIVE IMPACTS

The Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) implementing regulations require an assessment of a proposed action's cumulative impacts (40 Code of Federal Regulations [CFR] Parts 1500-1508). A cumulative impact is defined as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR §1508.7). Cumulative impacts can result from minor individual actions that collectively become major actions over time (40 CFR §1508.7). CEQ's guidance for considering cumulative effects states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant" (Council on Environmental Quality, 1997b).

Section 21.1 presents the methodology used to evaluate cumulative impacts; Section 21.2 discusses other actions that may have cumulative effects when combined with the potential impacts from the proposed FirstNet deployment and operation activities. Section 21.3 identifies the cumulative impacts for the resource areas discussed in each state chapter.

21.1. CUMULATIVE IMPACTS METHODOLOGY

This section assesses the potential cumulative environmental impacts that may result from implementing the Proposed Action. FirstNet identified other projects that may be categorized as occurring in the past, present, and reasonably foreseeable future. Some of these projects were identified early based on FirstNet's awareness of the project, while others were discovered in the NEPA planning process through internet research.

Projects were selected projects using a number of different methods, such as:

- Reviewing actions recently proposed by other Federal agencies,
- Identifying relevant and current grant funding programs sponsored by the Federal government, and
- Reviewing projects recently proposed or implemented by public entities or private entities.

Cumulative impacts were assessed by resource area as impacts may arise from one or more actions, resulting in additive or interactive effects. CEQ reports that interactive effects may, in some cases, be countervailing (adverse cumulative effect is less than the sum of the individual effects) or synergistic (net adverse cumulative effect is greater than the sum of the individual effects) (Council on Environmental Quality, 1997b).

It should be noted that while the direct impacts of some individual projects were considered, there is little quantitative data available for most of the projects listed in Table 21.2-1. An integral part of this analysis for potential cumulative impacts requires a review of whether impacts from the Proposed Action could contribute to ongoing or foreseeable resource trends. The cumulative impacts analyses assesses those impacts resulting from both an Action Alternative and other past, present, and reasonably foreseeable future actions for each resource

area. As a quantitative analysis cannot be formalized, FirstNet assessed the potential cumulative impacts qualitatively.

21.2. PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE PROJECTS

CEQ defines a cumulative effect as "an impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR § 1508.7). Direct and indirect effects of a Proposed Action are considered as part of cumulative effects, as are other past, present, or reasonably foreseeable (future) projects that are related in the sense that they may affect the same resource areas.

Table 21.2-1 lists projects that FirstNet identified that could result in incremental impacts to a number of resource areas when considering the Proposed Action. FirstNet identified projects initially in its review of recent NEPA documentation, during public scoping, and from internet research. Table 21.2-1 provides the project name, geographic location, sponsor, a brief project description, and the completion year, based upon readily available information.

Table 21.2-1: Past, Present, and Reasonably Foreseeable Future Projects

Name	Location	Sponsor	Brief Description	Completion Year
Public Safety Interoperable Communications (PSIC) Grant Program	Nationwide	Department of Commerce (DOC) National Telecommunications and Information Agency (NTIA) and Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)	$1 billion (B) grant program to U.S. states and territories for the acquisition of, deployment of, or training for the use of interoperable communications systems that use (or enable interoperability with communications systems that use) reallocated public safety spectrum in the 764-776 megahertz (MHz) and 794-806 MHz bands. Grants were awarded for 6,750 projects, including the installation of 133 new freestanding and 11 new guyed towers, collocation of equipment at 2,710 existing towers and 2,710 existing facilities, 112.9 miles of fiber optic cable, more than 350 training events, and acquisition of over 75,000 radios.	2012
Broadband Technology Opportunities Program (BTOP)	Nationwide	DOC NTIA	$4.7B grant program to deploy broadband infrastructure in the U.S., expand public computer center capacity, and encourage sustainable adoption of broadband service. As of December 2015, 263 projects had completed their project activities, 17 projects remained in active status, and grant recipients had deployed more than 114,636 miles of new or upgraded network infrastructure.	Ongoing

Name	Location	Sponsor	Brief Description	Completion Year
Rural Utilities Service Broadband Initiatives Program (RUS/BIP)	Rural Areas Nationwide	U.S. Department of Agriculture (USDA)	$2.5B grant and loan program to expand access to broadband services in rural America. Of the original 320 BIP projects, 297 were for infrastructure, 4 for satellite broadband service support, and 19 for technical assistance (the majority of which went to tribal communities). As of March 2014, RUS estimated that 61,047 fiber miles and 1,391 wireless access points were installed through BIP infrastructure projects.	2015
Northern Border Activities	U.S.-Canadian border	Customs and Border Patrol (CBP)	CBP is considering several program alternatives including (1) Facilities Development and Improvement (new permanent facilities, such as Border Patrol Stations, housing, and modifications to ports of entry); (2) Detection, Inspection, Surveillance, and Communications Technology Expansion (deployment of integrated remote video surveillance systems, upgraded surveillance and telecommunications systems (e.g., remote sensors, short-range radar, remote and mobile video surveillance and communications systems, new camera systems, and upgrades to stationary communications systems), and (3) Tactical Security Infrastructure Deployment (expanding access roads and related facilities and constructing barriers, such as fencing and vehicle barriers).	Undetermined
Integrated Public Alert & Warning System (IPAWS)	Nationwide	DHS FEMA	IPAWS is a federal modernization program of the Nation's alert and warning infrastructure to protect life and property. IPAWS provides public safety officials the means to alert the general public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface. Proposed infrastructure work includes facility resiliency upgrades to radio stations, and power generation, fuel storage, and other provisions necessary to operate and maintain transmitter facilities for extended periods without access to commercial electrical power.	Undetermined

Name	Location	Sponsor	Brief Description	Completion Year
Commercial Wireless Service Providers	Nationwide	Major Wireless Service Providers	Expansion plans of commercial wireless service providers is proprietary business information. However, publically available business forecasts from tower owners provide some information regarding the relative scale and expansion plans of wireless providers, compared to the current (November 2015) baseline. For example, in a recent market analysis (http://www.fiercewireless.com/story/america-tower-t-mobile-co-locating-gear-verizon-towers-we-bought/2015-08-12), it was reported that in February 2015 Verizon agreed to lease the rights to 11,324 of its towers and sell 165 additional towers to American Tower, and that the Verizon towers are, on average, 30% taller than other carrier towers that have been sold or leased over the last several years. Therefore, American Tower now has access to more space, to add network equipment from other carriers, such as T-Mobile, which is submitting co-location applications to deploy its 700 MHz A Block spectrum to increase its long term evolution footprint to 300 million points of presence (POP) by end of 2015 (an annual increase of 10 million). The recent ownership transfer of nearly 12% of FCC-registered towers of one major wireless service provider, and a 3% annual increase of POPs for another major provider is evidence of continued high demand for existing and new telecommunication towers.	Continuing

21.3. SUMMARY OF CUMULATIVE IMPACTS

Assessing cumulative impacts for resource areas on a regional basis for unknown deployment activities at undetermined locations would be purely speculative at the programmatic level of this analysis. Therefore, the cumulative impacts analysis of individual resource areas focuses solely on those resource areas identified as having potential cumulative impacts. Table 21.3-1 provides a summary of the potential cumulative impacts by resource area.

Table 21.3-1: Summary of Potential Cumulative Impacts of FirstNet Central Region Projects with Past, Present, and Reasonably Foreseeable Projects

Resource Area	Cumulative Impacts
Infrastructure	⊙○+
Soils	⊙○
Geology	⊙○
Water Resources	⊙○
Wetlands	⊙○
Biological Resources	⊙○
T&E Species and Species of Conservation Concern	⊘⊙○
Land Use, Recreation, and Airspace	⊙○
Visual Resources	⊘⊙○
Socioeconomics	⊙○+
Environmental Justice	⊙○
Cultural Resources	⊙○
Air Quality	⊙○
Noise	⊙○
Climate Change	⊙○
Human Health and Safety	⊙○+

LEGEND

⊗ = Potentially Significant Impact
⊘ = Less than Significant Impact with BMPs and Mitigation Measures Incorporated
⊙ = Less than significant
○ = No impact
\+ = Beneficial impact

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22. OTHER REQUIRED ANALYSES

In addition to the analyses discussed in the previous state chapters, the National Environmental Policy Act (NEPA) requires an additional evaluation of the potential impacts from the Proposed Action related to unavoidable adverse impacts, any irreversible or irretrievable commitment of resources, and the relationship between local short-term and long-term productivity.

22.1. UNAVOIDABLE ADVERSE IMPACTS

The Council on Environmental Quality (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [CFR] §1502.16) require that an Environmental Impact Statement (EIS) evaluate the unavoidable adverse impacts from implementation of the Proposed Action. For this Proposed Action, the analysis indicates no significant or unavoidable adverse impacts are anticipated. Once site-specific project information is known, the potential for adverse impacts would be analyzed, as appropriate, in NEPA documentation tiered from this Programmatic EIS (PEIS).

22.2. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

CEQ's NEPA implementing regulations (40 CFR §1502.16) require that an EIS review the potential impacts to irreversible or irretrievable commitments of resources resulting from implementation of the Proposed Action. An irreversible commitment of resources refers to the loss of resource use in the future, whereas irretrievable refers to the loss of a natural resource for harvest, production, or use. These resources are irretrievable in that they would be used for a single project instead of being used for multiple purposes. An irretrievable commitment of resources is the loss of resources that cannot be replaced, recovered, or reversed. An example of irreversible commitments of resources could be the conversion of wetlands or the loss of a protected species or a cultural resource; these would be considered permanent losses.

The Proposed Action could require an irretrievable commitment of natural and manmade resources from direct consumption of fossil fuels and construction materials, depending on the deployment activities. These resources include potential building materials used during construction or renovation; energy (gas or electricity) consumed during construction and operation of facilities using mechanical systems; and human labor to develop, construct, and operate the proposed FirstNet projects as these contractors would be unable to work on other projects, and may cause temporary increases in the cost of local labor, equipment, or materials. These are considered irretrievably committed because their reuse for some other purpose would be highly likely. Potential resource commitments are shown on Table 22.2-1.

Table 22.2-1: Summary of Irreversible and Irretrievable Commitment of Resources by Resource Area

Resource Area	Irreversible Impacts	Irretrievable Impacts	Explanation
Infrastructure	No	No	Short-term obstruction or temporary disruption to local infrastructure could occur during construction of deployment activities. There would be no long-term impacts to infrastructure.
Soils	Yes	Yes	Soil lost due to potential erosion would be an irretrievable loss. There could be an irreversible commitment of resources if an undisturbed land area is selected for deployment activities.
Geology	Yes	Yes	Removal or disturbance of paleontological resources (fossils) could create irreversible and irretrievable impacts.
Water Resources and Wetlands	No	No	Deployment activities are not expected to cause any impacts to existing waterbodies, wetlands, or to exceed water quality standards.
Biological Resources	Yes	Yes	Removal or disturbance of habitat could create irreversible and irretrievable impacts.
Land Use and Recreation	Yes	No	Land use required for the deployment activities could be an irreversible impact.
Visual Resources	Yes	Yes	Obstruction of scenic or cultural areas could occur from some angles, resulting in an irreversible and irretrievable loss of visual resources. In addition, the installation of lighting in rural areas, may have irretrievable impacts to night skies.
Socioeconomic Resources	No	Yes	There could be an increased use of local contractors during construction activities, representing an irretrievable loss of workers during construction.
Environmental Justice	No	No	In general, Environmental Justice impacts across each state and the District would not include irreversible or irretrievable effects. Analyses of individual proposed projects should assess whether potential impacts to specific environmental justice communities include irreversible and/or irretrievable effects.
Cultural Resources	Yes	Yes	Removal or disturbance of previously unidentified cultural resources could result in irretrievable and irreversible impacts.
Air Quality	No	No	Project emissions are not expected to exceed federal or state air quality standards. Air quality would return to existing conditions after completion of deployment activities.
Noise	No	No	Short-term, temporary noise impacts may result during construction activities for deployment. There would be no long-term impacts to noise.
Climate Change	No	No	Greenhouse gas emissions are not expected to increase.
Human Health and Safety	No	No	Construction activities during deployment may increase human health and safety concerns. Any hazardous wastes would be disposed of properly. Conditions would return to normal after completion of deployment activities.

Where any potential irreversible or irretrievable commitments of resources are identified, they would be addressed in project specific environmental compliance documentation.

22.3. RELATIONSHIP BETWEEN SHORT-TERM AND LONG-TERM PRODUCTIVITY

CEQ's NEPA implementing regulations (40 CFR §1502.16) require that an EIS address the relationship between short-term use of the environment and the potential impacts of such use on the maintenance and enhancement of long-term productivity, particularly for beneficial uses. Such impacts can arise from choosing one action that could reduce the flexibility of pursuing other options in the future, or from selecting a specific parcel of land or other resource to a certain use that would not allow other uses to occur at the site. It is anticipated that implementation of the Proposed Action would not result in any impacts that would narrow the range of future beneficial uses of the environment because it would not pose any long-term risks to the health, safety, or the general welfare of public communities. Deployment activities would follow, where practicable and feasible, the Best Management Practices (BMPs) and mitigation measures outlined in Chapter 19, as appropriate.

FirstNet does not intend to alter the current uses of the environment. Project-specific environmental compliance reviews would be conducted to ensure all environmental laws are met. During those reviews, each project element and activity would be evaluated, and the potential long-term effects on productivity of each environmental resource area would be disclosed and discussed relative to potential trade-offs.

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Representative Mike Coffman
Representative Diana DeGette
Representative Doug Lamborn
Representative Ed Perlmutter
Representative Jared Polis
Representative Scott Tipton

Iowa
Senator Joni Ernst
Senator Chuck Grassley
Representative Rod Blum
Representative Steve King
Representative David Loebsack
Representative David Young

Illinois
Senator Richard Durbin
Senator Mark Kirk
Representative Mike Bost
Representative Cheri Bustos
Representative Danny Davis
Representative Rodney Davis
Representative Robert Dold
Representative Tammy Duckworth
Representative Bill Foster
Representative Luis Gutiérrez
Representative Randy Hultgren
Representative Robin Kelly
Representative Adam Kinzinger
Representative Darin LaHood
Representative Daniel Lipinski
Representative Mike Quigley
Representative Peter Roskam
Representative Bobby Rush
Representative Janice Schakowsky
Representative John Shimkus

Indiana
Senator Daniel Coats
Senator Joe Donnelly
Representative Susan Brooks
Representative Larry Bucshon
Representative André Carson
Representative Luke Messer
Representative Todd Rokita
Representative Marlin Stutzman
Representative Peter Visclosky
Representative Jackie Walorski
Representative Todd Young

Kansas
Senator Jerry Moran
Senator Pat Roberts
Representative Tim Huelskamp
Representative Lynn Jenkins
Representative Mike Pompeo
Representative Kevin Yoder

Michigan
Senator Gary Peters
Senator Debbie Stabenow
Representative Justin Amash
Representative Dan Benishek
Representative Mike Bishop
Representative John Conyers Jr.
Representative Debbie Dingell
Representative Bill Huizenga
Representative Daniel Kildee
Representative Brenda Lawrence
Representative Sander Levin
Representative Candice Miller
Representative John Moolenaar
Representative David Trott
Representative Fred Upton
Representative Tim Walberg

Minnesota
Senator Al Franken
Senator Amy Klobuchar
Representative Keith Ellison
Representative Tom Emmer
Representative John Kline
Representative Betty McCollum
Representative Richard Nolan
Representative Erik Paulsen
Representative Collin Peterson
Representative Timothy Walz

Missouri
Senator Roy Blunt
Senator Claire McCaskill
Representative Wm. Lacy Clay
Representative Emanuel Cleaver
Representative Sam Graves
Representative Vicky Hartzler
Representative Billy Long
Representative Blaine Luetkemeyer
Representative Jason Smith
Representative Ann Wagner

Montana
Senator Steve Daines
Senator Jon Tester
Representative Ryan Zinke

Nebraska
Senator Deb Fischer
Senator Ben Sasse
Representative Brad Ashford
Representative Jeff Fortenberry
Representative Adrian Smith

North Dakota
Senator Heidi Heitkamp
Senator John Hoeven
Representative Kevin Cramer

Ohio
Senator Sherrod Brown
Senator Rob Portman
Representative Joyce Beatty
Representative Steve Chabot
Representative Marcia Fudge
Representative Bob Gibbs
Representative Bill Johnson
Representative Jim Jordan
Representative David Joyce
Representative Marcy Kaptur
Representative Robert Latta
Representative James Renacci
Representative Tim Ryan
Representative Steve Stivers
Representative Patrick Tiberi
Representative Michael Turner
Representative Brad Wenstrup

South Dakota
Senator Mike Rounds
Senator John Thune
Representative Kristi Noem

Utah
Senator Orrin G. Hatch
Senator Mike Lee
Representative Rob Bishop
Representative Jason Chaffetz
Representative Mia Love
Representative Chris Stewart

Wisconsin
Senator Tammy Baldwin
Senator Ron Johnson
Representative Sean Duffy
Representative Glenn Grothman
Representative Ron Kind
Representative Gwen Moore
Representative Mark Pocan
Representative Reid Ribble
Representative Paul Ryan
Representative F. James Sensenbrenner Jr.

Wyoming
Senator John Barrasso
Senator Michael Enzi
Representative Cynthia Lummis

State and Local Government Agencies

Colorado
Colorado Parks and Wildlife
Colorado State Archives
Colorado Department of Natural Resource
Colorado Division of Homeland Security and Emergency Management

Illinois
Illinois Department of Natural Resources
Illinois Environmental Protection Agency
Illinois Emergency Management Agency
Illinois Historic Preservation Agency

Indiana
Indiana Department of Environmental Management
Indiana Department of Natural Resources
Indiana Department of Homeland Security
Indiana Historical Bureau

Iowa
Iowa Department of Natural Resources
Iowa Homeland Security and Emergency Management
State Historical Society of Iowa
Iowa State Historic Preservation Office

Kansas
Kansas Office of Emergency Communications
Kansas Department of Wildlife, Parks and Tourism
Kansas Division of Emergency Management
Kansas Historical Society

Michigan
Michigan Department of Environmental Quality
Michigan Department of Natural Resources
Michigan Emergency Management and Homeland Security Division
Michigan State Historic Preservation Office

Minnesota
Minnesota Department of Natural Resources
Minnesota Division of Homeland Security and Emergency Management
Minnesota Historical Society
Minnesota State Historic Preservation Office

Missouri
Missouri Department of Natural Resources

Missouri State Emergency Management Agency
Missouri Archaeological Society

Montana
Montana Department of Environmental Quality
Montana Department of Natural Resources and Conservation
Montana Disaster and Emergency Services
Montana State Historic Preservation Office

Nebraska
Nebraska Department of Natural Resources
Nebraska Emergency Management Agency
Nebraska State Preservation Office

North Dakota
North Dakota Game and Fish
North Dakota Department of Emergency Services
North Dakota Information Technology Department
State Historical Society of North Dakota

Ohio
Ohio Department of Natural Resources
Ohio Environmental Protection Agency
Ohio Emergency Management Agency
Ohio Historic Preservation Office

South Dakota
South Dakota Department of Environment and Natural Resources
South Dakota Office of Emergency Management
South Dakota State Historical Society

Utah
Utah Department of Environmental Quality
Utah Department of Natural Resource
Utah Department of Public Safety
Utah Statewide Archaeological Society

Wisconsin
Wisconsin Department of Natural Resources
Wisconsin Emergency Management
Wisconsin Historical Society

Wyoming
Wyoming Department of Environmental Quality
Wyoming Homeland Security
Wyoming Game and Fish Department

Indian Tribes

Colorado
Southern Ute Indian Tribe
Ute Mountain Ute Tribe

Iowa
Sac & Fox Tribe of the Mississippi in Iowa

Kansas
Delaware Tribe of Indians
Iowa Tribe of Kansas and Nebraska
Kickapoo Tribe in Kansas
Prairie Band Potawatomi Nation
Sac and Fox Nation of Missouri in Kansas and Nebraska

Michigan
Bay Mills Indian Community of Michigan
Grand Traverse Band of Ottawa and Chippewa Indians
Hannahville Indian Community
Keweenaw Bay Indian Community
Lac Vieux Desert Band of Lake Superior Chippewa Indians
Little River Band of Ottawa Indians
Little Traverse Bay Bands of Odawa Indians
Match-e-be-nash-she-wish Band of Pottawatomi Indians
Nottawaseppi Huron Band of the Potawatomi
Pokagon Band of Potawatomi Indians
Saginaw Chippewa Indian Tribe
Sault Ste. Marie Tribe of Chippewa Indians

Minnesota
Bois Forte Band of Chippewa Indians
Fond du Lac Band of Lake Superior Chippewa
Grand Portage Band of Lake Superior Chippewa
Leech Lake Band of Ojibwe
Lower Sioux Indian Community
Mille Lacs Band of Ojibwe
Minnesota Chippewa Tribe
Prairie Island Indian Community
Red Lake Band of Chippewa Indians
Shakopee Mdewakanton Sioux Community
Upper Sioux Community
White Earth Nation

Missouri
Eastern Shawnee Tribe of Oklahoma

Montana
Confederated Salish and Kootenai Tribes of the Flathead Reservation
Crow Tribe of Indians
Fort Belknap Indian Community
Northern Cheyenne Tribe

Nebraska
Omaha Tribe
Ponce Tribe of Nebraska
Santee Sioux Nation
Winnebago Tribe of Nebraska

North Dakota
Three Affiliated Tribes of the Fort Berthold Reservation
Spirit Lake Tribe
Standing Rock Sioux Tribe
Turtle Mountain Band of Chippewa Indians

South Dakota
Cheyenne River Sioux Tribe
Crow Creek Sioux Tribe of the Crow Creek Reservation
Flandreau Santee Sioux Tribe of South Dakota
Lower Brule Sioux Tribe
Oglala Lakota Nation
Rosebud Sioux Tribe
Sisseton-Wahpeton Oyate of the Lake Traverse Reservation
Yankton Sioux Tribe

Utah
Confederated Tribes of the Goshute Reservation
Northwestern Band of Shoshone Nation
Paiute Indian Tribe of Utah
Skull Valley Band of Goshute Indians
Ute Indian Tribe of the Uintah & Ouray Reservation

Wisconsin
Bad River Band of the Lake Superior Tribe of Chippewa Indians
Forest County Potawatomi Community
Ho-Chunk Nation
Lac Courte Oreilles Band of Lake Superior Chippewa Indians
Lac du Flambeau Band of Lake Superior Chippewa Indians
Menominee Indian Tribe
Oneida Nation of Wisconsin
Red Cliff Band of Lake Superior Chippewa
Sokaogon Chippewa Community
St. Croix Chippewa Indians of Wisconsin

Stockbridge-Munsee Community

Wyoming
Arapaho Tribe of the Wind River Reservation
Shoshone Tribe of the Wind River Reservation

Libraries

Colorado
Denver Central Library
Glenwood Springs Library
Akron Public Library
Pikes Peak Library District
Central Library
Durango Public Library
Woodruff Memorial Library
Craig-Moffat County Library
Burlington Library

Iowa
Des Mointes Central Library
Mason City Public Library
Iowa City Public Library
Spencer Public Library
Corning City Public Library
Mt. Pleasant Public Library
James Kennedy Public Library
Lamoni Public Library

Illinois
Harold Washington Library Center
Peoria Public Library
Quincy Public Library
Lincoln Library
Belleville Public Library
Stinson Memorial Library
Fairfield Public Library
Danville Public Library

Indiana
Central Library
St Joseph County Public Library
Allen County Public Library
Tippecanoe County Public Library
Central Library
Bedford Public Library
Batesville Public Library
Carnegie Library

Kansas
Kansas City, Kansas Main Library
Wichita Public Library
Dorothy Bramlage Public Library
Parsons Library
Stevens County Library
Hays Public Library
Dodge City Public Library
Goodland Public Library
Norton Public Library

Michigan
Grand Rapids Public Library
Henry Ford Centennial Library
Kalamazoo Central Library
Flint Public Library
Bad Axe Public Library
Chippewa River District Library
Peter White Public Library
Otsego County Library

Minnesota
Minneapolis Central Library
Marshall Lyon County Library
Rochester Public Library
Douglas County Library
Duluth Public Library
Detroit Lakes Public Library
International Falls Public Library
Thief River Falls Library

Missouri
The Library Center
Sikeston Library
St. Louis Public Library
Sedalia Public Library
Maryville Public Library
St Joseph Public Library
Daniel Boone Regional Library
Adair County Public Library

Montana
Billings Public Library
Bozeman Public Library
ImagineIF Kalispell Public Library
Glasgow City-County Library
Great Falls Public Library
Dillon Public Library
Missoula Public Library
Montana State Public Library

Nebraska
W. Dale Clark Library
Grand Island Library
Norfolk Public Library
Chadron Public Library
Lied Scottsbluff Public Library
Atkinson Public Library
North Platte Public Library
South Sioux City Public Library

North Dakota
North Dakota State Public Library
Dickinson Library
Williston Community Library
Minot Public Library
Fargo Public Library
Grand Forks Public Library
Alfred Dickey Public Library

Ohio
Columbus Metropolitan Library
The Public Library of Cincinnati
Athens Public Library
Cleveland Main Library
Toledo-Lucas County Public Library
Lima Public Library
Southern Branch Library
St. Clairsville Public Library

South Dakota
Rapid City Public Library
North Sioux City Public Library
South Dakota State Public Library
Watertown Regional Library
Alexander Mitchell Library
Lemmon Public Library
Hot Springs Library

Utah
Salt Lake City Public Library
Logan Library
Provo City Library
St. George Library
Grand County Library
Panguitch Library
Price Library
Uintah County Library

Wisconsin
Central Library
Steenbock Memorial Library
Brown County Central Library
L.E. Phillips Memorial Public Library
La Crosse Public Library
Vaughn Public Library
Marathon County Public Library
Beloit Public Library

Wyoming
Wyoming State Library
Rock Springs Library
Natrona County Library
Teton County Library
Campbell County Public Library
Sheridan County Fulmer Library
Park County Public Library

Media

Colorado
The Denver Post
The Gazette
The Pueblo Chieftan

Illinois
Chicago Tribune
Chicago Sun-Times
Daily Herald

Iowa
Des Moines Register
The Gazette
Quad City Times

Indianapolis
Indianapolis Star
The Times
Indianapolis Business Journal

Kansas
Wichita Eagle
Journal-World
Topeka Capital-Journal

Michigan
Detroit Free Press
The Detroit News
Lansing State Journal

Minnesota
Star Tribune
St. Paul Pioneer Press
City Pages

Missouri
St. Louis Post-Dispatch
Kansas City Star
Riverfront Times

Montana
Billings Gazette
Missoulian
Bozeman Daily Chronicle

Nebraska
Omaha World-Herald
Lincoln Journal Star
Grand Island Independent

North Dakota
Grand Forks Herald
Bismark Tribune
Inforium

Ohio
Columbus Dispatch
Dayton Daily News
The Blade

South Dakota
Argus Leader
Rapid City Journal
Daily Republic

Utah
Deseret News
Salt Lake Tribune
Standard Examiner

Wisconsin
Milwaukee Journal-Sentinel
Green Bay Press Gazette
La Crosse Tribune

Wyoming
Wyoming Tribune-Eagle
Jackson Hole News
Laramie Boomerang

25. GLOSSARY

aeolian: An environment where wind is the major agent of sediment deposition.

agroecosystems: A land use management system in which trees or shrubs are grown around or among crops or pastureland.

agroforestry: A land use management system in which trees or shrubs are grown around or among crops or pastureland.

alluvial valleys: Valleys formed by rivers.

alluvium: A sediment (clay, silt, sand, and/or gravel) deposited by flowing streams in a river valley.

alvar: "Naturally open areas of thin soil over limestone or marble bedrock, which host a distinctive vegetation community – including a considerable number of rare plants" (USEPA, 1996).

ammonia slip: An industry term for ammonia passing through the Selective Catalytic Reduction system un-reacted. This occurs when ammonia is over-injected into gas stream, temperatures are too low for ammonia to react, or catalyst has degraded.

anadromous fish: Fish born in freshwater that migrate to the ocean to grow as adults and then return to freshwater to spawn.

anchialine pools: Enclosed, landlocked waterbodies or ponds with an underground connection to both fresh and salt water.

aquatic: "Pertaining to water" (USEPA, 2016a).

aquifer: An underground layer of water-bearing permeable rock, rock fractures, or unconsolidated sediments from which groundwater can be extracted using a water well.

attainment area: Any area that meets the national primary or secondary ambient air quality standard for the pollutant.

avifauna: The birds of a particular region, habitat, or geological period.

backhaul capacity: The ability of a network to transfer data from a radio base station or cell site to a larger core network. These connections are typically made via fiber optic cable and microwave technology.

benthic: Anything associated with or occurring on the bottom of a body of water.

binge drinking: More than five drinks on one occasion for adult men and more than four drinks on one occasion for adult women.

biology: The study of living organisms, divided into many specialized fields that cover their morphology, physiology, anatomy, behavior, origin, and distribution.

biophysical settings: Settings that represent the areas of vegetation that dominate a landscape without human disturbance.

bioretention: A structural stormwater control measure that captures and temporarily stores stormwater runoff using soils and vegetation in shallow basins or landscaped areas to provide enhanced removal of dissolved stormwater pollutants, including nutrients, pesticides, organics, metals, and biological constituents.

biota: The flora and fauna of a region.

bivalve: "An aquatic mollusk whose compressed body is enclosed within a hinged shell" (USEPA, 2015).

bog: Wet, spongy ground with soil composed mainly of decayed vegetable matter.

boreal forest: Forests that consist primarily of spruces, pines, and larches.

breeding areas: "The area utilized by an organism during the reproductive phase of its lifecycle and during the time that young are reared" (USEPA, 2015).

bycatch: Unintentional capture/injury/entanglement of unwanted species during commercial fishing (e.g., a shark captured in a seine net targeting salmon).

calcareous: "Of or containing calcium carbonate, calcium, or limestone" (USEPA, 2015).

candidate species: A species officially nominated for listing as threatened or endangered, according to the Endangered Species Act.

catadromous: "An organism which lives in fresh water and goes to the sea to spawn, such as some eels" (USEPA, 2015).

cays: Small, low-elevation, sandy islands on the surface of a coral reef.

chikungunya: A mosquito-borne disease.

cistern: An artificial reservoir, usually underground used to store water.

Class I Areas: National parks and wilderness areas in attainment or unclassifiable areas that exceed 5,000 acres in size and were in existence on August 7, 1977.

climate: Chemical changes in parent material occur slowly in low temperatures. However, hot temperatures evaporate moisture, which also facilitates chemical reactions within soils. The highest degree of reaction within soils occurs in temperate, moist climates.

commercial fishery: The whole process of catching and marketing fish and shellfish for sale.

confined aquifers: Layers of groundwater that are generally bound above and below with impermeable layers of rock or sediment. Unconfined aquifers are not bound by such layers.

congregatory: The behavior of gathering in groups.

coniferous: "Cone-bearing trees, mostly evergreens, that have needle-shaped or scale-like leaves. They produce wood known commercially as softwood" (USEPA, 2015).

coral bleaching: The stress response of corals releasing the photosynthetic plankton, known as Zooxanthellae.

critical habitat: "A designated area that is essential to the conservation of an endangered or threatened species that may require special management considerations or protection" (USEPA, 2015).

crustaceans: A group of freshwater and saltwater invertebrates with jointed legs and a hard shell of chitin (e.g., shrimps, crabs, lobsters, and crayfish).

decapods: Types of crustaceans. Common crustacean examples include crayfish, crabs, and lobsters.

deciduous: "Plants having structures that are shed at regular intervals or at a given stage in development, such as trees that shed their leaves seasonally" (USEPA, 2015).

degradation: "The reduction of the capacity of the environment to meet social and ecological objectives and needs" (USEPA, 2015).

demersal: Species that live and/or feed on or near the sea floor.

dengue: A mosquito-borne disease.

depredating bird: A bird that causes resource damage, economic loss, or a threat to health and human safety.

dimension stone: Natural rock material quarried for the purpose of obtaining blocks or slabs that meet specifications as to size and shape.

direct effect: Effects that physically alter a historic property in some way.

ecoregion: "A relatively homogeneous ecological area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables" (USEPA, 2015).

ecosystem: "An interactive system that includes the organisms of a natural community association together with their abiotic physical, chemical, and geochemical environment" (USEPA, 2015).

endangered species: "Animals, birds, fish, plants, or other living organisms threatened with extinction by anthropogenic (man-caused) or other natural changes in their environment. Requirements for declaring a species endangered are contained in the Endangered Species Act" (USEPA, 2015).

endemic: Species that are only found in one area or region. Also, (of a disease or condition) regularly found among particular people or in a certain area.

energetic (climate change): Refers to strength and amplification in oscillations.

ephemeral stream: ephemeral streams carry water only as a result of precipitation (any time of year), and perennial streams carry water year round (under normal precipitation conditions).

epiphytic: Plants that live on or are attached to another plant.

erosion control blanket: Erosion control blankets are biodegradable or synthetic sheet-like materials that are rolled out onto disturbed areas to protect soil from wind and water erosion.

estuarine: Coastal areas where salt water from the sea mixes with rivers and streams, and may also be called bays, harbors, inlets, lagoons, or estuaries.

estuarine intertidal: Coastal areas usually semi-enclosed by land but have open partially obstructed access to open ocean. Water is partially diluted by freshwater runoff.

ethnographic: The systematic study of people and cultures, generally designed to explore culture from the point of view of the subject of the study.

eutrophication: A process where waterbodies receive excess nutrients that stimulate excessive plant growth.

evapotranspiration: The sum of evaporation and plant transpiration from the Earth's land and ocean surface to the atmosphere.

exotic: "A non-native plant or animal introduced from another geographic area" (USEPA, 2015).

expansive soils: "Characterized by "the presence of swelling clay materials" that absorb water molecules when wet and expand in size or shrink when dry leaving 'voids in the soil'" (Rogers, Olshansky, & Rogers, 2004).

extant: A species still in existence.

extinction: "The disappearance of a species from part or all of its range" (USEPA, 2015).

extirpated: Cease to exist in the geographic area of study.

fern allies: Plants similar to true ferns but have different leaf structures, if they have leaves at all.

forams: Single-celled organisms with shells.

fragmentation: "A process during which larger areas of habitat are broken into a number of smaller patches of smaller total area, isolated from each other by a matrix of habitats unlike the original habitat" (USEPA, 2015).

freshwater-lens systems: Systems where freshwater floats on saltwater, separated by a transition zone of brackish water, and is found in areas where groundwater is not held up by impermeable barriers.

frugivorous: Animals that eat primarily fruit.

furbearers: Mammal species traditionally trapped or hunter for their fur, such as marten, lynx, wolverine, and beaver.

geology: An interdisciplinary science with a focus on the following aspects of Earth sciences: geologic hazards and disasters, climate variability and change, energy and mineral resources, ecosystem and human health, and groundwater availability.

germanium: A mining byproduct associated with zinc production.

gestation: "The period in a female's life from conception to birth" (USEPA, 2015).

glacial: "Of or pertaining to distinctive processes and features produced by or derived from glaciers and ice sheets" (USEPA, 2015).

guts: Narrow coastal water channels usually subject to strong tidal currents flowing back and forth.

habitat: "The place where a population lives, including its living and non-living surroundings" (USEPA, 2015).

hard ground conditions: A hard site exists where noise travels away from the source over a generally flat, hard surface, such as water, concrete, hard-packed soil, or other ground surfaces having a low porosity. These are examples of reflective ground, where the ground does not provide any attenuation. The standard attenuation rate for hard site conditions is 6 A-weighted decibels (dBA) per doubling of distance for point source noise (e.g., power generators, most construction activities, etc.) and 3 dBA per doubling of distance for line sources (e.g., highway traffic, conveyor belt, etc.) (Washington State Department of Transportation, 2015).

haulouts: Areas of land or ice where seals and walrus come ashore to rest, molt, or breed.

heavy drinking: More than two drinks per day for adult men and more than one drink per day for adult women.

herbaceous: Plants that do not have woody stems.

herbivorous: "Plant-eating animal" (USEPA, 2016b).

herpetofauna: Reptiles and amphibians of a particular region, habitat, or geological period.

hibernacula: Habitats within which animals hibernate or otherwise seek refuge for extended periods.

highly migratory: Pelagic or open-water species that have a wide geographic distribution, both inside and outside countries' 200-mile zones, and undertake migrations of significant but variable distances across oceans for feeding or reproduction.

historic property: A historic property is defined as any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register [of Historic Places], including artifacts, records, and material remains related to such a property or resource" (16 U.S.C. §470(w)(5)).

hookah: A basic form of surface-supplied diving in which the air supply is via a single hose.

hotspot: A location where plumes of hot rock rise from within the earth toward the surface. Lower pressures toward the surface allow rock to melt, which can result in molten rock, volcanism, and lava flows.

human environment: The natural and the physical (e.g., structures) environment, and the association of people to those environments.

human health and safety: The existing environment for health and safety is defined by occupational and environmental hazards likely to be encountered during the construction, operation, and maintenance of towers, antennas, cables, utilities, and other equipment and infrastructure at existing and potential FirstNet telecommunication sites.

hydrology: "The way water moves and is distributed via precipitation, runoff, storage, and evaporation" (USEPA, 2015).

ice floes: A sheet of floating ice where walrus calves are typically born.

Indian tribe: The National Historic Preservation Act of 1966 defines "an Indian tribe, band, nation, or other organized group or community, including a Native village, Regional Corporation or Village Corporation, as those terms are defined in Section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. §1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians" (16 U.S.C. §470(w)).

indirect effect: Effects that are further removed in time or space and diminish some aspect of the historic property, but may not physically alter it.

inferred properties: "Soil properties inferred from the combined data of soil science and other disciplines (i.e., soil temperature and moisture regimes inferred from soil science and meteorology)" (NRCS, 2015).

infiltration basins: (Also known as recharge basins) are considered a treatment BMP because they can remove pollutants from surface discharges by capturing the stormwater runoff volume (typically, larger volumes than an infiltration trench) and infiltrating it directly to the soil rather than discharging it to an aboveground drainage system.

informed siting of Proposed Action features: Refers to the act of locating activities or features in areas that do not support listed species or their known habitats.

infrastructure: Consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure includes a broad array of facilities such as utility systems, streets and highways, railroads, airports, buildings and structures, ports, harbors, and other manmade facilities.

injurious: Any species or subspecies of animal, except game birds and game mammals, that is known to be harmful to agriculture, aquaculture, indigenous wildlife or plants, or constitute a nuisance or health hazard and is listed in the exhibit titled "Exhibit 5, Chapter 13-124, List of Species of Injurious Wildlife in Hawaii" (DLNR, 2016).

insectivorous: "An animal that feeds on insects" (USEPA, 2015).

intermittent stream: A stream that carries water for part of the year (generally in the winter and spring).

invasive species: Introduced species that out-compete native species for space and resources.

island arc: A type of archipelago, typically of volcanic origin, with an arc-shaped alignment.

invasive species: Introduced species that out-compete native species for space and resources.

jurisdictional wetlands: Wetlands that are found to be "waters of the U.S." per definitions presented in the Clean Water Act and are thus under the jurisdiction of the U.S. Army Corps of Engineers.

juvenile: "Any member of a species that is not yet sexually mature" (USEPA, 2015).

karst: "Karst is a terrain with distinctive landforms and hydrology created from the dissolution of soluble rocks, principally limestone and dolomite. Karst terrain is characterized by springs, caves, sinkholes, and a unique hydrogeology." (USGS, 2015a)

Kona winds: Stormy, rain-bearing winds that blow over the Hawaiian Islands from the southwest or south-southwest in the opposite direction of trade winds. Kona winds occur when a low-pressure center is within 500 miles northwest of the islands. Although strong, Kona winds usually do not last for more than a day or so.

lagomorphs: Gnawing mammals that feed on plants and have fully furred feet and two pairs of incisors in the upper jaw.

landslide: Refers to processes that lead to the downhill movement of earth materials due to gravity and other forces.

land subsidence: The downward settling or sudden sinking of the Earth's surface.

land use/land cover: Refers to the use of land, as visible from the air (or satellites).

latte: Large limestone or basalt pillars topped with a capstone.

lava tubes: "Lava tubes are natural conduits through which lava travels beneath the surface of a lava flow." (USGS, 2015b)

leeward: On the side sheltered from the wind (downwind).

lifecycle: The continuous sequence of development of an organism.

listed wildlife: Any animal listed as threatened or endangered by federal or state agencies.

littoral: Refers to shore or near-shore areas.

maintenance area: An area that was previously in nonattainment, but has met the national primary or secondary ambient air quality standards for the pollutant, and has been designated as in attainment.

mammal: "Warm-blooded vertebrates that give birth to and nurse live young; have highly evolved skeletal structures; are covered with hair, either at maturity or at some stage of their embryonic development; and generally have two pairs of limbs, although some aquatic mammals have evolved without hind limbs" (USEPA, 2015).

manganese nodules: Nodular concretions of manganese and iron oxides that occur on the ocean floor as a result of direct precipitation of minerals from seawater.

manholes: Access points in infrastructure (e.g., roads, rights-of-way) to underground water, sewer, and other utilities that may be used for telecommunications activities, especially in cities and urban areas, depending on the location of other utilities. In cities, power, water, and telecommunication lines are often collocated; if access is through a manhole in the street, that access will be used.

marine: "Any environment, from pond to ocean, in which plants and animals interact with the chemical and physical features of the environment" (USEPA, 2015).

marine debris: Any manmade object discarded, disposed of, or abandoned that enters the marine environment.

marine intertidal: Areas of open ocean associated with high energy coastline where the substrate is exposed and flooded by tides. (Cowardin, Carter, Golet, & LaRoe, 1979)

masonry cement: Mix, typically of Portland cement, hydrated lime, and other materials, used to improve the water retention and workability of the cement in masonry work.

maternity roosts: Locations where bats congregate to birth and rear young. Maternity roosts are often located in trees, under manmade structures (e.g., bridges, rooftops, etc.), or in caves.

mesic: "Soil condition that is medium wet" (USEPA, 2015).

metamorphic processes: A process that involves profound physical and or chemical change in rocks due to heat and pressure.

montane: Mountainous areas.

moraine: "A general term for unstratified and unsorted deposits of sediment that form through the direct action of, or contact with, glacier ice. Many different varieties are recognized on the basis of their position with respect to a glacier" (NPS, 2000).

muskeg: North American swamp or bog consisting of a mixture of water and partly dead vegetation, frequently covered by a layer of sphagnum or other mosses.

Native Hawaiian: "Any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the State of Hawaii" (16 U.S.C. §470(w)(17)).

Native Hawaiian organization: The National Historic Preservation Act of 1966 defines a Native Hawaiian organization as "any organization which serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of historic preservation that are significant to Native Hawaiians. The term includes, but is not limited to, the Office of Hawaiian Affairs of the State of Hawaii and Hui Malama I Na Kupuna O Hawai'i Nei, an organization incorporated under the laws of the State of Hawaii" (16 U.S.C. §470 (w)(18)).

noise: A form of sound caused by pressure variations that the human ear can detect; often defined as unwanted sound.

nonattainment area: Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

noxious: "Any living stage (e.g., seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health" (USFS, 2016).

obligate: Means "by necessity." The dictionary definition is: 1. Restricted to one particularly characteristic mode of life.

ocean convergence zone: "The quasi-horizontal flow of a fluid toward a common destination from different directions. When waters of different origins come together at a point or along a line (convergence line), the denser water from one side sinks under the lighter water from other side. The ocean convergence lines are the polar, subtropical, tropical, and equatorial" (NASA, 2016).

orographic effect: A change in atmospheric conditions caused by a change in elevation, primarily due to mountains.

outwash: "Glacial outwash is the deposit of sand, silt, and gravel formed below a glacier by meltwater streams and rivers. An outwash plain is an extensive, relatively flat area of such deposits" (USEPA, 2015).

Pacific Plate: A tectonic plate located within portions of the Pacific Ocean.

paleontological resources: Fossils or the physical remains of plants and animals that have mineralized into or left impressions in solid rock or sediment.

palustrine wetlands: Wetlands that include all nontidal wetlands dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand.

parent material: The original geologic source material from the soil formed affects soil aspects, including color, texture, and ability to hold water.

passerines: An order of "perching" birds that have four toes, three facing forward and one backward, which allows the bird to easily cling to both horizontal and nearly vertical perches.

pelagic: Inhabiting the water column as opposed to being associated with the sea floor; generally occurring anywhere from the surface to 1,000 meters.

Peneaeid shrimp: A family of marine crustacean that includes some of the most commercially valuable species (e.g., tiger prawn).

perched groundwater: An aquifer that occurs above the regional water table, separated by an impermeable or relatively impermeable layer of rock or sediment.

perennial streams: Streams that normally have surface flow year-round in all or part of their course. Non-perennial streams are normally dry during part of the year.

permeability: A property of a material that allows liquids or gasses to pass through it.

phenology: The seasonal changes in plant and animal lifecycles, such as emergence of insects or migration of birds.

photic zone: Zone within which light penetrates below the ocean surface.

physiography: Refers to the description of the Earth's landforms and surface features.

piggery: Pig farms.

plant associations: Plant communities of a specific type (or types) and geography (or geographies).

plateau: "An elevated plain, tableland or flat-topped region of considerable extent" (USEPA, 2015).

plutonic rocks: Rocks formed from cooling magma below the Earth's surface.

points of presence: Connections or access points between two different networks, or different components of one network.

population: "A group of interbreeding organisms occupying a particular space; the number of humans or other living creatures in a designated area" (USEPA, 2015).

portland cement: Cement that is made from limestone and clay that turns to a paste and hardens with water.

predation: The relationship between two organisms of different species in which one of them acts as predator that captures and feeds on the other organism that serves as the prey.

prehistoric sites: The physical evidence of human activity that occurred prior to European contact.

Prevention of Significant Deterioration increment: The maximum allowable increase in pollutant concentration that is allowed to occur above a baseline concentration for a pollutant.

prime farmland: Land that possesses the required characteristics for producing food, feed, fiber, and oilseed crops.

procellariiforms: An order of seabirds that includes albatrosses and petrels.

proposed species: Species that have been proposed in a *Federal Register* after the completion of a status review and consideration of other protective conservation measures.

public safety entity: An entity that provides public safety services.

public safety infrastructure: any infrastructure utilized by a public safety entity as defined in the Middle Class Tax Relief and Job Creation Act of 2012, including infrastructure associated with police, EMS, and fire services.

Pupping grounds: Sites where marine mammals birth and rear their young.

radiative forcing index: Radiative forcing is the difference between the radiation absorbed by Earth and the energy reflected back to space.

recovery: "The partial or full return of a population or community to a condition that existed before the introduction of the stressor" (USEPA, 2015).

recreational fishery: Fishing when the catch is for personal use, pleasure, or competition.

rhus: A specific genus of vines, shrubs, or small trees native to temperate and warm regions.

riparian zone: Areas near wetlands, rivers, or streams.

rock ripping: The breakup and removal of rock material with heavy equipment, such as an excavator.

runup: The height the wave reaches above sea level before washing to shore.

rutting: "Indentations in soil from operating equipment in moist conditions or soils with lower bearing strength" (USFS, 2009).

sedimentary rocks: Rocks formed by the deposition of material at the Earth's surface and within bodies of water.

Selective Catalytic Reduction: Add-on nitrogen dioxides control placed in the exhaust stream following the engine and involves injecting ammonia into the flue gas. The ammonia reacts with the nitrogen dioxides in the presence of a catalyst to form water and nitrogen.

sessile: Unable to move; attached to the substrate.

shield volcano: A volcano that is above the ocean surface, has broad and gentle slopes, and is composed of fluid basalt.

short ton: One short ton is equal to 2,000 pounds.

silt curtains: Floating barriers used in marine construction, dredging, and remediation to control silt and sediment to reach a body of water.

silt fences: Designed to trap sediment in the area where construction or soil disturbance is taking place to minimize or avoid soil erosion and sedimentation. They are often 2- to 3-feet tall and are buried 8 to 12 inches into the soil with stakes.

sink: Carbon sinks occur when natural processes absorb more carbon dioxide than they release. Examples of natural processes that serve as carbon sinks include forests, soils, oceans, and vegetation.

site fidelity: The tendency of an animal to return to a previously occupied location.

sky glow: The overall diffusion of artificial light into the sky.

soarers: Birds that fly to a considerable altitude and maintain elevation without moving their wings by using ascending air currents.

smolt: A young fish undergoing its first migration from freshwater to the ocean.

soft ground conditions: A soft site exists where noise travels away from the source over porous ground or normal unpacked earth capable of absorbing noise energy such as grass, trees, or other ground surfaces suitable for the growth of vegetation, such as farmland.

soil rut: A sunken track or groove made by vehicle or equipment activity.

sole source aquifer: An aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer.

species diversity: "An ecological measure of the variety of organisms present in a habitat" (USEPA, 2015).

stormwater filtration: Stormwater filtration structures use a filtering media (sand, soil, gravel, peat, or compost) to remove pollutants from stormwater runoff.

stratovolcanoes: Also called "composite volcanoes" and consist of alternate layers of lava and other volcanic material such as ash.

stream reach: Any specified length of a stream.

submarine volcano: Volcanoes that occur beneath the ocean surface.

subsistence fishery: Fishing when the catch is shared and consumed directly by the families and kin of the fishermen, rather than being sold.

substrate: Material such as sand and cobble that is associated with or occurs on the bottom of a body of water.

subwatershed: USGS subwatershed refers to the USGS 12 digit hydrologic unit code (HUC12), which averages approximately 40 square miles, depending on the region.

succession: "The process by which a plant or animal community successively gives way to another until a stable state is reached" (USEPA, 2015).

suicide contagion: Direct or indirect exposure to suicide or suicidal behaviors within one's family, peer group, or media reports that can result in an increase in suicide or suicidal behaviors, especially in adolescents and young adults.

symbiont: Two organisms that live in symbiosis (mutually beneficial relationship) with one another. Algae species are symbionts with corals.

take: Defined differently by various federal and state regulations, but the most commonly accepted definition is that of the U.S. Endangered Species Act, which defines it as: "to harass, harm, pursue, hunt, shoot, wound, trap, capture, collect, or attempt to engage in any such conduct."

taxonomic group: A group of biological organisms that have shared characteristics.

taxonomy: Science of naming and classifying organisms or specimens.

tectonic plate: The solid pieces of rock (or earth) that collide, move apart, or slide past each other over geologic time.

tectonism: "Structure forces affecting the deformation, uplift, and movement of the earth's crust" (USGS, 2016).

temperate forest: Forests that are found in regions with mild climates and receive heavy rainfall.

terrestrial: "Pertaining to the land" (USEPA, 2015).

threatened species: Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act.

time: Soil properties are dependent on the period over which other processes act on them.

tonne: One tonne is a unit of measure in the International System of Units that is equivalent to 1 metric ton and equivalent to 1.1023 U.S. tons, which are also known as short tons.

topography: The unique features and shapes of the land (e.g., valleys and mountains).

Total Maximum Daily Load: Maximum pollutant amounts a waterbody can receive while still meeting water quality standards.

total radiative forcing: The difference between the visible light absorbed by Earth and the energy reflected back to space.

Trachyte: A type of fine-grained volcanic rock.

traditional cultural property: A place "eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community."[1] (NPS, 1995) (NPS, 1998)

translocation: The capture, transport, and release or introduction from one location to another.

trophic structure: The way organisms utilize food resources leading to energy transfer within an ecosystem.

tsunami: Large ocean waves that form as a result of water displacement.

[1] NPS (National Park Service). 1998. *National Register Bulletin: Guidelines for Evaluating and Documenting Traditional Cultural Properties.* Accessed: September 24, 2015. Retrieved from: http://www.nps.gov/nr/publications/bulletins/nrb38/

tundra: A vast, flat, treeless Arctic region of Europe, Asia, and North America in which the subsoil is permanently frozen.

turbidity: A measure of the clarity of a liquid. When many fine particles are suspended in water, the turbidity is high.

Ultra High Frequency: UHF band covers frequencies ranging from 300 MHz to 3000 MHz.

unclassified area: Any area that cannot be classified on the basis of available information as meeting the national primary or secondary air quality standard for a pollutant.

understory: "The layer of forest located underneath the canopy. Here, smaller trees and shrubs grow, replacing older trees as they die" (USEPA, 2015).

ungulates: Classification of mammals having hooves.

U.S. Exclusive Economic Zone: A 200-mile ocean boundary around the coastline of U.S. states and territories in which the U.S. asserts exclusive commercial fishing rights.

urban: Densely developed residential, commercial, and other non-residential areas.

vascular plants: Plants that possess conducting tissues to transport nutrients and water throughout the plant.

vector: An organism that carries and transmits an infectious pathogen to another living organism.

vernal pools: Seasonal depressional wetlands that are ponded only during the wetter part of the year, also known as "ephemeral pools."

Very High Frequency: VHF band covers frequencies ranging from 30 MHz to 300 MHz.

visual landscape: What observers can readily see from a given vantage point.

water resources: Surface waterbodies and groundwater systems, including streams, rivers, lakes, canals, ditches, estuarine waters, floodplains, aquifers, wetlands, and other aquatic habitats.

watershed: USGS watershed refers to the USGS 10 digit hydrologic unit code (HUC10), which averages approximately 230 square miles, depending on the region.

wetland alternation: Any changes where the area remains a wetland and is not lost or converted, but the impacts cause a change in the type of wetland or a decrease in wetland function.

wetland loss or conversion: The actual loss of wetland habitat due to fill or conversion to a non-wetland habitat.

wetlands: "Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (USEPA, 2015).

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APPENDIX A – COOPERATING AGENCIES

Agency	Organization 1	Organization 2	Business Title	Address
Advisory Council on Historic Preservation			Assistant Director for Federal Program Development	401 F Street, NW, Suite 308 Washington, DC 20001-2637
Environmental Protection Agency	NEPA Compliance Division	Office of Federal Activities	Director	1200 Pennsylvania Avenue, NW Mail Code 2252A Washington, DC 20460
Executive Office of the President	Council on Environmental Quality		Associate Director for NEPA	722 Jackson Place, NW Washington, DC 20503
Federal Communications Commission	Wireless Telecommunications Bureau	Spectrum and Competition Policy Division	Assistant Chief, NEPA Adjudications	445 12th Street, SW Washington, DC 20554
General Services Administration	Environment Division	Public Buildings Service	Director	1800 F Street, NW Washington, DC 20405
U.S. Army Corps of Engineers	Planning and Review Division (USACE-CW-PB)		Senior Policy Advisor	441 G Street, NW Washington, DC 20314-1000
U.S. Army Corps of Engineers	Regulatory Program		Deputy Chief	441 G Street, NW Washington, DC 20314-1000
U.S. Department of Agriculture	USDA Rural Development	Rural Utilities Service	Acting Director and Senior Environmental Protection Specialist	1400 Independence Avenue, SW Mail Stop 1571, Room 2240 Washington, DC 20250-1571
U.S. Department of Agriculture	U.S. Forest Service		Assistant Director for NEPA	201 14th Street, SW Washington, DC 20250-1100
U.S. Department of Agriculture	Natural Resources Conservation Service		National Environmental Coordinator	1621 N. Kent Street Arlington, VA 22209
U.S. Department of Agriculture	Farm Service Agency		National Environmental Compliance Manager	1400 Independence Avenue, SW Washington, DC 20250
U.S. Department of Commerce	National Marine Fisheries Service	National Oceanic and Atmospheric Administration	National NEPA Coordinator	1315 East West Highway Silver Spring, MD 20910
U.S. Department of Commerce		National Oceanic and Atmospheric Administration	NEPA Policy and Compliance	1315 East West Highway Silver Spring, MD 20910
U.S. Department of Commerce	National Weather Service	National Oceanic and Atmospheric Administration	Acting Director, Office of Operational Systems	1325 East West Highway Silver Spring, MD 20910

Agency	Organization 1	Organization 2	Business Title	Address
U.S. Department of Commerce	National Telecommunications and Information Administration		NEPA Compliance Specialist	1401 Constitution Avenue, NW Washington, DC 20230
U.S. Department of Defense	Operational Environmental Planning and Readiness	Office of the Chief of Naval Operations	Environmental Planning/NEPA Lead	2000 Navy Pentagon Washington, DC 20350-2000
U.S. Department of Defense	Department of the Air Force		Senior Planner/NEPA Program Manager	1260 Air Force Pentagon Washington, DC 20330-1260
U.S. Department of Defense	National Guard Bureau		NEPA Team Leader	111 South George Mason Drive Arlington, VA 22204
U.S. Department of Energy	Office of NEPA Policy and Compliance		Director	1000 Independence Avenue, SW Mailstop GC-54 Washington, DC 20585
U.S. Department of Health and Human Services	Division of Emergency and Environmental Health Services	Centers for Disease Control and Prevention	Director	Chamblee Building, Room 6007 Chamblee, GA 30341-3717
U.S. Department of Homeland Security	Office of Environmental Planning and Historic Preservation	Federal Emergency Management Agency	Environmental Officer	1800 South Bell Street Arlington, VA 22202
U.S. Department of Homeland Security	Office of Environmental Management	U.S. Coast Guard	Chief	2703 Martin Luther King Jr. Ave, SE Washington, DC 20593-7714
U.S. Department of Homeland Security	Environmental and Energy Division	U.S. Customs and Border Protection	Director	1300 Pennsylvania Avenue, NW Washington, DC 20229
U.S. Department of Homeland Security	Sustainability and Environmental Programs		Director	301 Seventh Street, SW Washington, DC 20528
U.S. Department of Justice	Natural Resources Section	Environment and Natural Resources Division	NEPA Coordinator	P.O. Box 7611 Washington, DC 20044
U.S. Department of Justice	Federal Bureau of Investigation		Environmental Program Specialist	935 Pennsylvania Avenue, NW Room WB-460 Washington, DC 20535
U.S. Department of the Interior	Division of Environmental and Cultural Resources Management	Bureau of Indian Affairs	Chief	2051 Mercator Drive Reston, VA 20191
U.S. Department of the Interior	Division of Decision Support, Planning, and NEPA	Bureau of Land Management	Senior NEPA Specialist	1849 C Street, NW Washington, DC 20240-0001
U.S. Department of the Interior	Policy and Administration, Water and Environmental Resources Office	Bureau of Reclamation	Environmental Specialist	P.O. Box 25007 Denver, CO 80225
U.S. Department of the Interior	Environmental Planning and Compliance Division	National Park Service	Chief	P.O. Box 25287 Denver, CO 80225-0287

Agency	Organization 1	Organization 2	Business Title	Address
U.S. Department of the Interior	Office of Environmental Affairs	Office of Policy, Management, and Budget	Director	1849 C Street, NW Washington, DC 20240-0001
U.S. Department of the Interior	Division of Migratory Bird Management	U.S. Fish and Wildlife Service	Wildlife Biologist	5275 Leesburg Pike Falls Church, VA 22041
U.S. Department of the Interior	Environmental Management Branch	U.S. Geological Survey	Chief	12201 Sunrise Valley Drive Reston, VA 20192
U.S. Department of the Interior	U.S. Fish and Wildlife Service		NEPA Coordinator	4401 North Fairfax Drive MS-800 Arlington, VA 22203
U.S. Department of Transportation	Office of Environment and Energy	Federal Aviation Administration	Environmental Protection Specialist	800 Independence Avenue, SW Washington, DC 20591
U.S. Department of Transportation	Office of Project Development and Environmental Review	Federal Highway Administration	Senior Environmental Protection Specialist	1200 New Jersey Avenue, SE Washington, DC 20590
U.S. Department of Transportation	Office of Railroad Development	Federal Railroad Administration	Environmental Program Manager	1200 New Jersey Avenue, SE Washington, DC 20590

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First Responder Network Authority Nationwide Public Safety Broadband Network Programmatic Environmental Impact Statement

Scoping Summary Report

Overview

The First Responder Network Authority (FirstNet), an independent authority within the Department of Commerce (DOC), is preparing five regional Programmatic Environmental Impact Statements (PEIS) to evaluate the potential impacts of establishing of a nationwide, interoperable, public safety broadband network (NPSBN) based on a single national network architecture. Title VI of the Middle Class Tax Relief and Job Creation Act of 2012 (Public Law No. 112-96, 126 Stat. 156 (codified at 47 U.S.C. 1401 *et seq.*) charges FirstNet with taking all actions necessary to ensure the building, deployment, and operation of NPSBN, by, at a minimum:

- Ensuring nationwide standards for use and access to the network;
- Issuing open, transparent, and competitive requests for proposals to the private sector;
- Encouraging use of existing commercial wireless infrastructure to speed deployment; and
- Managing and overseeing the implementation and execution of contracts or agreements with non-Federal entities to build, operate, and maintain the network.

FirstNet has determined that a PEIS is the appropriate level of environmental review under the National Environmental Policy Act of 1969 (NEPA). FirstNet will use the NEPA planning process to encourage agency and public involvement in the review of the proposed projects. Public involvement allows for full and fair discussion of the project scope and potential environmental impacts. By providing a means for open communication between FirstNet and the public, the procedural aspects of NEPA promote better decision-making.

The Council of Environmental Quality (CEQ) regulations (40 Code of Federal Regulation [CFR] Parts 1500-1508) provide guidance on opportunities for public participation. This report provides an overview of the FirstNet PEIS scoping activities, including the public scoping meetings and comments received during the comment period.

Public Notification

On November 12, 2014, FirstNet published a Notice of Intent (NOI) in the *Federal Register* to initiate a 45-day scoping comment period (79 Federal Register [FR] 67156). The NOI, provided in **Appendix A**, identified that FirstNet would be developing regional PEISs and solicited input from the public on potential concerns associated with the Proposed Action and purpose and need, and provided background information on the project. The NOI also included an announcement of PEIS scoping meetings. Issuance of the NOI commenced a 45-day public scoping period that ended on December 29, 2014.

FirstNet placed advertisements in local newspapers to invite the public to the scoping meetings identifying the dates and locations. Publication of the notices occurred in the following papers:

- Washington Post and Washington Post Express (November 23, 2014)
- Honolulu Star-Advisor(November 30, 2014)
- San Francisco Chronicle (November 30, 2014)
- Arizona Republic and Arizona Daily Star (November 30, 2014)
- Kansas City Star (December 7, 2014)
- The Times-Picayune (December 7, 2014)
- New York Times (December 14, 2014)

Copies of the newspaper notices are included in **Appendix B**.

Scoping Meetings

FirstNet held seven in-person scoping meetings throughout the nation. These meetings provided the general public and interested stakeholders opportunities to learn about the proposed action, talk directly with FirstNet environmental staff, and provide input regarding the scope of the analysis and alternatives. Organized as informal gatherings, the scoping meetings provided the public with an opportunity to learn about FirstNet, alternative ways to implement the NPSBN that will be analyzed in the PEISs, and the overall NEPA process, as well as provide comments and input to the FirstNet team. FirstNet held scoping meetings at the following locations:

- *Washington, D.C.* - Tuesday, November 25, 2014; 4-8 p.m.
  Department of Commerce lobby, 1401 Constitution Avenue NW, Washington, DC 20230
- *Honolulu, HI* - Tuesday, December 2, 2014; 4-8 p.m.
  Neal Blaisdell Center, 777 Ward Avenue, Honolulu, HI 96814
- *San Francisco, CA* - Thursday, December 4, 2014; 4-8 p.m.
  Holiday Inn Civic Center, 50 Eighth Street, San Francisco, CA 94103
- *Tucson, AZ* - Thursday, December 4, 2014; 4-8 p.m.
  Embassy Suites – Williams Center, 5335 E. Broadway Boulevard, Tucson, AZ 85711
- *Kansas City, MO* - Tuesday, December 9, 2014; 4-8 p.m.
  Kansas City University of Medicine and Biosciences, Classroom Annex Building, Classroom A, 1750 East Independence Avenue, Kansas City, MO 64106
- *New Orleans, LA* - Thursday, December 11, 2014; 5-9 p.m.
  Loyola University, Thomas Hall, 6363 St. Charles Avenue, New Orleans, LA 70118
- *New York, NY*- Monday, December 15, 2014; 4-8 p.m.
  New York University, Kimmel Center Grand Hall, 60 Washington Square South, New York, NY 10012

Each scoping meeting included a poster session that allowed individuals to review posters describing the proposed action, purpose and need, alternatives considered, geographic scope, and the NEPA process. The posters and handouts provided at the meetings are included in **Appendix C**. At each meeting, attendees could fill out a comment card and sign up for the distribution list.

Attendance lists from the meetings are included in **Appendix D**. A total of 19 people attended the seven scoping meetings. FirstNet received written comments from 48 individuals and organizations (one commenter submitted two comments). Table 1 provides the breakdown of comments received for each meeting and during the scoping comment period. Comments received both via U.S. Postal Service mail and electronically (email) were counted once as U.S. Postal Service.

Table 1. Summary of Scoping Period Comments Received

Comment Format	Number
Scoping Meetings	
November 25, 2014 (Washington, DC)	
Attendees	6
Written Comments	0
December 2, 2014 (Honolulu, HI)	
Attendees	0
Written Comments	0
December 4, 2014 (San Francisco, CA)	
Attendees	0
Written Comments	0
December 4, 2014 (Tucson, AZ)	
Attendees	2
Written Comments	0
December 9, 2014 (Kansas City, MO)	
Attendees	3
Written Comments	0
December 11, 2014 (New Orleans, LA)	
Attendees	4
Written Comments	1
December 15, 2014 (New York, NY)	
Attendees	4
Written Comments	0
Email	41
U.S. Postal Service Mail	7
Total Attendees	19
Total Comments	49

Summary of Comments

The public and local agencies raised several concerns during the scoping comment period. FirstNet reviewed the comments received and grouped them by resource area or PEIS topic. Table 2 summarizes the general concerns raised during scoping.

Table 2. Summary of Comments Received during Scoping

Issues/Concerns
• Agencies to provide FirstNet with State-specific environmental compliance information and points of contact
• Agencies to provide FirstNet with contacts within their local organizations and trade organizations
• Concern that placement of towers would impact historic/recreational/ecological study use of a specific area (i.e., new tower in Tucson, AZ at/on Tumamoc Hill or in/near the historic district)

Table 3 provides a summary of the comments received from federal agencies, state agencies, and local government organizations; comments are paraphrased and condensed from the actual comments. The environmental analysis included in the PEIS will rely on the full text of the comments as submitted. Copies of the comments received are included in **Appendix E. Appendix F** provides FirstNet responses to the comments received.

Table 3. Summary of Comments Received from Federal, State, and Local Government

Agency / Interest Group	Comment Summary
Federal Government	
U.S. Environmental Protection Agency, Region 9 (Ann McPherson)	• Notification of areas of particular concern, including impacts to water, air, biological resources, invasive species, and habitat protection. • Included information regarding suggested content for particular topics and resource areas.
State Government	
Virginia Department of Environmental Quality (Ellie Irons)	• Request for Federal Consistency Determination under the Coastal Zone Management Act
Virginia Department of Environmental Quality (Mark Alling)	• Water: ensure that construction best management practices will be used to avoid erosion and sedimentation; provide point of contact for wetland permits and for construction and stormwater permits • Waste: ensure that hazardous and solid waste be disposed of according to VA regulations; provide point of contact for hazardous and solid waste concerns
Local Government Organizations	
Orleans Parish Communications District (Catherine Cargo)	• Provide outreach to Neighborhood Empowerment Network Association (NENA), Association of Public-Safety Communications Officials (APCO), and their local chapters
Pima County, Arizona, District 5 Supervisor (Richard Elias)	• Concern that FirstNet activities may affect cultural resources in Tucson, AZ (i.e., Tumamoc Hill)

Appendix A: Notice of Intent

Notices

Federal Register
Vol. 79, No. 218
Wednesday, November 12, 2014

This section of the FEDERAL REGISTER contains documents other than rules or proposed rules that are applicable to the public. Notices of hearings and investigations, committee meetings, agency decisions and rulings, delegations of authority, filing of petitions and applications and agency statements of organization and functions are examples of documents appearing in this section.

DEPARTMENT OF COMMERCE

Census Bureau

Proposed Information Collection; Comment Request; Survey of Housing Starts, Sales, and Completions

AGENCY: U.S. Census Bureau, Commerce.

ACTION: Notice.

SUMMARY: The Department of Commerce, as part of its continuing effort to reduce paperwork and respondent burden, invites the general public and other Federal agencies to take this opportunity to comment on proposed and/or continuing information collections, as required by the Paperwork Reduction Act of 1995.

DATES: To ensure consideration, written comments must be submitted on or before January 12, 2015.

ADDRESSES: Direct all written comments to Jennifer Jessup, Departmental Paperwork Clearance Officer, Department of Commerce, Room 6616, 14th and Constitution Avenue NW., Washington, DC 20230 (or via the Internet at *jjessup@doc.gov*).

FOR FURTHER INFORMATION CONTACT: Requests for additional information or copies of the information collection instrument(s) and instructions should be directed to Erica Filipek, U.S. Census Bureau, MCD, CENHQ Room 7K057, 4600 Silver Hill Road, Washington, DC 20233, telephone (301) 763–5161 (or via the Internet at *Erica.Mary.Filipek@census.gov*).

SUPPLEMENTARY INFORMATION:

I. Abstract

The U.S. Census Bureau plans to request a three-year extension of the current Office of Management and Budget (OMB) clearance of the Survey of Housing Starts, Sales and Completions, also known as the Survey of Construction (SOC). The SOC collects monthly data on new residential construction from a sample of owners or builders. The Census Bureau uses the Computer-Assisted Personal Interviewing (CAPI) electronic questionnaires SOC–QI/SF.1 and SOC–QI/MF.1 to collect data on start and completion dates of construction, physical characteristics of the structure (floor area, number of bathrooms, type of heating system, etc.), and if applicable, date of sale, sales price, and type of financing. The SOC provides widely used measures of construction activity, including the economic indicators Housing Starts and Housing Completions, which are from the New Residential Construction series, and New Residential Sales.

We sample about 1,700 new buildings each month (20,400 per year). We inquire about the progress of each building multiple times until it is completed (and a sales contract is signed, if it is a single-family house that is built for sale). For single-family buildings, we conduct an average of 8.17 interviews and for multifamily buildings, we conduct an average of 7.0 interviews. The total number of interviews conducted each year for single-family buildings is about 107,844 and for multifamily buildings is about 50,400. Each interview takes 5 minutes on average. Therefore, the total annual burden is 13,187 hours.

II. Method of Collection

The Census Bureau uses its field representatives to collect the data. The field representatives conduct interviews to obtain data.

III. Data

OMB Control Number: 0607–0110.
Form Number(s): SOC–QI/SF.1 and SOC–QI/MF.1.
Type of Review: Regular submission.
Affected Public: Individuals or households, business, or other for-profit institutions.
Estimated Number of Respondents: 20,400.
Estimated Time per Response: 5 minutes.
Estimated Total Annual Burden Hours: 13,187.
Estimated Total Annual Cost to Public: The estimated cost to the respondent is $404,841 based on an average hourly pay for the respondent of $30.70. This estimate was taken from the Department of Labor, Bureau of Labor Statistics, Occupational Employment Statistics Survey for 2013.
Respondent's Obligation: Voluntary.
Legal Authority: Title 13 U.S.C. 182.

IV. Request for Comments

Comments are invited on: (a) Whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency's estimate of the burden (including hours and cost) of the proposed collection of information; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques or other forms of information technology.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of this information collection; they also will become a matter of public record.

Dated: November 6, 2014.

Glenna Mickelson,

Management Analyst, Office of the Chief Information Officer.

[FR Doc. 2014–26734 Filed 11–10–14; 8:45 am]

BILLING CODE 3510–07–P

DEPARTMENT OF COMMERCE

National Telecommunications and Information Administration

First Responder Network Authority

[Docket Number: 141104926–4926–01]

RIN 0660–XC014

Notice of Intent To Prepare Programmatic Environmental Impact Statements and Conduct Scoping for the Nationwide Public Safety Broadband Network

AGENCY: First Responder Network Authority, National Telecommunications and Information Administration, U.S. Department of Commerce.

ACTION: Notice of Intent.

SUMMARY: The First Responder Network Authority (''FirstNet'') announces its intent to prepare five regional

Programmatic Environmental Impact Statements (''PEISs'') and conduct public scoping meetings to evaluate the potential environmental impacts of the proposed nationwide public safety broadband network. The specific locations, dates, and times for the scoping meetings will be announced on the FirstNet Web site, no later than one week prior to each meeting.

DATES: The scoping period for this notice will begin on the date of publication of this notice and will end December 29, 2014. Comments to this notice must be submitted on or before December 29, 2014.

ADDRESSES: The public is invited to submit written comments to this Notice. Written comments may be submitted electronically via email to *PEIScomments@firstnet.gov* or by mail (to the address listed in **FOR FURTHER INFORMATION CONTACT**). Comments received will be made a part of the public record and may be posted to FirstNet's Web site (*www.firstnet.gov)* without change. Comments should be machine readable and should not be copy-protected. All personally identifiable information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Amanda Pereira, NEPA Coordinator, First Responder Network Authority, National Telecommunications and Information Administration, U.S. Department of Commerce, 12201 Sunrise Valley Drive, M/S 243, Reston, VA 20192.

SUPPLEMENTARY INFORMATION: The Middle Class Tax Relief and Job Creation Act of 2012 (Pub. L. 112–96, Title VI, 126 Stat. 256 (codified at 47 U.S.C. 1401 *et seq.*)) (the ''Act'') created and authorized FirstNet to take all actions necessary to ensure the building, deployment, and operation of an interoperable, nationwide public safety broadband network (''NPSBN'') based on a single, national network architecture. The Act meets a long-standing and critical national infrastructure need, to create a single, nationwide network that will, for the first time, allow police officers, fire fighters, emergency medical service professionals, and other public safety entities to effectively communicate with each other across agencies and jurisdictions.

The National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347) (''NEPA'') requires federal agencies to undertake an assessment of environmental effects of their proposed actions prior to making a final decision and implementing the action. NEPA requirements apply to any federal project, decision, or action that may have a significant impact on the quality of the human environment. NEPA also establishes the Council on Environmental Quality (''CEQ''), which issued regulations implementing the procedural provisions of NEPA (see 40 CFR parts 1500–1508). Among other considerations, CEQ regulations at 40 CFR 1508.28 recommend the use of *tiering* from a ''broader environmental impact statement (such as a national program or policy statements) with subsequent narrower statements or environmental analysis (such as regional or basin wide statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.''

Due to the geographic scope of FirstNet (all 50 states, the District of Columbia, and five territories) and the diversity of ecosystems potentially traversed by the project, FirstNet has elected to prepare five regional PEISs. The five PEISs will be divided as follows:

East	Central	West	South	Non-contiguous
Delaware	Colorado	Arizona	Alabama	Alaska
District of Columbia	Illinois	California	Arkansas	American Samoa
Connecticut	Indiana	Idaho	Florida	CNMI
Maine	Iowa	Nevada	Georgia	Guam
Maryland	Kansas	Oregon	Kentucky	Hawaii
Massachusetts	Michigan	Washington	Louisiana	Puerto Rico
New Hampshire	Minnesota		Mississippi	U.S. Virgin Islands
New Jersey	Missouri		New Mexico	
New York	Montana		North Carolina	
Pennsylvania	Nebraska		Oklahoma	
Rhode Island	North Dakota		South Carolina	
Vermont	Ohio		Tennessee	
Virginia	South Dakota		Texas	
West Virginia	Utah			
	Wisconsin			
	Wyoming			

Once a PEIS is completed and a Record of Decision (ROD) is signed, the proposed FirstNet projects can begin to submit the site-specific environmental documentation to determine if the proposed project has been adequately evaluated in the PEIS or warrants a Categorical Exclusion, an Environmental Assessment, or an Environmental Impact Statement.

Dated: November 6, 2014.

Genevieve Walker,

Director of Environmental Compliance, First Responder Network Authority.

[FR Doc. 2014–26772 Filed 11–10–14; 8:45 am]

BILLING CODE 3510–TL–P

DEPARTMENT OF COMMERCE

National Telecommunications and Information Administration

First Responder Network Authority

Special Meeting of the First Responder Network Authority Board Finance Committee

AGENCY: First Responder Network Authority, National Telecommunications and Information

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Appendix B: Newspaper Notice

Made of mushrooms and wasp spit, the drone goes green

Students' plan could solve the mess made by crashing robots

BY RACHEL FELTMAN

A group of college students has created an environmentally friendly drone — think veggie leather.

Led by one of NASA's synthetic biology experts, the students made an unmanned aerial vehicle almost entirely out of biodegradable materials. After a crash, these little fliers would basically disappear.

Drones can be a great help in dealing with environmental issues, flying into protected wooded areas to count the surviving population of an endangered animal, or over remote coral reefs to assess their condition.

But sometimes they can turn into litter: If a drone goes down in a protected area, it might not be possible for anyone to retrieve the hunk of metal and plastic.

"I have colleagues who do remote sensing in sensitive areas, and there was a UAV lost for a couple months in an area you really wouldn't want to lose one in," said Lynn Rothschild of NASA's Ames Research Center.

Rothschild serves as an adviser for a team competing in the International Genetically Engineered Machine competition, and the issue of downed-drone litter seemed like a good one for her group to tackle.

"Normally I just give them free reign, but then there are 15 very bright students who all want to do 15 or 30 different things," she said. "So this year, I suggested an overall project. But they really just ran with it from there."

One of her students found a company called Ecovative Design that was growing the team's dream material: Blocks of fungal foam.

Mushrooms are made up of a structure called mycelium. It grows looking almost like a spider web when it's spread out, but it can grow to fit the confines it's placed in, eventually forming a tough chunk of foamy material. By putting mycelium into a mold filled with a tasty growing medium — like dead leaves or straw — you can create a custom-shaped mushroom block. Or in this case, a custom-shaped mushroom drone frame. A blast of heat kills the mycelium to stop its growth.

"You end up with this great material that just leftover fungal bits," Rothschild said.

To make the frame more durable, the students created a bioplastic to coat it.

You can make a kind of veggie leather using bacteria that create cellulose — the tough stuff that creates cell walls in plants. The bacterial cellulose is grown in a sheet and harvested, then wrapped around the mycelium frame. When it dries, it's tough and hard.

But the team's biohacking didn't stop there: They also harnessed the power of the insect world to keep their drone from dissolving in midair. The drone is covered in proteins cloned from paper wasp saliva, which the insects use to waterproof their nests.

For now, that's as far as the drone's biodegradability goes: It still uses a traditional rotor, battery and controls. But other researchers around the world are working on creating biodegradable versions of these components, Rothschild said. And her team is investigating the use of biological sensors, which would allow them to replace some of the sensors on the drone with bacteria.

"Eventually, I'd say that most, if not all, of the drone could be made from biological materials," she said.

Rothschild is excited about the ways the drone could be used in research on Earth, but she has bigger plans for them, too: She has already submitted a proposal to NASA to push this technology forward for Mars missions. The lightweight, unobtrusive, home-grown nature of the robots would make them perfect for use on the red planet.

More at washingtonpost.com/blogs/**speaking-of-science**

Islamic State kills tribesmen in Iraq

REUTERS

BAGHDAD — Islamic State militants have killed at least 25 members of a Sunni Muslim tribe in a village on the eastern edge of the provincial capital Ramadi, local officials said Saturday, in apparent revenge for tribal opposition to the radical Islamists.

They said the bodies of the men from the Albu Fahd tribe were discovered by the Iraqi army when it launched a counteroffensive against the Islamic State forces near the capital of Anbar province.

Last month, Islamic State fighters killed hundreds of members of the Albu Nimr tribe in Anbar in an attempt to break local resistance to their advances in the Sunni Muslim province they have largely controlled for nearly a year.

Islamic State, which has seized control of large parts of Syria and Iraq, continues to gain territory in Anbar despite three months of U.S.-led airstrikes.

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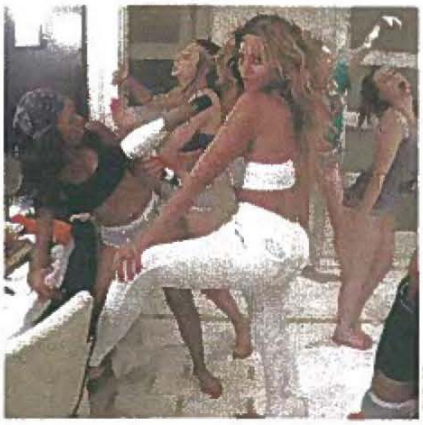


"The video is a low-budget, no frills look at the super-silly side of the hottest woman in entertainment."

NEHA PRAKASH AT MASHABLE.COM analyzes the music video dropped late Friday by Beyonce. For "7/11," a surprise single from the singer's four-disc Platinum Edition Box Set, due out today, the DIY-esque video features Beyonce twerking, doing the Harlem Shake and wearing a "kale" sweatshirt.

"That was one of the most disrespectful headlines I have ever read."

COMMENTER DERRICFROMDC AT TMZ.COM is outraged by celebrity news website TMZ's headline announcing the death of former D.C. Mayor Marion Barry. When TMZ posted the article Sunday morning, headlined "CRACK MAYOR DEAD AT 78," it prompted outrage on social media. A petition asking TMZ to apologize for and remove the distasteful headline garnered more than 10,000 signatures by Sunday evening.

"Can I just say how much I love that every single comment here is pointing out the superiority of the single blade razor?"

COMMENTER NATHAN LOFTIES AT FACEBOOK.COM finds the main takeaway of a photo posted last week by Gillette to its Facebook page. In honor of its 110th anniversary, the men's razor maker posted an image of its 1904 patent alongside the 2014 swiveled version. Instead of commending its innovation and how far the technology has come, most users spoke of their disappointment in the product's evolution.

AFFIDAVIT OF PUBLICATION

IN THE MATTER OF
Interested in the Nationwide Public Safety Broadband Network?

STATE OF HAWAII }
} SS.
City and County of Honolulu }

Doc. Date: DEC - 1 2014 **# Pages:** 1

Notary Name: Patricia K. Reese First Judicial **Circuit**

Doc. Description: Affidavit of Publication

PATRICIA K. REESE NOTARY PUBLIC Comm. No. 86-467 STATE OF HAWAII

Notary Signature DEC - 1 2014 Date

Lisa Kaukani being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of Oahu Publications, Inc. publisher of The Honolulu Star-Advertiser and MidWeek, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the aforementioned newspapers as follows:

Honolulu Star-Advertiser 1 times on:
11/30/2014

Midweek Wed. 0 times on:

_____ times on:

And that affiant is not a party to or in any way interested in the above entitled matter.

Lisa Kaukani

Subscribed to and sworn before me this 1ST day of December A.D. 2014

Patricia K. Reese, Notary Public of the First Judicial Circuit, State of Hawaii

My commission expires: Oct 07, 2018

PATRICIA K. REESE NOTARY PUBLIC Comm. No. 86-467 STATE OF HAWAII

Interested in the Nationwide Public Safety Broadband Network?

You're invited to attend a public scoping meeting to start the environmental review of the First Responder Network Authority (FirstNet) Nationwide Public Safety Broadband Network (NPSBN).

December 2, 2014 from 4-8 PM
Neal Blaisdell Center
Hawaii Suites 7 and 8 (located behind the box office)
777 Ward Avenue
Honolulu, HI 96814

Drop by any time during meeting hours to get information and give input on the scope of this programmatic environmental study. Comments accepted via mail to Ms. Amanda Pereira, NEPA Coordinator, FirstNet, 12201 Sunrise Valley Drive, M/S 243, Reston, VA 20192, or via e-mail to PEIScomments@firstnet.gov through close of business December 29, 2014. For more information, please visit www.firstnet.gov.
(SA692549 11/30/14)

Ad # 0000692549

SP.NO.: _____ L.N.

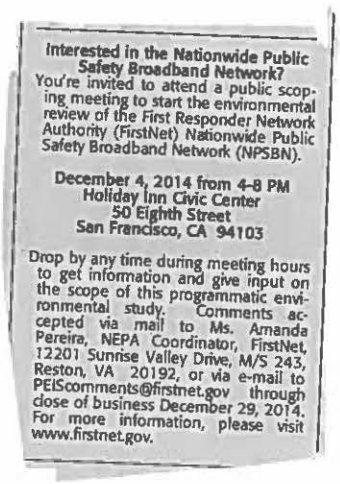
DECLARATION OF PUBLICATION OF
SAN FRANCISCO CHRONICLE

Lori Gomez

Declares that:
The annexed advertisement has been regularly published In the

SAN FRANCISCO CHRONICLE

Which is an was at all times herein mentioned established as newspaper of general circulation in the City and County of San Francisco, State of California, as the term is defined by Section 6000 of the Government Code



Interested in the Nationwide Public Safety Broadband Network?
You're invited to attend a public scoping meeting to start the environmental review of the First Responder Network Authority (FirstNet) Nationwide Public Safety Broadband Network (NPSBN).

December 4, 2014 from 4–8 PM
Holiday Inn Civic Center
50 Eighth Street
San Francisco, CA 94103

Drop by any time during meeting hours to get information and give input on the scope of this programmatic environmental study. Comments accepted via mail to Ms. Amanda Pereira, NEPA Coordinator, FirstNet, 12201 Sunrise Valley Drive, M/S 243, Reston, VA 20192, or via e-mail to PEIScomments@firstnet.gov through close of business December 29, 2014. For more information, please visit www.firstnet.gov.

SAN FRANCISCO CHRONICLE

(Name of Newspaper)

901 Mission Street

San Francisco, CA 94103

From 11/30/14

To 11/30/14

Namely on 11/30/14

(Dates of Publication)

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 12/4/14

At San Francisco, California

ARIZONA DAILY STAR

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Debbie Capanear, being first duly sworn deposes and says: that she is the Advertising Representative of **TNI PARTNERS,** a General Partnership organized and existing under the laws of the State of Arizona, and that it prints and publishes the Arizona Daily Star, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached ad was printed and

Legal Notice

published correctly in the entire issue of the said Arizona Daily Star on each of the following dates, to-wit:

NOVEMBER 30, 2014

Debbie Capanear

Subscribed and sworn to before me this 3 day of December, 2014

Lydia Fimbres

Notary Public

LYDIA FIMBRES
Notary Public - Arizona
Pima County
My Comm. Expires Oct 18, 2015

My commission expires

AD NO. 8316430

Interested in the Nationwide Public Safety Broadband Network?

You're invited to attend a public scoping meeting to start the environmental review of the First Responder Network Authority (FirstNet) Nationwide Public Safety Broadband Network (NPSBN).

December 4, 2014 from 4-8 PM
Embassy Suites – Williams Center
5335 E. Broadway Blvd
Tucson, AZ 85711

Drop by any time during meeting hours to get information and give input on the scope of this programmatic environmental study. Comments accepted via mail to Ms. Amanda Pereira, NEPA Coordinator, FirstNet, 12201 Sunrise Valley Drive, M/S 243, Reston, VA 20192, or via e-mail to PEIScomments@firstnet.gov through close of business December 29, 2014. For more information, please visit www.firstnet.gov.

Publish November 30, 2014 • Arizona Daily Star

Interested in the Nationwide Public Safety Broadband Network?

You're invited to attend a public scoping meeting to start the environmental review of the First Responder Network Authority (FirstNet) Nationwide Public Safety Broadband Network (NPSBN).

Kansas City University of Medicine and Biosciences

Classroom Annex Building, Classroom A
1750 East Independence Avenue
Kansas City, MO 64106

Drop by any time during meeting hours to get information and give input on the scope of this programmatic environmental study. Comments accepted via mail to Ms. Amanda Pereira, NEPA Coordinator, FirstNet, 12201 Sunrise Valley Drive, M/S 243, Reston, VA 20192, or via e-mail to PEIScomments@firstnet.gov through close of business December 29, 2014. For more information please visit www.firstnet.gov.

METRO AREA BRIEFS

Police arrest suspect in Algiers shooting death

New Orleans police have arrested the man they say fatally shot a 30-year-old man Sunday night in Algiers. Jeremie Bailey, 26, was picked up Wednesday at his mother's home in Marrero and booked with second-degree murder and aggravated battery. He is accused of killing Cornell Glover, according to police and court records. Authorities found Glover shot multiple times in the 3300 block of De Armas Street. Police credited "witness participation" with helping detective Tindell Murdock identify Bailey as the suspected shooter. Bailey appeared in court Thursday, where records show his bond was set at $650,000.

Man found fatally shot in the 7th Ward

New Orleans police are investigating the shooting death of a man Saturday morning in the 7th Ward. The incident was reported before 7:30 a.m. in the 1500 block of North Roman Street. When officers arrived, they found an unidentified man fatally shot in the grass, police said. Dozens of people gathered in the block. A young woman consumed with grief collapsed and wailed. "That can't be my husband. He promised he'd never leave me." Homicide Detective Joseph Jefferson is in charge of the investigation. Anyone with information is asked to call Crimestoppers at 504.822.1111.

Victim ID'd in shooting near Tulane and Broad

Authorities on Friday identified the victim of a fatal shooting near New Orleans police headquarters. Ronald Rudolph, 31, was shot multiple times Thursday night in the 2600 block of Gravier Street, according to the Orleans Parish Coroner's Office. Police found Rudolph around 10:20 p.m., within a block of NOPD headquarters and the Orleans Parish Criminal District Courthouse. He was taken to a hospital, where he was pronounced dead. Several yellow evidence markers dotted the sidewalk in front of Falstaff Apartments, formerly home to the Falstaff brewery, as investigators searched for clues along Gravier. A group of four people lingered outside the yellow police tape, marveling at the apparent brazenness of shooting someone so close to police headquarters. "How could you feel safe when this building has a million cameras, and police are right here?" asked one of the onlookers, who wished to remain anonymous. "How can that be safe?"

LaPlace man arrested for mailed marijuana

A LaPlace man has been jailed on a charge of receiving a pound of high-grade marijuana via the U.S. Postal Service, authorities said Friday. The marijuana was mailed from Los Angeles to a fictitious person at an Edgard address and ended up at the Edgard post office, according to the after St. John the Baptist Parish Sheriff's Offices. Deputies obtained a search warrant for the package. After 35-year-old Alan Burl collected it, they executed the warrant, found the marijuana and arrested him Thursday, the Sheriff's Office said. They estimated the marijuana's street value at $5,600. Burl was booked with possession with intent to distribute marijuana, driving on a suspended license and driving without a rear-view mirror. He remained in custody Friday in lieu of a $50,750 bond.

Pedestrians targeted in armed robberies

New Orleans police are investigating three armed robberies that occurred over a four-hour period Friday night. Around 5:14 p.m. in the 4700 block of Redwood Street, two men approached the victims, ages 14 and 15, demanding their property. The teens complied, according to NOPD's major offense report. Three hours later, two suspects in a vehicle approached a man in the 3700 block of Baronne Street, seeking cash. The 56-year-old victim gave up his money and the perpetrators fled, according to police reports. The last incident was reported at 8:59 p.m. at Leonidas and Sycamore streets. Two suspects armed with guns demanded property from two women and a man, police said. The suspects took a purse from a 17-year-old woman. Anyone with information is asked to call Crimestoppers at 504.822.1111.

Man wounded in drive-by

A 24-year-old man was wounded in a drive-by shooting on a 7th Ward street Friday night, New Orleans police said. The incident was reported at 8:49 p.m. in the 1800 block of Lapeyrouse Street. The victim said a vehicle pulled up and fired on him. He was struck in the leg and taken to a hospital by car, police said. On Saturday morning, police would return to the neighborhood after a man was found shot to death in the 1500 block of North Roman Street. Anyone with information should call Crimestoppers at 504.822.1111.

Teen accused of shooting up porch in Kenner

A teenager Friday shot up just about everything on a Kenner man's porch except for his intended victim. Bullets struck the porch, the handrail, the garbage can and even the phone that the victim was holding, police said. The assault unfolded about noon in the 400 block of Warren Street. Police said a 75-year-old man was sitting on his porch when Darren "D-Whiz" Thomas, 18, Apt. C, 850 Rev. Richard Wilson Drive, Kenner, began shooting at him. Thomas fled but was eventually found about a half mile away in the 400 block of Farrar Avenue and arrested. The victim and other witnesses identified him as the gunman, police said. They booked him with attempted second-degree murder. The gun was not found, but police said Thomas' hand tested positive for gunshot residue. They were still investigating the motive for the shooting.

Second suspect booked in Avondale burglary

The second suspect in an Avondale home burglary was identified Friday by the Jefferson Parish Sheriff's Office. Deputies are seeking Michael Smith, 35, 145 Nicole Blvd., Avondale. A Sheriff's Office spokesman said detective Steve Heggerson matched a photo of Smith to a man who had been seen leaving a Marrero pawn shop after selling property stolen in the burglary. Heggerson made the connection after the Sheriff's Office distributed an image from the pawn shop's surveillance camera, which generated tips from the public. The first suspect was previously identified as Jameson Wood, 3[illegible]. Both are at large, and anyone with information on their whereabouts was asked to call Heggerson at 504.364.5300 or Crimestoppers Inc. at 504.822.1111.

Suspect nabbed blocks from store robbery

After a Kenner jewelry store was robbed Wednesday afternoon, police chased down a suspect and arrested him four blocks away. They booked Tajan McGee, 21, of Apt. A, 1717 42nd St., Kenner, with simple robbery and resisting an officer. The robbery was reported at 4:55 p.m. at Raymonds Jewelers, 4103 Williams Blvd. Police said a customer was looking at a fleur-de-lis pendant behind the counter when he jumped onto the counter, snatched the piece and ran out. Police said they found McGee running in the 3700 block of 42nd Street, chased him and arrested him.

Plaquemines drive-by strikes home, vehicle

Plaquemines Parish Sheriff's Office is investigating an early morning drive-by shooting in the 400 block of Walker Road at Belle Chasse. At least two bullets were fired into a home, and a vehicle was struck, police said. No one was injured in the shooting. It is the second drive-by shooting incident in a week in the parish. On Wednesday, an 18-year-old Buras man was booked on charges related to a drive-by shooting in Boothville that left no injuries, according to Plaquemines Sheriff Lonnie Greco. Police ask anyone with information to call Crimestoppers at 504.822.1111.

— From staff reports

Algiers street improvements officially start

Project designed for greater safety

From staff reports

Improvements to Gen. de Gaulle Drive and Newton Street are just the beginning of a plan to rehabilitate Algiers roads, officials said Thursday.

Elected officials, business leaders and residents cut the ribbon on the $3 million Paths to Progress project designed to make streets safer and add sidewalks, ramps and landscaping.

About $15 million has been spent on Algiers streets in the past two to three years. Another $90 million is being spent on Gen. de Gaulle to address chronic flooding on the community's main evacuation route, said state Sen. David Heitmeier, D-Algiers.

More construction is coming. Work will begin on MacArthur Boulevard and Sullen Street in the next few months, Heitmeier said, and efforts are underway to find money to fix Old Behrman Highway. Repairs also are planned for Somerset, Berkley and Huntlee, said Mark Jernigan, New Orleans' public works director.

"This is the beginning, far from the end," Heitmeier said. "When you're able to not have to bring your car in and get it aligned every week, it makes a difference. The streets are something that government can do."

State Rep. Jeff Arnold, D-Algiers, said the investment in infrastructure is paying off. He pointed to the newly expanded Algiers Plaza on Gen. de Gaulle and two new buildings under construction on a long-vacant tract on Gen. de Gaulle near Life Center Drive.

"It's not a coincidence that you're see economic development starting to bloom," Arnold said. "The improvements coming on Gen. de Gaulle are sparring and giving confidence to those developers to reinvest in those properties."

The Paths to Progress program is a $90 million initiative to rehabilitate 60 street segments in New Orleans and Jefferson Parish. It is sponsored by the state Department of Transportation and Development, Federal Highway Administration, Regional Planning Commission and New Orleans.

Heitmeier thanked state Transportation Secretary Sherri LeBas, Arnold and Regional Planning Commission Executive Director Walter Brooks for helping secure funding. "When you're dealing with limited resources and how to make things happen, it's real easy to say we can't do something," Heitmeier said. "Secretary LeBas figures out how we can do it. She has a can-do attitude."

In the past five years, almost $1.2 billion has been spent on infrastructure in Jefferson and Orleans, LeBas said. "The Paths to Progress is a testament of our continued commitment to this area," she said.

Gretna considers garage sale limits

Officials want them on weekends only

By Andrea Shaw
Staff writer

Complaints about garage sales lasting several days in residential neighborhoods have prompted Gretna officials to consider restricting the sales to Saturdays and Sundays.

A measure on the City Council agenda next week would limit yard sales, rummage sales and estate sales to those days from 8 a.m. until 5 p.m.

Councilman Wayne Rau said some residents called code enforcement to complain about neighbors who hold garage sales five or six days a week, which disrupt their quality of life. "We're trying to set some limits. We're trying to tighten and clean up the ordinance," he said.

Residents must still apply and pay a $25 fee for a permit, and only two permits are issued within a 12-month period, "per piece of residentially zoned property." They must be displayed prominently during set-up and the event.

The proposed amendment also prohibits items from being purchased for the purpose of resale and bans garage sale signs from public property, including utility poles.

Violation of the ordinance carries up to 60 days in jail and a $500 fine. The council meets Dec. 10 at 5:30 p.m. at City Hall, Huey P. Long Avenue and Second Street.

• • • • • • •

Andrea Shaw can be reached at ashaw@nola.com or 504.826.3780.

Plans for pharmacy on Magazine Street met with mixed reactions

Sale of alcohol opposed by some

By Richard A. Webster
Staff writer

Plans to turn a vacant store space that once housed a Blockbuster Video on Magazine Street into a CVS pharmacy have been met with opposition from nearby residents, the Uptown Messenger reports.

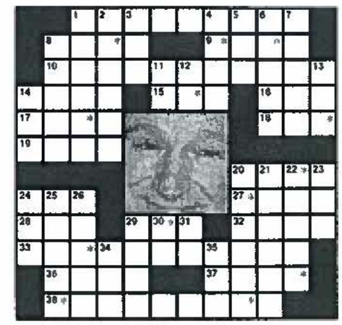
"The corner building at Louisiana Avenue and Magazine Street has sat largely vacant since the recent wave of Blockbuster Video closings, though the Subway sandwich shop and Green Tea Chinese Restaurant remain open on the Louisiana Avenue side of the building," according to the story. "Now, CVS hopes to buy the building, renovate it completely, and use the entire space for a pharmacy, said land-use attorney Michael Sherman in a meeting with neighbors Tuesday evening."

Residents say they oppose the opening of another drug store in the neighborhood because there is already a Walgreens located a few blocks away. But their main objection is to CVS's plan to sell alcohol.

"Sherman said the store would not sell any alcohol as singles for individual consumption, but neighbors said that the Walgreens down the street has thrived despite an agreement not to sell alcohol," the story reports. "If the CVS receives permission to sell alcohol, they said, the Walgreens will likely feel compelled to follow suit."

The City Planning Commission and the City Council must approve the proposal though no hearings have been scheduled

THE TV CROSSWORD



The identity of the featured performer is found within the answers in the puzzle. To take the TV Challenge, unscramble the letters in [illegible] with asterisks within the puzzle.

ACROSS
1. Role on "Person of Interest" (2)
6. Tender to the touch
9. "___ ___ out?"; [illegible] question to a dog standing in the doorway
10. "Last ___ ___"
14. Dog in "Peter Pan"
15. Beast of burden
16. Actress on "Elementary"
17. [illegible] Sean Connery, for short
18. Power or McCain: abbr.
19. To ___ ___; exactly
20. Ms. Mazar
24. Jolson and McNeeley
27. Mr. Jones
28. Pres. Arthur's monogram
29. Actress Perabaker
32. Job opening
33. Actress on "Grey's Anatomy" (2)
36. [illegible]
37. Disease [illegible]
38. [illegible]

DOWN
1. Role on "Happy Days"
2. [illegible]
3. "___ Just Not That Into You"; 2009 movie
4. [illegible]
5. "This Is the ___"; 2013 James Franco film
6. Deities
7. One of the Muppets
8. "Oh! ___"
11. Casual farewell
12. "___ the World Turns"
13. "[illegible] ___"; [illegible] film
14. Org. for Bucks and Bulls
20. Banish, as a feeling or idea
21. "___ Queen" [illegible]
22. "The Brothers ___"; 2006 [illegible]
23. [illegible]
24. "___ Ventura: Pet Detective"; Jim Carrey movie
25. [illegible]
26. Actor [illegible] ___
27. [illegible]
30. [illegible]
31. [illegible]
34. Letter from Greece
35. Store supervisor: abbr.

Solution

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Hidato Sol.

12/7

		103	105	106	36	38	40	41	42		
		102	104	107	35	37	39	43	54		
100	101	97	108	109	110	34	44	45	55	53	52
99	98	96	112	111	33	32	31	46	56	49	51
123	121	120	95	113	114	30	2	57	47	48	50
122	124	119	94	115	29	28	3	1	58	59	60
125	127	93	118	117	116	24	27	4	5	6	61
126	128	129	92	22	23	25	26	13	7	64	62
88	90	91	130	21	20	16	14	12	8	65	63
89	87	134	133	131	19	17	15	11	9	68	66
84	85	86	132	79	78	18	75	10	69	70	67
	83	82	81	80	77	76	74	73	72	71	

The New York Times
620 8TH AVENUE • NEW YORK, NY 10018

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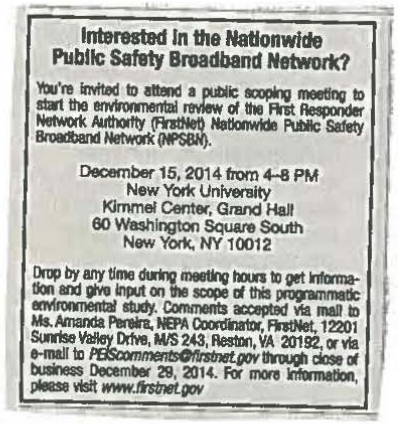

5407-FEB 05

CERTIFICATION OF PUBLICATION

DEC 16 2014 20____

I, Alice Weber, in my capacity as a Principal Clerk of the Publisher of The New York Times a daily newspaper of general circulation printed and published in the City, County and State of New York, hereby certify that the advertisement annexed hereto was published in the editions of The New York Times on the following date or dates, to wit on

DEC 14 2014 20____

Alice Weber

Approved:

Maria Pannullo

THIS CERTIFICATION NOT VALID WITHOUT NYT RAISED SEAL

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Appendix C: Scoping Meeting Posters and Handouts

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Programmatic Environmental Impact Statement

What are the Project Alternatives?

Mixed Technologies Alternative:

FirstNet intends to construct a long-term evolution (LTE) nationwide public safety broadband network (NPSBN) using a combination of the following methods:

- Collocation of the network equipment on existing towers, poles and structures, some of which would require structural hardening or reinforcement to improve disaster resistance and resiliency;
- Construction of new communication towers, poles and associated structures to include generators, equipment sheds, fencing, and concrete pads;
- Collocation on existing fiber facilities, including lighting dark fiber and installation of new fiber on existing poles and in existing conduit;
- Installation of new conduit and fiber using trenching (including vibratory plowing) or directional boring (including horizontal directional drilling);
- Deployment of satellite phones and other portable satellite technology;
- Installation of microwave facilities for cell-site backhaul communication; and
- Utilization of deployable technologies to reach rural and remote areas. Deployable technologies encompass a range of items, generally characterized as the following:
  - Cell on Wheels (COW): a cellular base station on a trailer with an expandable antenna mast and usually a microwave or satellite link back to the main controller;
  - Cell on Light Truck (COLT): a cellular base station on a light truck platform with an expandable antenna mast and usually a microwave or satellite link back to the main controller;
  - System on Wheels (SOW): a full base station and controller on a trailer/truck/big rig/etc. A SOW is a fully self-contained cellular system that can provide an island system with no need for satellite/microwave link back; applicability of this type of deployable technology may be limited if there is no internet connectivity; and,
  - Deployable Aerial Communications Architecture: Aerial vehicles, including, but not limited to, drones, weather balloons, and blimps, which would be deployed at high altitudes and are capable of providing wide-area coverage, although with relatively low capacity/throughput.

Deployable Technologies Only Alternative:

Procure, deploy, and maintain a nationwide fleet of mobile communications systems to provide temporary coverage in areas not covered by existing, usable infrastructure, as there would be no collocation of equipment or new construction. Generally, these units would be deployed at times of an incident to the affected area. These mobile communication units would be temporarily installed and may use existing satellite, microwave, or radio systems for backhaul.

No Action Alternative:

Under the No Action Alternative, the Nationwide Public Safety Broadband Network (NPSBN) would not be constructed; there would be no nationwide, coordinated system dedicated to public safety interoperable communications. The existing multiplicity of communications networks would remain in place, as would the current, known limitations and problems of existing communication networks during times of emergency or disaster. This alternative would require an act of Congress to revise the Act, which currently requires the NPSBN.

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Programmatic Environmental Impact Statement

Description of the Project Area

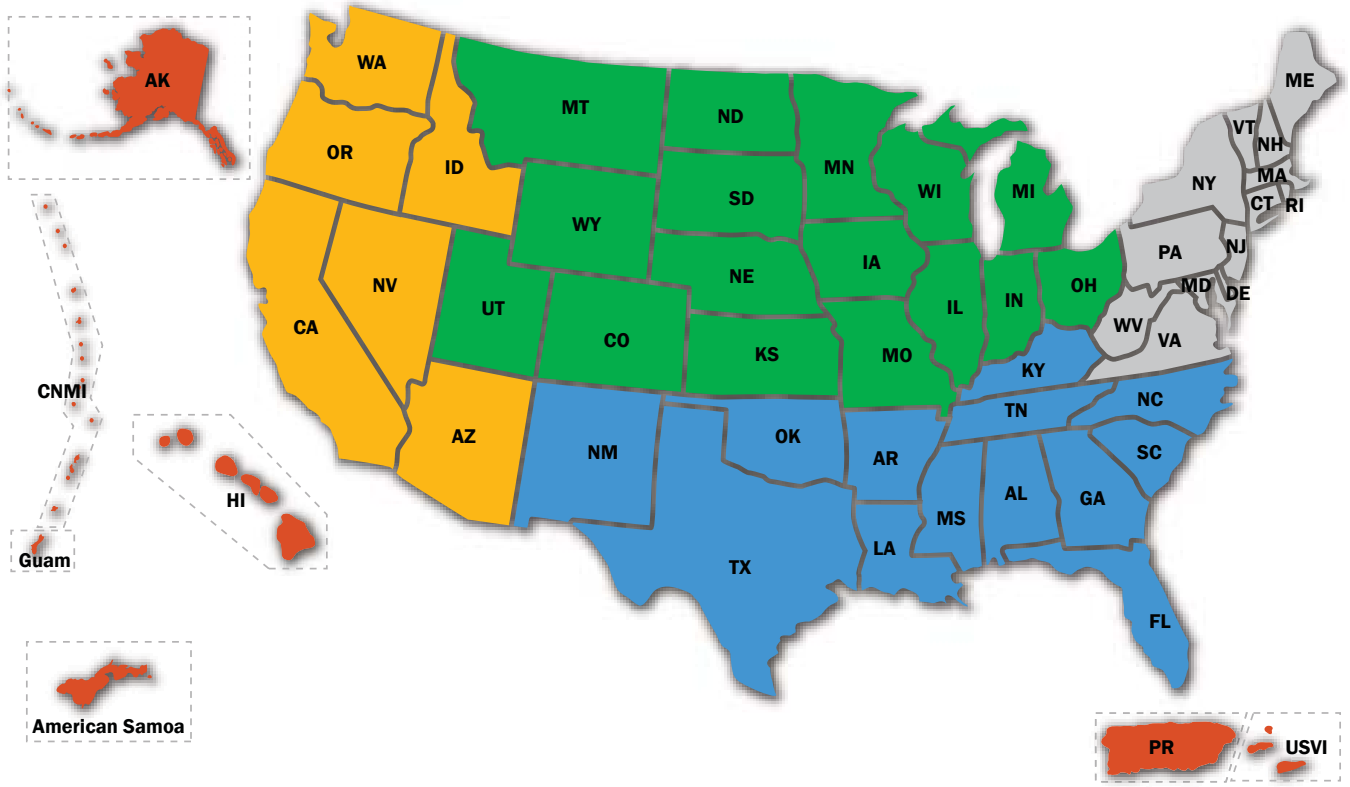
The FirstNet Programmatic Environmental Impact Statement project area would cover the geography of 50 states, 5 territories, the District of Columbia, and 566 tribal nations. Over the past 30 years, wireless operators have invested tens of billions of dollars in terrestrial networks covering over 60% of the U.S. land mass. The Nationwide Public Safety Broadband Network (NPSBN) is intended to provide nationwide service, including substantial rural milestones as part of each phase of the construction and deployment of the network.

FirstNet has determined that the design, construction, and operation of the NPSBN is a broad action with nationwide implications. This approach provides for the broadest and most extensive analysis in order to support the balancing of different considerations, including social, economic, and environmental issues. The programmatic approach creates a comprehensive analytical framework that assesses impacts expected from the NPSBN as a whole. It also supports any subsequent site-specific environmental analyses that may be required for individual actions at specific locations, once they are identified.

The programmatic approach allows FirstNet to identify and define three categories of actions: those types of actions that would not have a significant impact on the environment; those actions that would not have a significant impact if certain mitigation measures or best management practices are implemented; and those actions that will require site-specific analysis to determine the nature and extent of impacts.

The project area is divided into five regions:

- **East** – comprised of FEMA regions 1, 2, and 3 (with the exception of PR and USVI)
- **Central** – comprised of FEMA regions 5, 7, and 8
- **South** – comprised of FEMA regions 4 and 6
- **West** – comprised of FEMA regions 9 and 10 (except for AK and the Pacific Islands)
- **Non-Contiguous** – comprised of AK, HI, PR, USVI, CNMI, AS, and Guam



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Programmatic Environmental Impact Statement

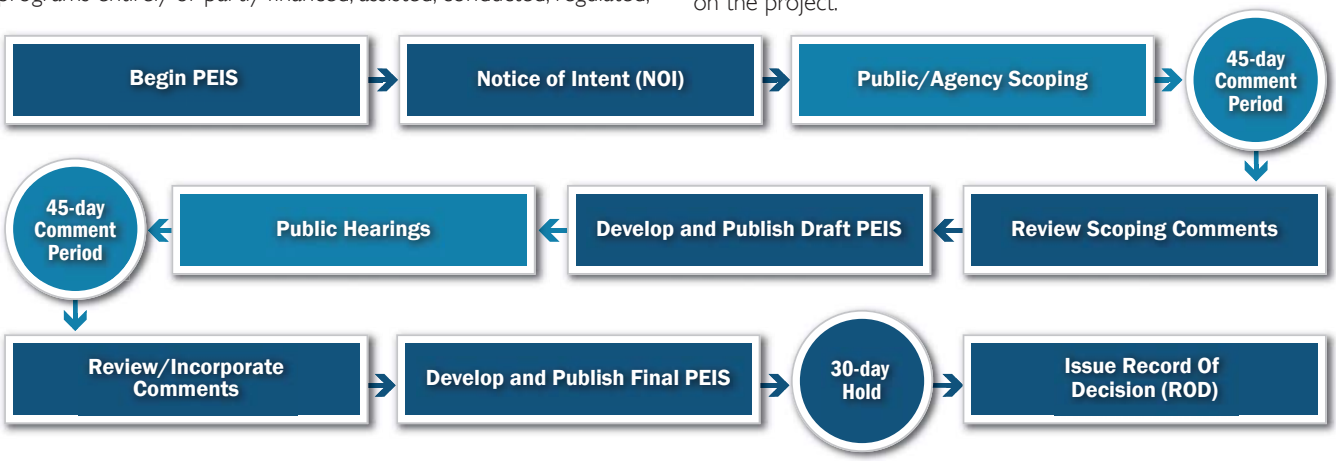
NEPA Process

The National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.) provides a framework to evaluate the impact of major federal actions on the environment and allows the public the opportunity to provide input on implementation alternatives. NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. NEPA also established the Council on Environmental Quality (CEQ). As part of the Executive Office of the President, CEQ coordinates federal environmental efforts and is responsible for advising the President on environmental policy matters. CEQ has also promulgated regulations implementing NEPA which are binding for all federal agencies. These regulations address the procedural provisions of NEPA and the administration of the NEPA process, including preparation of Environmental Impact Statements (EIS).

NEPA is applicable to all "major" federal actions affecting the quality of the human environment. A major federal action is an action with effects that may be major and which are potentially subject to federal control and responsibility. These actions may include new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies; new or revised agency rules, regulations, plans, policies, or procedures; and legislative proposals. FirstNet has determined the construction, operation, and maintenance of the Nationwide Public Safety Broadband Network (NPSBN) qualifies as a major federal activity under these criteria and triggers a NEPA review.

Because of this, FirstNet is required to comply with NEPA, which requires that the government examine the environmental, social, historic, and cultural impacts of its proposed actions before it irretrievably commits resources to undertake them. Furthermore, FirstNet must comply with its own NEPA implementing procedures, which were finalized and published in the Federal Register on April 29, 2014. On November 12, 2014, FirstNet published a Notice of Intent (NOI) to prepare five coordinated Programmatic Environmental Impact Statements (PEIS) in the Federal Register. The PEISs will analyze the direct, indirect, and cumulative impacts of the alternative approaches to the construction, operation, and maintenance of the NPSBN on natural, cultural, and social resources.

The NEPA process is depicted in the diagram below. The light blue coloring indicates those opportunities for the public to comment on the project.



The PEIS process started with publication of the Notice of Intent in the Federal Register on November 12, 2014. The scoping/public comment period for this PEIS will end on December 29, 2014.

Currently, the PEIS is at the scoping phase. During the scoping phase, a wide range of partners including the public, interest groups, and agencies at all levels of government are encouraged to provide input about the project. The PEIS will incorporate and build upon the prior planning efforts, environmental studies, and public input.

All of the collected information will form the basis for a range of alternatives to implement the project and eventually the selection of a preferred alternative.

The preferred alternative will be identified in the Draft PEIS when it is made available to the public for review and comment. A 45-day public comment period with public hearings similar to the scoping meetings will be held. The Final PEIS will incorporate comments received on the Draft PEIS. After publication of the Final PEIS, FirstNet will make the decision regarding the selection of an alternative within a Record of Decision.

FirstNet
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Programmatic Environmental Impact Statement

Public Involvement

The National Environmental Policy Act (NEPA) regulations require that a lead agency preparing an Environmental Impact Statement (EIS) is to involve the public, along with government agencies, American Indian tribes, private-sector organizations, and other interested parties in scoping (40 CFR 1501.7).

The public scoping process for the FirstNet Programmatic EIS (PEIS) began with publication of the Notice of Intent in the Federal Register on November 12, 2014. Scoping is the first phase of the NEPA analysis process and gives interested parties the chance to comment on the proposed action and to offer suggestions about the issues to be considered in the EIS analyses. Interested government agencies, American Indian tribes, private-sector organizations, and the general public are encouraged to participate in this scoping process. The scoping period will last for 45 days, ending on December 29, 2014. Written comments can be submitted either electronically or by paper copy. Information and public comments received during the Scoping Period will be reviewed for consideration in the development of each regional Draft PEIS.

To receive updates and announcements regarding the project and public involvement opportunities on this project, email ***PEIScomments@firstnet.gov***.

Public Scoping Comment Period: November 12 to December 29, 2014

Scoping Meetings

FirstNet is holding scoping meetings in the following locations to obtain comments from the public:

- Tuesday, November 25: Washington DC, 4 – 8 p.m., EST
- Tuesday, December 2: Honolulu, HI, 4 – 8 p.m., HST
- Thursday, December 4: San Francisco, CA, 4 – 8 p.m., PST
- Thursday, December 4: Tucson, AZ, 4 – 8 p.m., MST
- Tuesday, December 9: Kansas City, MO, 4 – 8 p.m., CST
- Thursday, December 11: New Orleans, LA, 5 – 9 p.m., CST
- Monday, December 15: New York, NY, 4 – 8 p.m., EST

Each scoping meeting will provide an opportunity for the public to speak with subject matter experts and FirstNet staff. The scoping meetings are an open format, allowing the public to drop in at their convenience throughout the evening. Comments can be provided to FirstNet staff with a note taker present to transcribe their comments. In addition, attendees can provide their comments in writing at the meeting.

Submitting Comments

The public is invited to submit written comments for consideration during scoping. Written comments may be submitted electronically via email to ***PEIScomments@firstnet.gov***, in person using the comment forms provided at this scoping meeting, or by mail to:

Amanda Pereira, NEPA Coordinator
FirstNet
12201 Sunrise Valley Drive, M/S 243
Reston, VA 20192

Comments received will be made a part of the public record and may be posted to the FirstNet website without change. Comments should be machine readable and should not be copy-protected. All personally identifiable information (e.g., name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

How Are Scoping Comments Used?

Scoping for the Draft PEIS will provide several key elements to assist in the preparation of the document:

1. Gathering information and ideas from the public and key stakeholder groups, such as the public safety community, about the analytical issues related to the Nationwide Public Safety Broadband Network;
2. Making determinations about which issues should be analyzed; and
3. Identifying alternatives to the proposed action that should be considered for analysis.

The scoping process is ongoing and critical to informing federal agency actions, in that it begins before the PEIS analyses are initiated and continues throughout document development of the PEIS.

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Programmatic Environmental Impact Statement

What is the Proposed Action?

The purpose of the proposed action is to develop a nationwide, interoperable, public safety broadband network (NPSBN). The goal of FirstNet is to provide dedicated services that are comparable to or better than those services public safety has access to today through commercial broadband wireless carriers. These applications and services are intended to enhance the ability of the public safety community to perform more reliably, effectively and safely. FirstNet's goal is that the NPSBN would also provide a backbone to allow for improved communications by carrying high-speed data, location information, images, and, eventually, streaming video. This capability is intended to increase situational awareness during an emergency and improve the ability of the public safety community to effectively engage in those critical activities.

Description of the Proposed Action

The Proposed Action would encompass the design, construction, and operation of the NPSBN by FirstNet or a partner organization(s). By statute, the network must have several characteristics, including security, resiliency, backwards compatibility with existing commercial networks, integration with public safety access point (PSAPs) or their equivalents, substantial rural coverage, it must be built to open, non-proprietary, commercially available standards, and it must use existing infrastructure to the maximum extent economically desirable.

FirstNet intends to construct a core network, comprised of all standard Evolved Packet Core elements under the 3rd Generation Partnership Project (3GPP) standards (including the Serving and Packet Data Network Gateways, Mobility Management Entity, and the Policy and Charging Rules Function), device services, location services, billing functions, and all other network elements and functions other than the Radio Access Network (RAN). FirstNet expects to construct RAN networks that would consist of all cell site equipment, antennas, and backhaul equipment and services required to enable wireless communications with devices using the public safety broadband spectrum. In addition, FirstNet must continue to maintain and improve the NPSBN to account for new and evolving technologies.

The Promise of FirstNet

WHAT IS THE FIRST RESPONDER NETWORK AUTHORITY (FIRSTNET)?

FirstNet is an independent authority within the U.S. Department of Commerce's National Telecommunications and Information Administration. FirstNet is governed by a 15-member Board consisting of the Attorney General of the United States, the Secretary of Homeland Security, the Director of the Office of Management and Budget, and 12 members appointed by the Secretary of Commerce. The FirstNet Board is composed of representatives from public safety; local, state and federal government; and the wireless industry.

Signed into law on February 22, 2012, the Middle Class Tax Relief and Job Creation Act created FirstNet. The law gives FirstNet the duty to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety entities. FirstNet will provide a single interoperable platform for public safety communications.

WHAT WILL BE POSSIBLE WITH THE FIRSTNET NETWORK?

The FirstNet network will improve citizen and responder safety and increase the efficiency and effectiveness of emergency response through cutting edge broadband communications. Imagine a day when a single communications network can be used to dispatch EMS personnel, a medical helicopter, police officers, and fire personnel from different jurisdictions all at the same time, utilizing voice, video, and data at broadband speeds.

Public safety personnel using the FirstNet network will be able to share applications, access databases, and provide better informed responses to incidents through integrated communications.

FirstNet's goal is to provide public safety-grade reliability and nationwide coverage so all public safety personnel can count on the network when they are on the job. FirstNet is also aiming to provide coverage solutions that let public safety "take the network along" to the destination in certain geographies. FirstNet will create a nationwide standard of service while affording localized customization and control.

When the FirstNet network launches, it will provide mission-critical, high-speed data services to supplement the voice capabilities of today's Land Mobile Radio (LMR) networks. Initially, the FirstNet network will be used for sending data, video, images and text. The FirstNet network will also carry location information and eventually support streaming video. FirstNet plans to offer cellular voice communications such as Voice over Long Term Evolution (VoLTE) or other alternatives.

WHY WAS FIRSTNET CREATED?

The public safety community fought hard to fulfill the 9/11 Commission's last standing recommendation and lobbied Congress to pass legislation establishing a dedicated, reliable network for advanced data communications nationwide. During emergencies, public safety personnel need priority access and preemption, which are not available on commercial networks.

HOW WILL THE FIRSTNET NETWORK BENEFIT PUBLIC SAFETY?

Using the FirstNet network will improve situational awareness, decision-making and responder and citizen health and safety. Just as smartphones have changed personal lives, FirstNet devices and applications will ultimately change the way public safety operates. FirstNet devices will work anywhere on the network and will save time when seconds matter. A market of millions of public safety users will bring savings opportunities to state and local budgets. FirstNet will bring the benefits of a single, nationwide, interoperable network that is built to open standards to public safety agencies across the country. With millions of users on a single network, FirstNet can take advantage of increased vendor competition and economies of scale to drive down the final cost to the public safety user.

WHAT WILL USERS PAY FOR FIRSTNET'S SERVICES?

FirstNet intends to offer services at a compelling and competitive cost to attract millions of public safety users and make FirstNet self-sustaining. The use of FirstNet services and applications will be voluntary. The costs for FirstNet services and devices have not yet been set.

HOW WILL STATES AND AGENCIES PARTICIPATE IN THE BUILDOUT OF FIRSTNET?

The law that established FirstNet requires it to consult with regional, state, tribal and local jurisdictions to ensure that the FirstNet network is designed to meet the needs of public safety across the country. State consultation will be a collaborative process, involving key stakeholders and leadership from each state and territory, and will be iterative to allow for enhancements and improvements from the state and territory. FirstNet will work through the designated single officer or governmental body during consultation to gather requirements from key stakeholders for developing its deployment plan. Additional information on state consultation is available at http://firstnet.gov/consultation.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Public Involvement

The public scoping process began with publication of the Notice of Intent in the Federal Register on November 12, 2014. Scoping is the first phase of the NEPA analysis process and gives interested parties the chance to comment on the proposed action and to offer suggestions about the issues to be considered in the EIS analyses. Interested government agencies, American Indian tribes, private-sector organizations, and the general public are encouraged to participate in this scoping process.

The scoping period will last for 45 days, ending on December 29, 2014. Written comments can be submitted either electronically or by paper copy. Information and public comments received during the scoping period will be reviewed for consideration in the development of each regional Draft PEIS.

Submitting Comments

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PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

What is NEPA?

The National Environmental Policy Act of 1969 (NEPA) provides a framework to evaluate the impact of major Federal actions on the environment and through the PEIS process, allows the public the opportunity to provide input on implementation alternatives.

The NEPA process is depicted in the diagram below. The light blue coloring indicates those opportunities for the public to comment on the project.

The PEIS process began with publication of the Notice of Intent in the Federal Register on November 12, 2014. The scoping/public comment period for this PEIS will end on December 29, 2014.

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PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Description of the Project Area

The FirstNet Programmatic Environmental Impact Statement project area would cover the geography of 50 states, 5 territories, the District of Columbia, and 566 Federally recognized tribes. Over the past 30 years, wireless operators have invested tens of billions of dollars in terrestrial networks covering over 60% of the U.S. land mass. The NPSBN is intended to provide nationwide service, and it is intended to include milestones that address wilderness and rural coverage gaps.

The project area is divided into five regions:

- **East** – comprised of FEMA regions 1, 2, and 3 (with the exception of PR and USVI)
- **Central** – comprised of FEMA regions 5, 7, and 8
- **South** – comprised of FEMA regions 4 and 6
- **West** – comprised of FEMA regions 9 and 10 (except for AK and the Pacific Islands)
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PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

What are the Project Alternatives?

Mixed Technologies Alternative:

Potential elements to be considered for the construction of a long-term evolution (LTE) nationwide public safety broadband network (NPSBN):

- Collocation of the network equipment on existing towers, poles and structures;
- Construction of new communication towers, poles and associated structures;
- Collocation on existing fiber facilities;
- Installation of new conduit and fiber using trenching or directional boring;
- Deployment of satellite phones and other portable satellite technology;
- Installation of microwave facilities for cell-site backhaul communication; and
- Utilization of deployable technologies to reach rural and remote areas, such as;
  - Cell on Wheels (COW)
  - Cell on Light Truck (COLT)
  - System on Wheels (SOW)
  - Deployable Aerial Communications Architecture: Aerial vehicles, including, but not limited to, drones, weather balloons, and blimps, which would be deployed at high altitudes and are capable of providing wide-area coverage, although with relatively low capacity/throughput.

Deployable Technologies Alternative:

Procure, deploy, and maintain a nationwide fleet of mobile communications systems to provide temporary coverage in areas not covered by existing, usable infrastructure, for deployment at times of an incident to the affected area. These mobile communication units would be temporarily installed and may use existing satellite, microwave, or radio systems for backhaul.

No Action Alternative:

Under the No Action, the NPSBN would not be constructed; there would be no nationwide, coordinated system dedicated to public safety interoperable communications. This alternative would require an act of Congress to revise the Act, which currently requires the NPSBN.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

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FirstNet's goal is that the NPSBN would also provide a backbone to allow for improved communications by carrying high-speed data, location information, images, and, eventually, streaming video. This capability is intended to increase situational awareness during an emergency and improve the ability of the public safety community to effectively engage in those critical activities.

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FirstNet intends to construct a core network, comprised of all standard Evolved Packet Core elements under the 3rd Generation Partnership Project (3GPP) standards, device and location services, billing functions, and all other network elements other than the Radio Access Network (RAN). FirstNet expects to construct RAN networks that would consist of all cell site equipment, antennas, and backhaul equipment required to enable wireless communications with devices using the public safety broadband spectrum.

Finally, the Act states that FirstNet must continue to maintain and improve the NPSBN to account for new and evolving technologies.

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Appendix D: Attendance Lists
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Appendix E: Comments
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Appendix F: Responses to Scoping Comments

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
11/18/2014	Mail	Ellie L. Irons	Commonwealth of VA - Department of Environmental Quality	RFI	Dear Ms. Pereira: This letter responds to the above Notice of Intent, which appeared in the November 12 Federal Register (Volume 79, Number 218) at pages 67156-67157 (hereinafter cited as "the Notice"). The Department of Environmental Quality ("DEQ") is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act ("NEPA") and responding to appropriate federal officials on behalf of the Commonwealth. DEQ also coordinates Virginia's review of federal consistency determinations and certifications prepared pursuant to the Coastal Zone Management Act ("CZMA") and the Virginia Coastal Zone Management Program ("VCP"). DESCRIPTION OF PROPOSED ACTION According to the Notice, the First Responder Network Authority ("FirstNet") is a unit of the Department of Congress, created by the Middle Class Tax Relief and Job Creation Act of 2012 (Public Law 112-96, codified at Title 47, United States Code sections 1401 et seq.) and authorized to "take all actions necessary to ensure the building, deployment, and operation of an interoperable, nationwide public safety broadband network." The network is intended to "allow police officers, fire fighters, emergency medical service professionals, and other public safety entities to effectively communicate with each other across agencies and jurisdictions." (Notice, page 67157, center column). According to the Notice, FirstNet will prepare five regional Programmatic Environmental Impact Statements (PEISs) and conduct scoping meetings, notice of which will be given in the FirstNet" web site (http://www.firstnet.gov). Following completion of the PEISs, proponents of proposed projects will submit site-specific environmental documentation to determine whether a proposed project warrants a Categorical Exclusion, an Environmental Assessment, or an Environmental Impact Statement. The concept of tiering (see National Environmental Policy Act regulations at Title 40, Code of Federal Regulations, part 1508, section 1508.28) will be employed as FirstNet moves from the five PEISs to regional, basin-wide, or site-specific project considerations (Notice, pages 67156-67157).	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies to comply with all requirements.
11/18/2014	Mail	Ellie L. Irons	Commonwealth of VA - Department of Environmental Quality	Scoping / Request for copies of DPEIS and FPEIS	ENVIRONMENTAL REVIEW UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT: PROJECT SCOPING AND AGENCY INVOLVEMENT While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the NEPA document. Accordingly, we are sharing this response to the Notice, and copies of the Notice itself, with selected state and local Virginia agencies whose responsibilities may affect, or be affected by, the plans and/or projects considered in the PEIS covering the eastern states. These agencies are likely to include the following (note: starred (*) agencies administer one or more of the enforceable policies of the Virginia Coastal Zone Management Plan; see "Federal Consistency ..." heading, next): Department of Environmental Quality: -Office of Environmental Impact Review -Northern Regional Office* -Piedmont Regional Office* -Tidewater Regional Office -Valley Regional Office -Blue Ridge Regional Office -Southwest Regional Office -Division of Air Program Coordination* -Division of Land Protection and Revitalization (formerly Waste Division) Office of Stormwater Management* Department of Conservation and Recreation Department of Health (Division of Water Programs*) Department of Game and Inland Fisheries* Virginia Marine Resources Commission* Department of Historic Resources Department of Forestry Department of Transportation Department of Mines, Minerals, and Energy Virginia State Police Department of Emergency Management. In keeping with our regular practice, we will solicit comments from regional planning district commissions and localities when EISs, EAs, or federal consistency documents (again, see next heading) are prepared for programs or projects, based on their nature and geographic impacts. In order to ensure an effective coordinated review of the PEIS, we will require at least 19 copies of it when it is published. This submission may include at least 3 printed copies and 16 CDs, or at least 3 printed copies and an electronic copy available for download at a web site or ftp site. If the PEIS addresses geographic reach or impacts of the program or projects, then it should include one or more U.S. Geological Survey topographic maps as part of its information. We recommend, as well, that project details unfamiliar to people outside FirstNet be adequately described in the PEIS.	Due to the nationwide scope of our current programmatic analysis and the considerable size of the documents, it may not be possible for FirstNet to provide hard copies of the draft and final documents to all interested parties. However, the documents will be available for download on our website to all interested parties.
11/18/2014	Mail	Ellie L. Irons	Commonwealth of VA - Department of Environmental Quality	Coastal Zone Management Act	FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT Pursuant to the Coastal Zone Management Act of 1972, as amended, and the Federal Consistency Regulations (15 CFR Part 930), federal projects with reasonably foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia Coastal Zone Management Program (VCP). The VCP is comprised of a network of programs administered by several agencies. FirstNet must submit a federal consistency determination (FCD) which analyzes the coastal effects of the project in light of the enforceable policies of the VCP (first enclosure), and provides a commitment to comply with the enforceable policies. In addition, we invite FirstNet's attention to the advisory policies of the VCP (second enclosure). Requirements for the contents of FCDs are found in the Federal Consistency Regulations (15 CFR Part 930, Sub-part D, sections 930.39) and also in DEQ's Federal Consistency Information Package (available online at http://www.deq.virginia.gov/Portals/O/DEQ/EnvironmentalImpactReview/FederalConsistencyManual.7.27.1 1. pdf. The Federal Consistency Information Package defines Virginia's coastal zone, among other things. The Federal Consistency Regulations allow up to 60 days for our review of an FCD (15 CFR Part 930, Sub-part C, section 930.41(b)). The FCD may be submitted as a part of and EIS or separately, as you prefer. We recommend that the FCD for a particular project or plan be submitted with the Final EIS rather than the Draft EIS, in order that it reflect resolution of coastal issues that may arise during the comment period for the Draft EIS. In the event broadband network project proponents should seek FirstNet licensing or permitting for their projects, the Federal Consistency Regulations have slightly different requirements and time frames. Three examples of these differences will suffice here: • The federal consistency document is called a "federal consistency certification" rather than a "federal consistency determination." • Projects or plans subject to federal licensing or permitting must be consistent with the enforceable policies of the VCP; the qualifier "to the maximum extent practicable" applies only to direct federal actions. • The time frame for the state's response is 180 days, with a requirement that the state provide a progress report in 90 days and an explanation of the reason for further delay in the response. The Federal Consistency Regulations address federal licensing and permitting in Sub- part D (sections 930.50 through 930.66).	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies to comply with all requirements.

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11/18/2014	Mail	Ellie L. Irons	Commonwealth of VA - Department of Environmental Quality	Information on existing environment	DATABASE LIST Below is a list of databases that may assist you in the preparation of the NEPA document: • DEQ Online Database: Virginia Environmental Geographic Information Systems Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory www.deq.virginia.gov/ConnectWithDEQNEGIS.aspx • DEQ Virginia Coastal Geospatial and Educational Mapping System (GEMS) Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data http://128.172.160.131/gems2/ • DEQ Permit Expert Helps determine if a DEQ permit is necessary www.deq.virgi nia.gov/permitexpert/ • OHR Data Sharing System Survey records in the OHR inventory www.dhr.virginia.gov/archives/datasharingsys.htm • OCR Natural Heritage Search Produces lists of resources that occur in specific counties, watersheds or physiographic regions www.dcr.virgi nia.gov/naturalheritage/dbsearchtool.shtml • DGIF Fish and Wildlife Information Service Information about Virginia's Wildlife resources http://vafwis.org/fwis/ • Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL www.epa.gov/superfund/sites/cursites/index.htm • EPA RCRAInfo Search Information on hazardous waste facilities www.epa.gov/enviro/facts/rcrainfo/search.html • EPA Envirofacts Database EPA Environmental Information, including EPA-Regulated Facilities and Toxics Release Inventory Reports www.epa.gov/enviro/index.html • EPA NEPAssist Database Facilitates the environmental review process and project planning http: //nepaassisttool.epa.gov/nepassist/entry. aspx If you have questions about the environmental review process and/or the federal consistency review process, please feel free to contact me (telephone (804) 698-4325 or e-mail ellie.irons@deq.virgi nia.gov) or John Fisher of this Office (telephone (804)698-4339 or e-mail john.fisher@deq. virginia.gov). I hope this information is helpful to you. Ellie L. Irons, Program Manager Environmental Impact Review	Thank you for your comment.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/2/2014	Mail	Mark Alling	Commonwealth of VA - Department of Environmental Quality	Water Resources	Dear Ms. Pereira: I have reviewed the Scoping for the above referenced project proposed by the National Telecommunications and Information Administration to prepare five regional Programmatic Environmental Impact Statements and conduct scoping meetings. FirstNet intends to build, deploy and operate an interoperable, nationwide public safety broadband network based on a single national network which will allow police, fire emergency medical and other professionals and entities to effectively communicate with each other across agencies and jurisdictions. PRO comments for this project are as follows: Water: Where building and deployment cross or impact surface and groundwater features, erosion and sediment controls should be properly implemented and maintained throughout all phases of construction. E & S controls and Best Management Practices (BMPs) should be inspected/repaired before and after rain events. Please follow all standards and specifications under the Virginia DCR Erosion & Sediment Controls Handbook (1992, 3rd Edition). DEQ recommends maximizing pervious surface areas and green spaces in the construction design to reduce runoff and the environmental impact associated with urban runoff. Please contact Allison Dunaway at (804) 527-5086 for questions dealing with permitting of construction in and near wetlands. Please contact Emilee Adamson at (804) 527-5072 for questions dealing with construction or industrial stormwater permitting.	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies to comply with all requirements.
12/2/2014	Mail	Mark Alling	Commonwealth of VA - Department of Environmental Quality	Waste	Waste: Hazardous or solid waste materials generated should be tested and removed in accordance with the Virginia Hazardous Waste Management Regulations (9 VAC 20-60) and/or the Virginia Solid Waste Management Regulations (9 VAC 20-80). Please understand that it is the generator's responsibility to determine if a solid waste meets the criteria of a hazardous waste and as a result be managed as such. In addition, asbestos waste, lead waste, or contaminated residues generated must be handled and disposed of in accordance with the VSWMR or VHWMR as applicable. DEQ recommends that pollution prevention principles be implemented to reduce the amount of wastes at the source, such as the re-use and recycling of waste materials. If you have any questions concerning hazardous/solid waste management, please contact Jason Miller at (804)527-5028.	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies to comply with all requirements.
12/2/2014	Mail	Mark Alling	Commonwealth of VA - Department of Environmental Quality	Air	Air: DEQ recommends following all air quality standard and specifications to reduce or avoid the emissions of VOCs, especially during periods of high ozone. Fugitive dust should be kept to a minimum, (9 VAC 5-40-5630 et seq). Permits may be required for any boilers or fuel-burning equipment. For further questions, please contact James Kyle at (804) 527-5047. Sincerely, Mark S. Alling Water Monitoring and Planning Manager	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies to comply with all requirements.
12/11/2014	Meeting (New Orleans)	Catherine Cargo	Orleans Parish Communications District (OPCD)	FirstNet outreach	Work on outreach to NENA APCO and their local chapters.	FirstNet will continue to provide information regarding the NEPA process to our stakeholders and provide opportunities for all interested parties to provide input during the release of the draft and final PEISs.
12/11/2014	Mail and Email	Ronald P. Spark, M.D.	Public	Biological Resources	Ms. Pereira: For over a decade I've been one of the hundreds of Tucsonans who dally walk Tucson's Tumamoc Hill. Sited in the midst of Downtown, this volcanic outcropping and Sonoran desert respite affords both the layman and the scientist the engagement and delight in a more than 100 years of reclaimed natural setting. In particular, I'm continually amazed when observing the broadly diverse and robust desert plants and animal species.	Thank you for your comment.
12/11/2014	Mail and Email	Ronald P. Spark, M.D.	Public	Cultural / Historic resources	Its built structures are of a recognized historic character and the trencheras and rock art recall the place as being sacred to the indigenous and extent peoples.	Thank you for your comment.
12/11/2014	Mail and Email	Ronald P. Spark, M.D.	Public	Aesthetics / Recreational Use	As a physician, I am touched by seeing some walkers using canes, braces and, even oxygen, to ascend and absorb the meaningfulness of the Hill. The place has an innate inspiring character. I trust the National Wifi Network will ensure the Public Safety but we must not allow any footprint to lessen the intrinsic public, scientific and cultural value of Tumamoc Hill. Sincerely yours, Ronald P. Spark, M.D. Past-President, Pima County Medical Society Clinical Associate Professor, University of Arizona College of Medicine	Thank you for your comment.

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12/15/2014	Email	Michael Rosenzweig	University of Arizona	NOI	Dear Ms. Pereira, Please accept the attached pdf file as my comment on the proposed Firstnet system in Pima County, Arizona. BTW I met with four Firstnet people in Tucson at the scoping meeting. They brought professionalism and interest to it. I thought they included their contact information in the material they gave me, but I could not find it when I returned home. The first name of the leader was Genevieve and I would like very much to get in touch and thank her. Sincerely, Mike Michael I. Rosenzweig Director Tumamoc: People & Habitats Professor University of Arizona	Thank you for your comment.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	Because of its location in the heart of Tucson, and its prominent elevation and many straight-line radio access paths to the city, this US National Historic Landmark was selected as one of the sites for a transmission tower in the Pima County system to insure interoperability among first responders. The tower is now working as legs for numerous antennae. But its construction was an historic mistake because it greatly erodes the integrity of the NHL. As it seems likely that FirstNet's new technology will collocate by default on the Tumamoc tower, I believe FirstNet needs to learn about the NHL so that its decisions will be fully informed and not directed to such a default position for lack of background data. I add that the County of Pima & The University of Arizona agreed that as new technology was needed to replace the old on Tumamoc, the new would be deployed elsewhere and the old removed from Tumamoc Hill.	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies to comply with all requirements.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	Ownership The Landmark has four major ownership divisions: • 350 acres of fee simple land; owner, U of A • 200 acres from the original U of A land grant • 300 acres open space; owner, Pima County • 20 acres of former landfill; owner, City of Tucson (capped with an ecologically sound, evapotranspirative layer of soil that makes it available for experiments)	Thank you for your comment.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Biological Resources	Ecology Founded as The Carnegie Desert Botanical Laboratory in 1903, it instantly became a leader in ecological research. In 1975, the US Department of the Interior designated part of it and some of its structures a US National Historical Landmark. In 1981, the State of Arizona designated the Hill an "Environmental Research Natural Area." Most of what the world knows about the physiology and ecology of Arizona's iconic saguaro cactus comes from research that began on Tumamoc Hill in 1903 and continues to this very day. In 1985, University and USGS investigators were finally able to establish the nature of the sporadic reproduction of saguaros — it had taken us 80 years! More recently, the Hill hosted the discovery that the isotope ratios of saguaro cactus spines allow us to measure, for the first time, the climate of the Sonoran Desert during the past two centuries. And in 2014, one of its saguaros provided a tissue sample that resulted in the first genome description of any cactus species in the world. Tumamoc Hill is the site of nine plant ecology study quadrats that date from 1906 and are the world's oldest permanent ecology study plots. From 2010-2012, all quadrats were resurveyed with modern optical and digital tools, given GPS coordinates and recensused. All the data of the previous century-plus were digitized, filed with the National Park Service and made publicly available via the Ecological Society of America. Beginning in 1982, long transects were established to record and understand the ecology of more than 100 species of annuals (wildflowers). We now have an unbroken and growing record of 33 generations, capable of detecting subtle variations in environmental conditions such as water regime and weather.	Thank you for your comment.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	Conservation In 1987, the Interior Dept added the remainder of the 680-acre scientific reservation to the landmark in recognition of the Hill's importance to conservation. In 1906, it banished its active stone quarries and excluded domestic grazers and browsers with a 5(+) mile-long fence in order to allow the desert to return to a natural state. Thus was established the world's first restoration ecology project. It is the Hill's conservation status, one of national and international historical significance, whose integrity is severely damaged by the tower.	Thank you for your comment.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	Archaeology For nearly half a century, research on Tumamoc Hill has produced archaeological knowledge about the people who farmed in Tucson starting thousands of years ago. Archaeological remains on the Hill include massive, 2300-yr old trincheras (encircling walls and terraces), more than 150 structures, an array of almost 1000 petroglyphs, and an elaborate prehistoric trail system. The Hill was the site of three successive hilltop settlements with masonry architecture. Very recent work with the isotopes in potsherds shows that, for two millennia or more, Native Americans have been gathering together on the Hill from all around the Tucson basin. In 2010, the US Department of the Interior designated the land and its remains, The Tumamoc Hill Archaeological District of the United States of America. The present communications tower and its associated structures sit on the mesa top where much of the most charismatic ruins are located. Archaeologists must quickly rebury any new excavation to protect it. Any hope of creating an educational experience for visitors is thwarted.	Thank you for your comment.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	Significance to Native American Cultures Tumamoc Hill is a centerpiece of the history of the ancestors of Arizona's O'odham, including the Tohono O'odham Nation, the Ak Chin Indian Community, the Gila River Indian Community, and the Salt River (Pima-Maricopa) Indian Community. The Hill is sacred to all of them. The same is true of the Hopi Nation, and the Pasqua Yaqui, too. Both the University of Arizona and Pima County respect the sensitivity and traditions of native people regarding Tumamoc Hill. The university and the Nations agreed in writing that the footprint of western culture on the Hill would not be increased. When their permission was sought by the county to erect the current tower, they consented only because they were told it was necessary to save lives. Absent that consideration, they would surely prefer to see the tower removed.	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.

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12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Aesthetics / Recreational Use	Walking the Hill Each week, thousands of people wend their way along the Tumamoc Hill Road, ascending 800 feet to its mesa top. Without promotion or marketing, "Walking the Hill" has become a Tucson institution woven into the fabric of the community, uniting people from every socio-economic group within our region. The Hill hosts approximately 300,000 to 500,000 walking trips per year. For many, their Tumamoc walk has become a daily ritual. Recently the University of Arizona College of Medicine has begun work on a research project focused on the walkers. It studies the effects of the green desert environment in the midst of an urban heat island on the allostatic load of stress, well-being and spirituality. Meanwhile, despite the crowds, the Hill has no security apparatus or personnel. Instead it relies on the honor and sound judgment of walkers to stay off the mesa top itself. But the need for good security for the FirstNet system would seem to promise tension between the need for reliable interoperability and the demand for liberal public use. Put simply, if FirstNet's needs interfere with easy access to Tumamoc by walkers, the result will be a sustained gnashing of teeth.	Thank you for your comment.
12/15/2014	Email Attachment	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	SUMMARY OF IMPACTS Use of the mesa top of Tumamoc Hill for a communication tower to support interoperability in Pima County will have the following negative impacts. • It will establish, far into the future, a communication superstructure that amounts to a serious cultural, environmental and historical mistake. • It will erode the integrity of a National Historic Landmark. • It will prevent important archaeological resources from being made available to educate the public. • Either it will risk a clash between public use of the Hill for recreation, or else it will occupy an area without security. • It will frustrate the desire of six Native American nations to reduce the presence of unwelcome technical apparatus on a Hill invested with deep religious significance. Michael Rosenzweig 15 December 2014	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.

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12/15/2014	Email	Paul Dayton	University of California San Diego	Cultural / Historic resources	Dear Friends, this note relates to the importance of including Tumamoc Hill, in Tucson, Arizona, in FirstNet. I write to support the inclusion of this facility. As you know it has several historic buildings but its most important ongoing legacy is the science.	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/15/2014	Email	Paul Dayton	University of California San Diego	Biological Resources	It very much is the home of the science of desert ecology starting over 100 years ago with Carnegie support. Over the century some of the best desert ecologists in the world spent their careers there developing a unique understanding of the evolution of a desert ecosystem over the last 100 thousand years. In recent time they established unique baseline data on desert plants that span most of the century. They organization is unique and the facility priceless. I hope you can help protect it with FirstNet. Sincerely Paul Dayton	Thank you for your comment.
12/16/2014	Email	Rich Watson	Public	Cultural / Historic resources	I recently heard about the future involvement of First Net on Tumamoc Hill and am encouraged that the Federal Government is concerned about secure communications. However, on a more personal level, I am concerned about maintaining the integrity of this unique and irreplaceable historical and scientific resource. Unique, in part, because it has been guarded, researched and protected by the University of Arizona and many others for over a century. In ancient times, this was home to native people long before Europeans imagined our existence and a strong remnant of those people is still intact on the property. In addition, severe encroachment by recreational users (welcomed with sensitivity), the City of Tucson and high traffic on the perimeter causes substantial risk to this delicate property. Prior to construction of the new towers on Tumamoc, I was personally involved in discussions relating to use, impact and future maintenance. When bonds are passed, funding is available and agreement reached between multiple agencies and jurisdictions it is easy to make well intended promises. Such promises were made prior to the tower development with good intentions. History dictates that memories become short and promises are forgotten over time. In this particular case, it is my sincere hope that you take seriously your new responsibility as a joint caretaker of the history, management and protection of Tumamoc. Once damaged or destroyed, it can never be restored. Consequently, it is imperative that all who are caretakers never lose vigilance as we move into the future. Please respect the ancient people, the century of scientific study and Dr.Michael Rosensweig, who is a highly qualified and deeply invested steward of this property. Rich Watson	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/16/2014	Email	Russell P. Long, CRB, CLHS	Long Realty Company	Cultural / Historic resources	To Whom It May Concern, Tumamoc Hill has been a fixture in our family since the very early 1900's when our great grandfather, Burton Bovee, began working there. Long before we every visited there and as children our mother told us tales of Burton working there, riding his horse and mule all over the Tucson basin collecting samples and specimens. As adults we became aware of the cultural and historical significance of the site as a result of the approximately 3,000 year old Hohokam Indian village atop the hill as well the historic volcanic stone buildings and their current uses. Certainly Tumamoc Hill is a local and national treasure worthy of preservation. Please feel free to contact me if you would like to discuss this or have questions. Thank you. Russell P. Long, CRB, CLHS	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/19/2014	Email	R. Brooks Jeffrey	University of Arizona	Cultural / Historic resources	Ms. Pereira: I'm writing at the request of Dr. Michael Rosenzweig to express my advocacy on behalf of Tumamoc Hill's preservation as a rich cultural landscape. Instead of a long essay defining cultural landscapes (if you don't already know) and recognizing Tumamoc Hill's significance as a multi-layered tell of natural and cultural features, I've attached a presentation I've given many times as a vehicle to educate the various constituencies for whom Tumamoc Hill holds value. I hope this assists to inform any future decisions that may impact Tumamoc Hill. Feel free to contact me directly with any specific questions. Sincerely, Brooks R. Brooks Jeffery	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/20/2014	Mail	Michael Kaiserman	Public	Cultural / Historic resources	Dear Ms. Pereira, I am writing to you to encourage your organization to join forces with many other organizations that are already supporting members for the preservation of the archaeology, cultural history and ecology of Tumamoc Hill. It is my perception that the FirstNet activity would provide a beneficial service to significantly broaden the exposure Tumamoc Hill would have nationally. As I have travelled to Egypt, Greece, Turkey, Israel , Great Britain, Norway, and Mexico were I have visited many of the historical and ancient wonders, not to mention many sites here in the U.S., I believe Tumamoc Hill ranks up there with all these sites in the same historical and ancient context. I trust your organization will come to the same conclusion and move forward with plans to include Tumamoc Hill in the FirstNet activity. Thank you very much for your consideration. Michael Kaiserman Engineering Fellow, Raytheon Missile Systems (Retired)	Thank you for your comment.
12/22/2014	Email	Bruce Hilpert	Public	Cultural / Historic resources	I urge you to protect the cultural resources on the top of Tumamoc Hill in Tucson. This historic/prehistoric site has unique constructions that give insight into the prehistory of the Southwest. Further constructions endangers these resources. I urge you to limit construction on this site to areas that have been previously disturbed and allow no further destruction of these resources. Thank you, Bruce Hilpert	Thank you for your comment.

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12/22/2014	Email	Charles Broder	Public	Cultural / Historic resources	Allowing first responders to communicate with each other is a very important goal. I sincerely hope that this goal will not be allowed to compromise the important cultural remnants and significance of Tumamoc Hill. It is a treasure which must be preserved.	Thank you for your comment.
12/22/2014	Email	Gayle Harrison Hartman	Public	Cultural / Historic resources	Firstnet, I don't know exactly what you are planning for Tumamoc Hill but you need to know that it is a National Historic Landmark and, as an archaeological site, is listed on the National Register of Historic Places. The hill was used by prehistoric people at least as long ago as 500 B.C. The summit is surrounded by low basalt "walls" (linear rock piles extending for many yards), and the summit itself contains dozens of prehistoric pit structures. There are also over 700 examples of prehistoric rock art on the summit and slopes of the hill. These were recently recorded and published as "Tumamoc Rock Art Revisited: With a Focus on Temporal Affiliation and Management" by Gayle Harrison Hartmann and Peter C. Boyle. The monograph was part of Arizona State Museum Archaeological Series No. 208; the entire publication was entitled New Perspectives on the Rock Art and Prehistoric Settlement Organization of Tumamoc hill, Tucson, Arizona, edited by Gayle Harrison Hartmann and Peter C. Boyle. It is extremely important that no damage be done to the basalt "walls," (trincheras in Spanish), pit house structures, rock art and other manifestations of prehistoric or historic activity on the hill. If you have not already done so, please contact Todd Pitezel at the Arizona State Museum as soon as possible. He is the archaeologist in charge of protecting the hill. pitezel@email.arizona.edu. Thank you, Gayle Harrison Hartmann	Thank you for your comment.
12/22/2014	Email	Georgia Erdmann	Arizona Site Steward	Cultural / Historic resources	Thank you for your consideration when you make decisions regarding placing a tower on Historic Tumamoc Hill. It is a great relief to know that you will use the pads that are already in existence and thus save some endangerment of this ancient site. It is such a great opportunity to work together to honor the ancient archaeology of the area. Thank you again. Respectfully, Georgia Erdmann	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/22/2014	Email	Jane Levin	Public	Cultural / Historic resources	I am a volunteer archeological site steward in Pima County. I am writing to encourage you to restrict any construction on the antenna pads on Tumamoc Hill. The trincheras there are ancient and precious and need to be protected. Thank you for your consideration. Sincerely, Jane Levin	Thank you for your comment.
12/22/2014	Email	Jaye S. Smith	Public	Cultural / Historic resources	Dear Ms. Pereira; As a Pima County resident and an avid archaeological enthusiast, I am extremely concerned about the proposed impact to the most important site, both historically and archaeologically, in Pima County - Tumamoc Hill. This site is extremely important for ongoing research about Hohokam Cultures, as well as immense local historical value to many of Pima County's first pioneer families, the University of Arizona, the UA School of Anthropology and the Arizona State Museum. Please help protect Tumamoc Hill by limiting the proposed construction to the existing antenna pads. I fully realize the importance of providing advanced communications for our first responders, but it is also important to protect the ancient trincheras sites and petroglyphs such as those found on Tumamoc Hill that we can never replace or restore once impacted. So many important archaeological sites in Pima County have been lost in recent years; we just can not afford to lose a treasure as important as Tumamoc Hill. As a proud member the Arizona State Museum, the Arizona Archaeological and Historical Society and Archaeology Southwest, I am committed to offer whatever help or assistance is needed to develop a plan that will provide the necessary communications structure and preserve this irreplaceable Hohokam site. Thank you for your attention; Sincerely; Jaye S. Smith	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/22/2014	Email	Judith Reisman	Site Steward	Cultural / Historic resources	As an archeological site steward, I help protect a very old Hohokam site from theft and vandalism. I am in complete support of creating a first responders wifi network, but respectfully ask that any new hardware installations on Tumamoc Hill be confined to existing hardware sites so that the rest of this precious archeological site remains. It is wonderful to think of using the internet to help our first responders in disasters and emergencies. It is also wonderful that you'all are so ready to be partners in preserving the rest of the aspects of this site. Thank you, Judith Reisman, site steward	Thank you for your comment.
12/22/2014	Email	Kaitlin Meadows & Albert Lannon	Wild Heart Ranch	Cultural / Historic resources	Please limit FirstNet construction on Tucson's Tumamoc Hill to existing antenna sites so that new footprints are not created. Any new work away from already-disturbed areas will impact negatively on ancient archeological sites, sites that contain habitation and farming areas, rock art with an amazing number of solstice and equinox markers, and artifacts that continue to help archaeologists understand the ancient history of this important area. Several years ago we helped document some of those solstice markers. To stand on the top of Tumamoc Hill as the sun rose in the east and the full moon set in the west on the Winter Solstice and see the sudden light -- "sun daggers"-- on petroglyphs mark the changing of the season was a magical and humbling experience. It speaks to the knowledge, skill, and ability of those ancient people as something well worth preserving. Thank you, Kaitlin Meadows & Albert Lannon	Thank you for your comment.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/22/2014	Email	Katherine Cerino	Arizona Archaeological and Historical Society	Cultural / Historic resources	First, I am pleased with the Firstnet efforts - this seems like a very sensible idea. The purpose of this note is to bring to your attention the importance archaeologically of Tumamoc Hill in Tucson. The Hill has already been impacted by many towers some of which are no longer in use. I would like to ensure that the development you carry out on the Hill uses the existing disturbed footprint rather than adding to it. The Hill is archaeologically unique in the Tucson Basin in that it has some of the earliest habitation sites dating to 500 BC and some of the earliest pottery in the Basin. It was later used by the Hohokam people who pecked rock art over a great deal of the hill concentrating on the top where developmental impact is greatest. In addition, there are unique prehistoric walls around the hill. It was clearly an important and sacred place in the past and if you go up there today and simply look at the spectacular 380 degree view without even considering the importance of the past it is obviously a special place. Thank you, Katherine Cerino	Thank you for your comment.
12/22/2014	Email	Lance Trask	Public	Cultural / Historic resources	Dear Sir or Madam; I applaud the government for coming up with plans to have Wi-Fi available to first responders and an agency to oversee those plans. Communication at the beginning of an event is critical and can make the difference between life and death. It is likely that antennae(s) or repeaters will be considered at a location called Tumamoc Hill. It is ideal because it has a 360 degree view of a considerable portion of Southern Arizona. It is also on the National Register and holds valuable cultural resources. Some disturbances have already occurred on Tumamoc Hill and I urge you to consider placing any equipment in areas already impacted. Access to the top of the hill is via existing roads and these roads should be adequate for transporting and installing the equipment for the proposed Wi-Fi system. Currently the top of the hill is off limits and behind locked gates, so any installed equipment will be fairly well protected. I also urge you to work closely with the archaeological community within the Tucson area as they can provide expertise and work with the agency so it's needs are met and the cultural resources are preserved for the future. Thank you very much, Lance K. Trask	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/22/2014	Email	Linda Stelljes	Public	Cultural / Historic resources	As a historically and archaeologically sensitive area, I am asking that FirstNet help protect the ancient trincheras on Tumamoc Hill by restricting construction to the existing antenna pads, so our first responders can communicate while still allowing Pima County and the University of Arizona to protect this important place of the past. I am a member of Arizona State Parks Site Stewards, and we are all volunteers who devote our time and energy to preserving, monitoring and protecting historical Hohokam and other paleo-Indian sites in Arizona. Human history in the Southwest (and everywhere) is essential to understanding our ancestors and we should all be stewards of the sites that reveal clues to human civilization and how people lived in the past. What may not look important to the untrained eye can hold great significance to our understanding. Thank you for your attention on this matter. We can all work together to preserve and protect our history. Sincerely, Linda Stelljes	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/22/2014	Email	Peggy Wenrick	Arizona Site Steward	Cultural / Historic resources	I understand how important the project proposed for installation on Tumamoc Hill in Tucson, Arizona is for promoting quick response in emergencies. However, I want to stress the need for careful planning and execution of the project. I am an Arizona Site Steward who regularly monitors the condition of the archeological district elements on Tumamoc. Even after many visits, I am still awed to realize that early peoples created structures and lived in this special space. I request that every effort be made to minimize the footprint of the upcoming work and strongly urge the structure(s) be confined to the antennae pads already existing. Thank you for the opportunity to comment. Peggy Wenrick	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/22/2014	Email	Peter J. Baum	Public	Cultural / Historic resources	Hello Ms Pereira; Please accept my fervent plea that any Firstnet access to, and construction on, Tumamoc Hill be done with the utmost sensitivity to the petroglyphs and ruins of Tucson's first public architecture, going back over two thousand years! I've called Tucson home for fifty 50 years and worked downtown for the last 38. I've had the privilege of spending time atop the hill with extraordinary experts Paul and Suzi Fish, as well as fascinating petroglyph experts. I've sadly watched Tumamoc being "loved too much" by looters, and "loved too little" by Pima County's and the University of Arizona's budgetary stinginess. Too much irreversible damage has been done already. Please encourage Firstnet to be extraordinarly sensitive to the unique culture treasures still left on Tumamoc, minimize work to existing pads and overall trod with the lightest footprint possible. Thank you Peter J. Baum	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/22/2014	Email	Robert Wenrick	Arizona Site Steward	Cultural / Historic resources	I understand how important the project proposed for installation on Tumamoc Hill in Tucson, Arizona is for promoting quick response in emergencies. However, I want to stress the need for careful planning and execution of the project. I am an Arizona Site Steward who regularly monitors the condition of the archeological district elements on Tumamoc. Even after many visits, I am still awed to realize that early peoples created structures and lived in this special space. I request that every effort be made to minimize the footprint of the upcoming work and strongly urge the structure(s) be confined to the antennae pads already existing. Thank you for the opportunity to comment. Robert Wenrick	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Email	Denise Waldo	Pima County Procurement	Cultural / Historic resources	Please help protect the ancient trincheras on Tumamoc Hill by restricting construction to the existing antenna pads, so our first responders can communicate while still allowing Pima County and the University of Arizona to protect this important place of the past. My husband & I have been involved in a volunteer program to help protect archaeology sites for years. We are lucky in Arizona to have many wonderful & important sites, Tomamoc Hill being one of them. We respectfully ask that you consider the adverse impact your project could have on this site & do all you can to help protect it. Thank you. Denise Waldo, CPPB	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/23/2014	Email	Fran Maiuri	Public	Cultural / Historic resources	Dear Ms. Amanda Pereira: I am a resident of Tucson, Arizona and I am writing to ask you to minimize the impact on Tumamoc Hill in Tucson, AZ during the construction of the FirstNet communication system. This is an extremely rich Archaeological site, one of the most important in the Tucson area. There is much on the mountain that could still inform us about our early ancestors and those features and artifact should not be disturbed. I understand the value of the FirstNet communication being put in place and support the project as long as the land where current antenna pads exist is used for the work. Please do not disturb any of the rest of this site, the archaeological site and any of the natural features and environment. Let's do this work so that the area where our prehistoric ancestors lived, worked, worshipped and recreated is untouched	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Email	Fran Maiuri	Public	Biological Resources	and where native plants, animals, insects and birds continue to enjoy this natural area within Tucson. What is disturbed cannot be brought back again and will no longer be available as natural habitat and for future research and better understanding of the past. Thank you. Sincerely, Fran Maiuri	
12/23/2014	Email	John A. Armstrong	Public	Cultural / Historic resources	Please help preserve areas of archaeological interest on Tumamoc Hill in Tucson, Arizona by limiting construction to existing antenna pads.	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Email	Keith Bagwell	District Five Pima County Supervisor	NOI	Ms. Amanda Pereira, Please see the attached letter, submitted on behalf of District Five Pima County Supervisor Richard Elías as comments on activities FirstNet is considering with regard to Tumamoc Hill in Tucson, Arizona. The original letter will be sent to you via postal mail. Yours truly, Keith Bagwell	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Email	M. Nichols	Public	Cultural / Historic resources	Tumamoc Hill is a critical site of an ancient inhabited area, 10,000 plus years ago, in North America. There is only one other site similar to this one, in Sonora, Mexico. It is imperative that old pads be used for the towers, protecting the areas that have not been disturbed. This site is not only a treasure for the residents of Tucson and the University of Arizona, it is a treasure on the North American Continent. Your help in protecting this site is invaluable and will become an excellent public relations tool as your company expands. Thank you for becoming partners in protecting such a unique and ancient example of early civilization in the Americas. M. Nichols	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Mail	Richard Elias	Pima County Board of Supervisors	Cultural / Historic resources	Dear Ms. Pereira, It has come to my attention that FirstNet activities might have an impact on Tumamoc Hill,an iconic landmark that towers over the west side of the Tucson metropolitan area, in the Pima County District that I am elected to represent. Tumamoc Hill is a very special place. As a result the Pima County Board of Supervisors, upon which Iserve,bought 320 acres of land on and around the hill in 2009 to protect it from development and unsuitable uses. There are now 860 acres of land on and around the hill protected in perpetuity. This hill was inhabited by Native Americans for thousands of years, ancestors of today's Tohono O'Odham Nation members, and carries an O'Odham name, Tumamoc, which is their word for horned lizard. Remains of their residency and farming on the hill are visible and subject of substantial study.	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Mail	Richard Elias	Pima County Board of Supervisors	Biological Resources	The Carnegie Foundation established a Desert Botanical Laboratory on Tumamoc Hill in 1903 to study scientifically the unique flora of the Sonoran Desert, and the buildings associated with it are together a National Historic Landmark. A University of Arizona operation since 1960,the laboratory has studied desert flora continuously for longer than any other facility in the world. Its records are priceless.	Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/23/2014	Mail	Richard Elias	Pima County Board of Supervisors	Aesthetics / Recreational Use	Tumamoc' s unique shape and urban presence set it off as a unique and special sight for area residents and their visitors. The narrow, winding road up it leading to the laboratory has become a very popular exercise path for thousands of local residents. Tumamoc Hill is a special iconic feature that deserves protection and its many fragile features require careful treatment. Sincerely Richard Elias District Five Pima County Supervisor	Thank you for your comment.
12/23/2014	Email	Sherry Massie	Public	Cultural / Historic resources	Dear Ms. Pereira, I understand that FirstNet is a federal program which will allow first responders all over the U.S. to communicate with each other, as needed, by deploying a new national Wi-Fi network using a reserved public safety broadband range. I think this is a wonderful goal for our nation, but I realize this may also impact a very important historical/archaeological site - the ancient trincheras on Tumamoc Hill in Tucson, AZ. Would you please consider restricting construction to the existing antenna pads so that as little impact as possible occurs to this historic area? Although I have lived in Tucson for 13 years, I only recently visited this site through the auspices of the Arizona Archaeological and Historical Society. I had no idea that there were trincheras there dated to 300 B.C., and that there was evidence of Hohokam settlement dating to 800 A.D. I saw some amazing rock art, as well as evidence of solar markers and alignments. It's an impressive site so close to a major urban area, and one that needs to be preserved for everyone to be able to have to same opportunity as I had to learn and enjoy part of our southwestern legacy. I hope you will be able to complete your Wi-Fi goal as well as helping preserve this important landmark. Thank you for your consideration. Sincerely yours, Sherry Massie	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/24/2014	Email	Aaron D. Flesch, Ph.D.	University of Arizona	Cultural / Historic resources	Dear Ms. Amanda Pereira: It has come my attention that the activities of Firstnet may eventually affect the ecological, social, and cultural values of Tumamoc Hill. Thus, I wanted to write to you to express the value of Tumamoc so that this information can be applied when evaluating the potential impacts of any proposed Firstnet activities on or around Tumamoc. Tumamoc Hill is a National Historic Landmark, a U.S. Archaeological District, and its value to the local, regional, national, and global communities are immense.	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/24/2014	Email	Aaron D. Flesch, Ph.D.	University of Arizona	Biological Resources	As an ecologist that works on the Hill, and as a member of the Tucson community that walks the Hill and helps interpret its natural history and ecology to the public, I can speak specifically about Tumamoc's ecological and social values. In the first decade of the 1900s, some of our nation's first ecologists were tasked with locating a site to study desert plants and placing what would become the US' first ecological research station. At that time when the landscape was largely undeveloped and options for placing the stations nearly unlimited, they considered sites in Arizona, New Mexico, California, and the neighboring Mexican states of Sonora and Chihuahua. In the end, they chose Tumamoc for the site because of its remarkable diversity, exceptional natural qualities, and the fact that the Hill and surroundings included a large number of plant communities for study. Those facts speak to the uniqueness and incredible value of the Hill and the natural vegetation that still covers it. For the next 100 years scientists working on the Hill have made immeasurable contributions to our understanding of how the natural world is structured and how it functions, and those activities continue to this day under the leadership of Director Rosenzweig.	Thank you for your comment.
12/24/2014	Email	Aaron D. Flesch, Ph.D.	University of Arizona	Aesthetics / Recreational Use	As the surroundings around the Hill have changed over the last 100 years, the values of Tumamoc have grown. Tumamoc sees tens or perhaps hundreds of thousands of visitors each year of all ages and backgrounds. Many of those visitors live in a suburban or urban environment where they have little opportunity to experience the Sonoran Desert in its natural state and to connect with nature on deeper spiritual and aesthetic levels. Those qualities and experiences are offered by Tumamoc because of its close proximity to those populations and the accessibility the University of Arizona and the station's Director have provided. Please consider the remarkable and multifaceted values of Tumamoc Hill and the Desert Laboratory in your plans and proposals related to the Firstnet project. Feel free to contact me at the address below if I can be of help. My regards Aaron D. Flesch, Ph.D.	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/24/2014	Email	Brian Metcalf	Public	Cultural / Historic resources	Ms. Amanda: I am contacting you regarding the planned update of the communications infrastructure on Tumamoc Hill for first responders. Tumamoc is almost in the heart of Tucson. It is been a protected area of biological research for over a century. contains invaluable archaeological artifacts that ere well over 2000 years old. I ask you to please protect those irreplaceable resources for future generations. Please restrict your construction activities to existing antenna pads. Thank you. Brian Metcalf	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/24/2014	Mail	Courtney Rose, PhD.	Pima County Sustainability and Conservation	Cultural / Historic resources	Dear Ms. Pereira: This letter is a response to the request for comments on the proposed undertaking published in the Notice in the Federal Register (Vol. 79, No. 218). Tumamoc Hill has several important federal and state designations. Comprised of some 870 acres, it is an Archaeological District listed in the National Register of Historic Places and the Desert Laboratory was designated a National Historic Landmark in 1965. In 1976, the Desert Laboratory and Tumamoc Hill were together designated a National Environmental Study Area by the Department of Interior; and designated by the State of Arizona as a State Scientific and Educational Natural Area in 1981. Tumamoc Hill is also considered a traditional cultural property and ancestral site to local Tribes. Tumamoc Hill's peak rises to an elevation of 3,108 ft (947 m) above sea level. Located just west of downtown Tucson in T14S, R13E, Sections 9, 10, 16, and 15, the preservation of its cultural and scientific significance is of great importance to the local community and at a national level. Land ownership includes the University of Arizona on behalf of the Board of Regents, Pima County, Arizona State Land Department, and the City of Tucson. Archaeol ogical surveys of Tumamoc Hill began in the 1970s followed by subsequent limited archaeological excavations. Known as Cemamagi Do'ag in O'odham,Tumamoc Hill, archaeological site designated AZ AA:16 :6(ASM)], is known to have multiple prehistoric occupations that left behind remnants of large rock walls (trincheras) , petroglyphs, agricultural fields, pithouses, and O'odham cemeteries. A recent undertaking on Tumamoc Hill included the consolidation of wireless facilities and replacing several towers with a single communications tower (by the Pima County Wireless Integrative Network (PCWIN) project implemented in 2014). As the construction included consolidation and the dismantling unused buildings, the overall footprint was reduced . State, Federal, and Tribal consultation resulted in a determination of Adverse Effect to the Area of Potential Effect for Direct Effects and for Visual Effects to the Tumamoc Hill Archaeologi cal District. The undertaking licensed by the Federal Communications Commission (FCC) required an Environmental Assessment to fulfill requirements under the National Environmental Policy Act (NEPA) and a Memorandum of Agreement was executed to fulfill Section 106 of the National Historic Preservation Act (NHPA). Mitigation strategies included archaeological data recovery and cultural sensitivity education program in accordance with the Arizona State Historic Preservation Office and the Advisory Council on Historic Preservation .The Univers ity of Arizona Tumamoc Hill Cultural Resources Policy and Management Plan (2008) specifies tribal interests in restoring Tumamoc Hill to its former natural condition.	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/24/2014	Mail	Courtney Rose, PhD.	Pima County Sustainability and Conservation	Cultural / Historic resources	In summary, Tumamoc Hill official designations include: -The Desert Laboratory (comprising 870 acres on Tumamoc Hill) was designated a National Historic Landmark in 1965, and in 1966 was listed in the National Register of Historic Places (National Register No.66000190).Active biological studies are ongoing on a portion of the hill, which was designated as a National Environmental Study area in 1976 by the U.S. Department of the Interior and designated as an Arizona State Scientific and Educational Natural Area in 1981 by the Arizona State Parks Board. -The same 870 acres comprises the Tumamoc Hill Archaeological District, which was listed in the National Register of Historic Places in 2010. -The Tohono O'odham Nation, the Hopi Tribe, the Pascua Yaqui Tribe, the Gila River Indian Community, the Ak-Chin Indian Community, and the Salt River Pima-Maricopa Indian Community consider Tumamoc Hill an ancestral site of cultural significance. -Should FirstNet propose to include Tumamoc Hill in its network planning, it is critical that the cultural, natural, and scientific significance of this site be considered and impacts to the site be avoided. Sincerily, Courtney Rose, Ph.D., Program Coordinator Pima County Office of Sustainability & Conservation Cultural Resources and Historic Preservation Division	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/24/2014	Email	Courtney Rose, PhD.	Pima County Public Works Center, Office of Sustainability and Conservation	NOI	Good afternoon: Please see attached document with comments regarding Tumamoc Hill, located in Tucson, Arizona. The letter is a response to a request for comments by the First Responder Network Authority NOI to Prepare Programmatic Environmental Impact Statements and Conduct Scoping for the Nationwide Public Safety Broadband Network [Federal Register/Vol 79/No. 218]. Thank you for your consideration. Courtney Rose	Thank you for your comment.
12/26/2014	Email	Steve Long	Long Realty Company	Cultural / Historic resources	Thank you Russell! Let me know how I can help. Steve On Tue, Dec 16, 2014 at 6:36 AM, Long, Russell <longs@longrealty.com> wrote: To Whom It May Concern, Tumamoc Hill has been a fixture in our family since the very early 1900's when our great grandfather, Burton Bovee, began working there. Long before we every visited there and as children our mother told us tales of Burton working there, riding his horse and mule all over the Tucson basin collecting samples and specimens. As adults we became aware of the cultural and historical significance of the site as a result of the approximately 3,000 year old Hohokam Indian village atop the hill as well the historic volcanic stone buildings and their current uses. Certainly Tumamoc Hill is a local and national treasure worthy of preservation. Please feel free to contact me if you would like to discuss this or have questions. Thank you. Russell P. Long, CRB, CLHS	Thank you for your comment.
12/27/2014	Email	Quincy M. Kennedy	Public	Cultural / Historic resources	Thank you for offering to read our comments on the proposed communications towers on Tumamoc Hill. I study archaeology and am intimately aware of the hill's value as a cultural resource. Communication for first responders is very important, but please be careful with the cultural resources up there.	Thank you for your comment.
12/28/2014	Email	Doug Little	Public	Cultural / Historic resources	Please protect the ancient *trincheras* on Tumamoc Hill by restricting construction to the existing antenna pads, so our first responders can communicate while still allowing Pima County and the University of Arizona to protect this important place of the past.	Thank you for your comment.
12/28/2014	Email	Larry Venable	University of Arizona	Cultural / Historic resources	I am writing to explain to you the high cultural, historic and ecological value of Tumamoc, a research station of the University of Arizona in Tucson. This property is sacred to 5 southwestern native American tribes, with human constructions dating back at least 2,000 years.	Thank you for your comment.
12/28/2014	Email	Larry Venable	University of Arizona	Biological Resources	Since 1903 it has been an ecological research station, first of the Carnegie Institute of Washington, now of the University of Arizona. Important work in the history of ecology was and is conducted here. Some ongoing long-term ecological projects have been running for over 100 years and the data has been recently archived at Ecological Archives, Ecological Society of America. There are over 20 ongoing ecological projects, some funded by the National Science Foundation. I invite you to please join us in preserving and enhancing this wonderful long-standing resource. Larry Venable	Thank you for your comment.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/28/2014	Email	Marilyn Guida	Public	Cultural / Historic resources	Dear Ms Amanda Pereira, I write to urge that the FirstNet need for access to Tumamoc Hill in Tucson, Arizona will contribute to preservation of the cultural, archaeological and biological resources of the area by making use of the existing pads for the antennas, transmitters, and other equipment needed by FirstNet. This is an area of cultural significance to the Tohono O'odham Tribe from the 15th Century to modern times. It also contains evidence of occupation from the Early Agricultural Period of the indigenous people as far back as 2,000 years ago as well as the Hohokam people circa A.D. 800 (1100 years ago). This length of human occupation is highly significant and an important reason why modern construction in this area should not be expanded. The University of Arizona currently manages many currently active research projects into the cultural and biological resources of this area. This is an additional reason why expansion of present areas impacted construction should not be allowed. Perhaps most important of all is the impact to the Tohono O'odham people who have used this area for at least five centuries and continue to use it today. As the first Americans, we should respect their longstanding rights to use of Tumamoc Hill as our first priority. Thank you for considering this plea, Marilyn Guida	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/28/2014	Email	Michael Rosenzweig	University of Arizona	Cultural / Historic resources	Dear Ms Pereira, I have more to add to the FirstNet scoping process. As I promised, I have tracked down and am sending a number of documents relating to Tumamoc Hill. Eight pdf files are attached. (There could have been more if there had been more time.) The files include: ** three from county documents of November 2007. One of these contains comments of US Rep Raúl M. Grijalva, as well as the strong point made by Dr. Ned Norris Jr. (Chairman of the Tohono O'odham Nation), i.e., that Tumamoc has spiritual significance to the Nation and other tribes. (By the way, Pima County, in early 2009, did buy the land mentioned in the discussions. I have a video of the auction.) ** three from The University of Arizona management plan for Tumamoc. These cover the 2007 plan of the City of Tucson, acknowledgment of the importance of the Hill to native tribes, and restrictions on lessees to prevent further degradation of the Hill. ** an excerpt from an Island Press book about restoration ecology, acknowledging that Tumamoc Hill originated this crucial part of environmental conservation. ** an excerpt from a recent newsletter of the University's Dept of Ecology & Evolutionary Biology. Thank you again for the care you have taken to learn about our area in preparation for FirstNet planning. Sincerely, Michael Rosenzweig Director, Tumamoc: People & Habitats University of Arizona Tucson	Thank you for your comment.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	NOI	Dear Ms. Pereira : The U.S. Environmental Protection Agency has reviewed the November 12, 2014 Notice of Intent to prepare Programmatic Environmental Impact Statements and Conduct Scoping for the Nationwide Public Safety Broadband Network. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508) and § 309 of the Clean Air Act. To assist in the scoping process for this project , we have identified several issues for your attention in the preparation of the Western regional EIS. We are most concerned about the following issues: impacts to water and air, impacts to biological resources, invasive species management , and habitat protection. We appreciate the opportunity to review this NOI and are available to discuss our comments. Please send one hard copy of the Draft PEIS and one CD ROM copy to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at (415) 972-3545, or contact Scott Sysum, the lead reviewer for this project. Scott can be reached at (415) 972- 3742 or sysum.scott @epa.gov.	Thank you for your comment.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Purpose and Need	US EPA DETAILED COMMENTS ON THE NOTICE OF INTENT TO PREPARE PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENTS AND CONDUCT SCOPING FOR THE NATIONWIDE PUBLIC SAFETY BROADBAND NETWORK, DECEMBER 29, 2014 Statement of Purpose and Need The Draft Programmatic Environmental Impact Statement should clearly identify the underlying purpose and need to which the First Responder Network Authority is responding in proposing the alternatives (40 CFR 1502.13). The purpose of the proposed action is typically the specific objectives of the activity, while the need for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity. Recommendation: The purpose and need should be a clear, objective statement of the rationale for the proposed project.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Alternatives	Alternatives Analysis The National Environmental Policy Act requires evaluation of reasonable alternatives, including those that may not be within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). A robust range of alternatives will include options for avoiding significant environmental impacts. The DPEIS should provide a clear discussion of the reasons for the elimination of alternatives which are not evaluated in detail. Alternative network routes, including buried or aerial options, as well as environmentally preferable routes, should be evaluated. The DPEIS should also evaluate alternative configurations for access roads. The alternatives analysis should describe the approach used to identify the alternative routes and the criteria used to select the different routes. The environmental impacts of the proposed action and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). The potential environmental impacts of each alternative should be quantified to the greatest extent possible (e.g., acres of forest impacted, tons per year of emissions produced). Recommendations: The DPEIS should describe how each alternative was developed, how it addresses each project objective, and how it will be implemented. The DPEIS should describe the methodology and criteria used for determining the network route and alternative routes. The alternatives analysis should include a discussion of environmentally preferable options for the network, including the use of underground cables versus overhead wires; alternative configurations for access roads; and alternative methods of construction, such as using heavy lift helicopters to transport and set cell towers. The DPEIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects (40 CFR 1508.27).	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.

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12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Water Resources	Water Resources Geographic Extent of Waters of the United States The project applicant should coordinate with the U.S. Army Corps of Engineers to determine if the proposed project requires a Section 404 permit under the Clean Water Act. Section 404 regulates the discharge of dredged or fill material into waters of the United States (WUS), including wetlands and other special aquatic sites. The DPEIS should describe all WUS that could be affected by the project alternatives, and include maps that clearly identify all waters within the project area. A jurisdictional delineation will confirm the presence or absence of WUS in the project area and help determine whether or not the proposed project would require a Section 404 permit. Recommendation: The DPEIS should discuss the potential that WUS could be affected and that consultation with the USACE may be required to determine if there are jurisdictional WUS present at individual project sites. Drainages, Ephemeral Washes, and Floodplains Natural washes perform a diversity of hydrologic, biochemical, and geochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems, such as adequate capacity for flood control, energy dissipation, and sediment movement; as well as impacts to valuable habitat for desert species. Recommendations: The DPEIS should discuss the potential that individual projects may impact aquatic features that are determined not to constitute WUS, and discuss potential mitigation. The DPEIS should address the potential effects of project discharges, if any, on surface water quality.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Biological Resources	Biological Resources, Habitat and Wildlife The DPEIS should identify all petitioned and listed threatened and endangered species and critical habitat that might occur within individual project areas. The document should identify and quantify which species or critical habitat might be directly, indirectly, or cumulatively affected by each alternative and mitigate impacts to these species. Emphasis should be placed on the protection and recovery of species due to their status or potential status under the federal or state Endangered Species Act. Network line rights of way are anthropogenic disturbances which alter the spatial structure of habitat elements, creating linear patches or line corridors which in tum impact ecological integrity by modifying ecological processes (abiotic & biotic) at various scales. Network line ROWs can result in habitat fragmentation and increased habitat edge effects, affecting individual species with different intensity. Recommendations: The DPEIS should discuss how the proposed action would comply with ESA requirements, including any necessary ESA Section 7 consultation efforts with the U.S. Fish and Wildlife Service. EPA recommends that FirstNet coordinate with USFWS field offices and with applicable state biological resource management agencies to ensure that current and consistent surveying, monitoring, and reporting protocols will be applied in protection and mitigation efforts. The DPEIS should describe the potential for habitat fragmentation and obstructions for wildlife movement from the construction of individual projects and other projects in the area. Discuss the need for monitoring, mitigation, and if applicable, translocation management plans for the sensitive biological resources. This could include, but is not limited to, a Bird and Bat Conservation Strategy, a Raven Monitoring, Management, and Control Plan, and Special - Status Plant Impact Avoidance and Mitigation Plan. The DPEIS should include assurances that the design of the aerial lines would be in compliance with current standards and practices that reduce the potential for raptor fatalities and injuries.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.

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12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Biological Resources	The EPA is also concerned about the potential impacts of construction, installation, and maintenance activities (grading, filling) on habitat. We encourage the use of alternatives that avoid and protect high value habitat and create or preserve linkages between habitat areas. We are also concerned with management of the ROW, specifically vegetation control, in order to prevent natural forest succession. ROW management is usually practiced to protect the system from windfall, contact with trees and branches, and other potential hazards. Additionally access roads are maintained in order to ensure access for maintenance and upkeep of the system components. Recommendations: , The DPEIS should describe potential impacts from construction, installation, and maintenance activities on habitat and threatened and endangered species. The DPEIS should describe the ROW vegetation management techniques to be used and potential associated environmental impacts, especially if mechanical methods or herbicides are to be used. The DPEIS should indicate the location of important wildlife habitat areas. The DPEIS should describe what measures will be taken to protect important wildlife habitat areas and to preserve linkages between them.	
					Invasive Species Human actions are the primary means of invasive species introductions. The construction of network lines may cause disturbance of ROW soils and vegetation through the movement of people and vehicles along the ROW, access roads, and laydown areas. These activities can contribute to the spread of invasive species. Parts of plants, seeds, and root stocks can contaminate construction equipment and essentially "seed" invasive species wherever the vehicle travels. Invasive species infestations can also occur during periodic buried/aerial line ROW maintenance activities especially if these activities include mowing and clearing of vegetation. Once introduced, invasive species will likely spread and impact adjacent properties with the appropriate habitat. Executive Order 13112, Invasive Species (February 3, 1999), mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Executive Order 13112 also calls for the restoration of native plants and tree species. If the proposed project will entail new landscaping, the DPEIS should describe how the project will meet the requirements of Executive Order 13112. In addition, we encourage alternative management practices that limit herbicide use, focusing instead on other methods to limit invasive species vegetation and decrease fire risk. Recommendations: The DPEIS should describe the invasive plant management plan used to monitor and control noxious weeds. If herbicides or pesticides will be used to manage vegetation, the DPEIS should disclose the projected quantities and types of chemicals. The invasive plant management plan should identify methods that can be used to limit the introduction and spread of invasive species during and post-construction. These measures can include marking and avoidance of invasive species, timing construction activities during periods that would minimize their spread, proper cleaning of equipment, and proper disposal of woody material removed from the ROW. Because construction measures may not be completely effective in controlling the introduction and spread of invasives, the DPEIS should describe post-construction activities that will be required such as surveying for invasive species following restoration of the construction site and measures that will be taken if infestations are found.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Air Quality	Air Quality The DPEIS should provide a discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards, criteria pollutant nonattainment areas, and potential air quality impacts. The DPEIS should describe and estimate air emissions from potential construction and maintenance activities, as well as proposed mitigation measures to minimize those emissions. The EPA recommends an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics). Recommendations: • Existing Conditions - The DPEIS should provide a detailed discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in the vicinity of the project. • Quantify Emissions - The DPEIS should estimate emissions of criteria pollutants and green house gasses from the proposed individual projects and discuss the timeframe for release of these emissions over the lifespan of the projects. The DPEIS should describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions. • Specify Emission Sources - The DPEIS should specify the emission sources by pollutant from mobile sources, stationary sources, and ground disturbance. This source specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention. • Construction Emissions Mitigation Plan -The DPEIS should include a draft Construction Emissions Mitigation Plan and ultimately adopt this plan in the Record of Decision. In addition to all applicable local, state, or federal requirements, we recommend the following control measures (Fugitive Dust, Mobile and Stationary Source and Administrative) be included in the Construction Emissions Mitigation Plan in order to reduce impacts associated with emissions of particulate matter and other toxics from construction-related activities:	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.

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					o Fugitive Dust Source Controls: The DPEIS should identify the need for a Fugitive Dust Control Plan to reduce Particulate Matter 10 and Fine Particulate Matter 2.5 emissions during construction and operations. We recommend that the plan include these general commitments: • Stabilize heavily used unpaved construction roads with a non-toxic soil stabilizer or soil weighting agent that will not result in loss of vegetation, or increase other environmental impacts. • During grading, use water, as necessary, on disturbed areas in construction sites to control visible plumes. • Vehicle Speed • Limit speeds to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions. • Limit speeds to 10 miles per hour or less on unpaved areas within construction sites on un-stabilized (and unpaved) roads. • Post visible speed limit signs at construction site entrances. • Inspect and wash construction equipment vehicle tires, as necessary, so they are free of dirt before entering paved roadways, if applicable. • Provide gravel ramps of at least 20 feet in length at tire washing/cleaning stations, and ensure construction vehicles exit construction sites through treated entrance roadways, unless an alternative route has been approved by appropriate lead agencies, if applicable. • Use sandbags or equivalent effective measures to prevent run-off to roadways in construction areas adjacent to paved roadways. Ensure consistency with the project's Storm Water Pollution Prevention Plan, if such a plan is required for the project • Sweep the first 500 feet of paved roads exiting construction sites, other unpaved roads en route from the construction site, or construction staging areas whenever dirt or runoff from construction activity is visible on paved roads, or at least twice daily (less during periods of precipitation). • Stabilize disturbed soils (after active construction activities are completed) with a non-toxic soil stabilizer, soil weighting agent, or other approved soil stabilizing method. • Cover or treat soil storage piles with appropriate dust suppressant compounds and disturbed areas that remain inactive for longer than 10 days. Provide vehicles (used to transport solid bulk material on public roadways and that have potential to cause visible emissions) with covers. Alternatively, sufficiently wet and load materials onto the trucks in a manner to provide at least one foot of freeboard. • Use wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) where soils are disturbed in construction, access and maintenance routes, and materials stock pile areas. Keep related windbreaks in place until the soil is stabilized or permanently covered with vegetation.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.

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					o Mobile and Stationary Source Controls: • If practicable, lease new, clean equipment meeting the most stringent of applicable Federal 1 or State Standards.2 In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible.3 • Where Tier 4 engines are not available, use construction diesel engines with a rating of 50 hp or higher that meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines,4 unless such engines are not available. • Where Tier 3 engine is not available for off-road equipment larger than 100 hp, use a Tier 2 engine, or an engine equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides and diesel particulate matter to no more than Tier 2 levels. • Consider using electric vehicles, natural gas, biodiesel, or other alternative fuels during construction and operation phases to reduce the project's criteria and greenhouse gas emissions. • Plan construction scheduling to minimize vehicle trips. • Limit idling of heavy equipment to less than 5 minutes and verify through unscheduled inspections. • Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed. o Administrative controls: • Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips. • Identify any sensitive receptors in the project area, such as children, elderly, and the infirm, and specify the means by which impacts to these populations will be minimized (e.g. locate construction equipment and staging zones away from sensitive receptors and building air intakes). • Include provisions for monitoring fugitive dust in the fugitive dust control plan and initiate increased mitigation measures to abate any visible dust plumes.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Infrastructure	Hardening of Infrastructure We understand that FirstNet will likely utilize existing commercial infrastructure to the maximum extent possible in its deployment of the Public Safety Broadband Network. Most likely, existing cellular towers, transport backhaul and data centers will need to be hardened to meet the stringent requirements of the PSBN. Hardening typically includes back up power supply, incorporating backhaul that is not easily disrupted (microwave or satellite), and stockpiling portable sites (Cell on Light Trucks or Cell on Wheels). Some of the larger cell phone companies have been hardening their infrastructure in disaster prone areas. Recommendation: The DPEIS should discuss the need for hardening sites, the use of portable equipment and the need for redundant or alternative backhaul equipment. FirstNet should commit to using as much commercially available equipment as possible and consider using as much renewable energy sources for backup power as is economically feasible.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Climate Change	Climate Change Scientific evidence supports the concern that continued increases in greenhouse gas emissions resulting from human activities will contribute to climate change. Global warming is caused by emissions of carbon dioxide and other heat-trapping gases. On December 7, 2009, the EPA determined that emissions of GHGs contribute to air pollution that "endangers public health and welfare" within the meaning of the Clean Air Act. One report indicates that observed changes in temperature, sea level, precipitation regime, fire frequency, and agricultural and ecological systems reveal .that parts of the western United States is already experiencing the measurable effects of climate change. 5 The report indicates that climate change could result in the following changes: poor air quality; more severe heat; increased wildfires; shifting vegetation; declining forest productivity; decreased spring snowpack; water shortages; a potential reduction in hydropower; a loss in winter recreation; agricultural damages from heat, pests, pathogens, and weeds; and rising sea levels resulting in shrinking beaches and increased coastal floods. Recommendation: The DPEIS should consider how climate change could potentially influence the proposed project, specifically within sensitive areas, and assess how the projected impacts could be exacerbated by climate change.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Waste	Hazardous Materials/Hazardous Waste/Solid Waste The DPEIS should address potential direct, indirect and cumulative impacts of hazardous waste from construction and operation of the proposed individual projects and facilities. The document should identify projected hazardous waste types and volumes, and expected storage, disposal, and management plans. It should address the applicability of state and federal hazardous waste requirements. Appropriate mitigation should be evaluated, including measures to minimize the generation of hazardous waste (i.e., hazardous waste minimization). Alternate industrial processes using less toxic materials should be evaluated as mitigation since such processes could reduce the volume or toxicity of hazardous materials requiring management and disposal as hazardous waste.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.

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12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Cumulative and Indirect Impacts	Cumulative and Indirect Impacts The cumulative impacts analysis should identify how resources, ecosystems, and communities in the vicinity of the project have already been, or will be, affected by past, present, or future activities in the project area. These resources should be characterized in terms of their response to change and capacity to withstand stresses. Trends data should be used to establish a baseline for the affected resources, to evaluate the significance of historical degradation, and to predict the environmental effects of the project components. For the cumulative impacts assessment, we recommend focusing on resources of concern or resources that are "at risk" and/or are significantly impacted by the proposed project, before mitigation. The EPA supports a regional assessment of the potential cumulative effects of other projects in the area to a range of resources, including aquatic, biological, and cultural resources. These findings should help inform current and future development proposed in the region. The EPA assisted in the preparation of a guidance document for assessing cumulative impacts in California that we find to be very useful. While this guidance was prepared for transportation projects in California, the principles and the 8-step process outlined therein can be applied to other types of projects and offers a systematic way to analyze cumulative impacts for a project. The guidance is available at: http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm. In accordance with this guidance, the EPA recommends that the DPEIS identify which resources are analyzed, which ones are not, and why. For each resource analyzed, the DPEIS should: • Identify the current condition of the resource as a measure of past impacts. For example, the percentage of species habitat lost to date. • Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or in stasis. • Identify all on-going, planned, and reasonably foreseeable projects in the study area that may contribute to cumulative impacts. • Identify the future condition of the resource based on an analysis of impacts from reasonably foreseeable projects or actions added to existing conditions and current trends. • Assess the cumulative impacts contribution of the proposed alternatives to the long-term health of the resource, and provide a specific measure for the projected impact from the proposed alternatives. • When cumulative impacts are identified for a resource, mitigation should be proposed. • Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts. • Identify opportunities to avoid and minimize impacts, including working with other entities. Recommendations: The DPEIS should consider the cumulative impacts associated with other development projects proposed in the individual project areas and the potential impacts on various	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Cultural / Historic resources	Coordination with Tribal Governments Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000), was issued in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Indian tribes. Recommendation: The DPEIS should describe the process and outcome of government-to-government consultation between FirstNet and each of the tribal governments within the individual project areas, issues that were raised (if any), and how those issues were addressed in the selection of the proposed alternative.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
					National Historic Preservation Act and Executive Order 13007 Consultation for tribal cultural resources is required under Section 106 of the National Historic Preservation Act. Historic properties under the NHPA are properties that are included in the National Register of Historic Places or that meet the criteria for the National Register. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer. Under NEPA, any impacts to tribal, cultural, or other treaty resources must be discussed and mitigated. Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800. Executive Order 13007, Indian Sacred Sites (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity, accessibility, or use of sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site. Recommendation: The DPEIS should address the existence of Indian sacred sites in the individual project areas. It should address Executive Order 13007, distinguish it from Section 106 of the NHPA, and discuss how FirstNet will avoid adversely affecting the physical integrity, accessibility, or use of sacred sites, if they exist. The DPEIS should provide a summary of all coordination with Tribes and with the SHPO/THPO (if any), including identification of NRHP eligible sites, and development of a Cultural Resource Management Plan.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Environmental Justice	Environmental Justice and Impacted Communities Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994) and the Interagency Memorandum of Understanding on Environmental Justice (August 4, 2011) direct federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations, allowing those populations a meaningful opportunity to participate in the decision-making process. Guidance6 by CEQ clarifies the terms low-income and minority population (which includes Native Americans) and describes the factors to consider when evaluating disproportionately high and adverse human health effects. Recommendations: The DPEIS should discuss the potential need to evaluate environmental justice populations within the geographic scope of the individual projects. If such populations exist, the DPEIS should discuss the potential for disproportionate adverse impacts to minority and low-income populations, and the approaches used to foster public participation by these populations. Assessment of the projects impact on minority and low-income populations should reflect coordination with those affected populations. The DPEIS should discuss the potential need to provide outreach to all communities that could be affected by the individual projects.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.

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12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Land Use	Coordination with Land Use Planning Activities The DPEIS should discuss how the proposed action would support or conflict with the objectives of federal, state, tribal or local land use plans, policies and controls in the individual project areas. The term "land use plans" includes all types of formally adopted documents for land use planning, conservation, zoning and related regulatory requirements. Proposed plans not yet developed should also be addressed it they have been formally proposed by the appropriate government body in a written form (CEQ's Forty Questions, #23b).	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Email Attachment	Ann McPherson	U.S. Environmental Protection Agency Region IX	Public Health and Safety	Public Health and Safety - Valley Fever Coccidioidomycosis, (kok-sid-oy-doh-my-KOH-sis), or Valley Fever, is a fungal infection that is almost always acquired from the environment via the inhalation of fungal spores. It can affect humans, many species of mammals and some reptiles .7 The fungus, Coccidioides, is endemic in the soil of the southwestern United States, Mexico, and parts of Central and South America. Coccidioides can live for long periods of time in soil under harsh environmental conditions including heat, cold, and drought. 8 Coccidioides can be released into the air when soil containing the fungus is disturbed, either by strong winds or activities such as farming or construction. Distribution of the fungus is typically patchy, but in some "hot spots," up to 70% of the human population has been infected. The number of reported Valley Fever cases in the U.S. has risen from less than 5,000 in 2001 to more than 20,000 cases in 2011.9 An estimated 150,000 more cases go undiagnosed every year. The majority of reported cases are located in Arizona and California. 10 The reason for the recent increase in cases, however, is unclear. Dust storms in endemic areas are often followed by outbreaks of coccidioidomycosis. If the dust storms are severe, the fungal spores can be carried outside the endemic area into neighboring counties, where outbreaks follow. According to the Centers for Disease Control and Prevention, workers engaged in soil-disturbing activities in endemic areas should be considered at risk for the disease. 12 Occupational groups at risk include farmers, agricultural workers, construction workers and archaeologists. Some groups of people appear to be at increased risk for disseminated disease and can become seriously ill when infected. People at risk for severe disease include those with weakened immune systems, persons with cancer or who are on chemotherapy, or persons who are HIV-infected. Also at higher risk for serious illness are the elderly, persons of African or Filipino descent, and women in the third trimester of pregnancy. Recommendations: The EPA recommends that the DPEIS discuss potential exposures to the fungus, Coccidioides, and susceptibilities of workers and nearby residents to Valley Fever due to soil-disturbing activities of the project. The Environmental Awareness Program for the workers should include training on the health hazards of Valley Fever, how it is contracted, what symptoms to look for, proper work procedures, how to use personal protective equipment, the need to wash prior to eating, smoking or drinking and at the end of the shift, and the need to inform the supervisor of suspected symptoms of work- related Valley Fever. The training should identify those groups of individuals most at risk and urge individuals to seek prompt medical treatment if Valley Fever symptoms (flu-like illness with cough, fever, chest pain, headache, muscle aches, and tiredness) develop.	The Programmatic Environmental Impact Statements will comply with all requirements under NEPA and other relevant laws, regulations, and Executive Orders.
12/29/2014	Mail	Diana Rhoades	Public	Cultural / Historic resources	Dear Ms. Pereira, Tumamoc Hill is a sacred place. It is on the National Register of Historic Places. It is a landmark, it is a University research station, studying plants and the changes in climate since 1903. It is a national archeological district, a burial ground for Native American People. It was an early trading post for the First People. It is rich in natural and cultural history. It should not be a place where the government places large towers or builds huge power lines. I hope you will carefully consider all the implications of FirstNet. All my best Diana Rhoades	Thank you for your comment.

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12/29/2014	Email	Doug Gann, Ph.D.	Archaeology Southwest	Cultural / Historic resources	Dear Firstnet I am writing in support of what I understand will be a new installation for our first responders on top of Tumamoc Hill in Tucson Arizona. I would like to offer the suggestion that Firstnet keep any new construction to areas of this hilltop that have already been disturbed by previous construction activities. We have known Tumamoc was an important archaeological site for 100 years, but it has only been in the past 10 years that the evidence has been understood in proper contexts. The ancient homes built on Tumamoc were constructed at the beginning of what we now know of as the ancient southwest culture area. The Cliff Dwellings in Mesa Verde, the stunning buildings of Chaco Canyon, the 5 story adobe Casa Grande, all of these places were built by a people who apparently got their start 4000 years ago, along the Santa Cruz River, where modern Tucson sits today. Though partially disturbed, the village on top of Tumamoc still contains evidence about how this pan-Southwestern culture began. What has not been destroyed should be preserved when ever possible. I think everyone in the archaeological community believes that your project needs to be supported, our community's safety has to come first. However, if new construction can be steered away from archaeologically critical areas, we also believe that we can achieve a win-win scenario here. Best Wishes, Doug Gann, Ph.D. Preservation Archaeologist	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
12/29/2014	Email	Scott Sysum	U.S. Environmental Protection Agency Region IX	NOI	Dear Ms. Pereira I have been assigned as the lead reviewer for the U.S. EPA Region 9 for the FirstNet National Public Safety Broadband Network PEIS Project. I have attached a pdf file of our scoping comment letter regarding this project. The signed letter was mailed today to Ms. Amanda Pereira. Thank you for providing us the opportunity to review this interesting project. Please feel free to contact us if you have any questions, seek clarifications or if we can help in any other way. v/r Scott Sysum	Thank you for your comment.
12/30/2014	Email Attachment	jph7890@aol.com	Public	Alternatives	The FirstNet Dilemma In order for FirstNet to succeed, it must provide broadband wireless service to public safety users for less than market rates. In addition, the FirstNet infrastructure must be more robust and more resilient than commercial wireless networks. The only way for FirstNet to achieve both of these goals is to leverage excess Nationwide Public Safety Broadband Network (NPSBN) capacity to create a revenue stream that subsidizes public safety user recurring monthly fees to the point that no commercial operator can undercut them. If the recurring monthly fees charged to public safety users by FirstNet is not significantly lower than commercial wireless rates, the commercial networks will likely simply lower their rates for public safety subscribers to undercut and undermine FirstNet. Financially strapped localities will likely choose the less expensive commercial network rather than subscribe to FirstNet, despite the fact that FirstNet will offer priority access to a more robust network. If such a scenario plays out, FirstNet will fail. Rather than becoming a customer of commercial wireless network operators, public safety should leverage the excess capacity in the NPSBN so that commercial operators and other secondary users become FirstNet customers, not vice versa. If Public Safety does not control the network, it will never achieve its goal of unrestricted priority access to broadband wireless, supported by a public safety grade (bulletproof) network infrastructure. One way to address the FirstNet Dilemma is for FirstNet to petition the FCC to issue an Order that would require all new 700MHz. broadband wireless subscriber devices be capable of accessing FirstNet spectrum (Band 14). This single regulatory action would create an immediate market for FirstNet spectrum, even in the absence of a deployed network. By creating an environment that ensures that band 14 capable devices become ubiquitous, the FCC Order would increase the value of FirstNet spectrum to potential lessees, enabling FirstNet to generate a revenue stream prior to the deployment of the NPSBN simply by leasing the spectrum until the NPSBN is ready to deploy in a given locale. In addition, the FCC Order would ensure the availability of band 14 devices and substantially lower their cost to public safety users when the NPSBN is deployed. Every day that FirstNet spectrum lays fallow is a lost opportunity to generate revenue that could help fund NPSBN construction, deployment and ongoing operating expenses. Once the NPSBN is deployed, FirstNet (or the designated local network operator) could continue to lease excess NPSBN capacity to secondary users through a public private partnership, thus reducing public safety user recurring user recurring monthly fees to a level far below commercial market rates, whilst encouraging public safety network participation and discouraging potential competitors.	Thank you for your comment.
12/31/2014	Email	Patricia A. Gilman, Ph.D., RPA	University of Arizona	Cultural / Historic resources	Ms. Pereira, I am writing in support of the idea that FirstNet use the existing antenna pads on Tumamoc Hill in Tucson. The entire top and sides of the hill are an archaeological site that is very important in the history of Tucson. It has hundreds of rock-ringed houses that are about 2000 years old along with petroglyphs and a very early community building. For an archaeologist like me, it is a very cool site because it has told us about the lives of people living at this time in the Tucson Basin. The site is unique, by the way. There are no others like it, which suggests its importance. Most of the site has not been excavated, and so there is much more we could learn here. But the most important thing is to preserve the site for the future so that others, both the public and archaeologists, can appreciate the lives of these people. Please do the right thing for the history of Tucson and use only the existing antenna pads. That way, everyone gets what they want and need. Thank you for you attention to this. Patricia A. Gilman, Ph.D., RPA	FirstNet does not yet have a network design, however we will work to avoid adverse impacts to sensitive resources wherever possible. Once specific projects are identified, FirstNet will work with the appropriate federal, state, and local agencies, and federally-recognized Indian tribes, to comply with all requirements.
1/1/2015	Email	Paul Mirocha	Public	Aesthetics / Recreational Use	Dear Amanda, Mike Rosenzweig, my boss at Tumamoc: People and Habitats, asked me to comment on my perspective on Tumamoc Hill. I have been artist-in-residence there since 2011. You can see a more of what I've done there on my blog: http://TumamocSketchbook.com.	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Geology	What is Tumamoc Hill? It's a highly protected natural wild-lands Sonoran Desert mountain, National Historic Landmark, ecological research preserve, U.S. Archaeological District, and community icon—all of two miles from downtown and surrounded by growing urban Tucson. But there is no single description of Tumamoc Hill that is complete. There are many layers to the place, with different meanings depending on who you are talking to. A geologist will tell you that Tumamoc is an inselberg of volcanic rock remaining from eruptions between 20 – 30 million years ago. And it originally was formed near what is now the Santa Catalina Mountains.	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Cultural / Historic resources	A paleontologist will tell you that the current Sonoran Desert environment came about 8–15 million years ago during a drying trend, when the unique desert plants here evolved from tropical ancestors moving north from Mexico. The Tohono O'odham call it Cemamagĭ Doag, "Horned Lizard Mountain." The Hill is considered a sacred ancestral site for O'odham, Yaqui, and Hopi Indians.	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Infrastructure	The summit is now a site for a number of communications and homeland security communications towers, yet this role has probably been played for thousands of years. We know that up until historic times, Sentinal Peak, Tumamoc's sister peak was used, for it's broad view of the valley, as a lookout post, especially for marauding Apaches.	Thank you for your comment.

Date Rec'd	Format	Name	Organization	Topic	Comment	Response
1/1/2015	Email	Paul Mirocha	Public	Cultural / Historic resources	It has been called many names. Lawrence Clark Powell, famed librarian and writer who lived in Tucson, called Tumamoc "Tucson's Acropolis." It's been called by various names, including "A Mecca for botanists, and "The Jerusalem of desert rats."	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Biological Resources	The first thing a modern ecologist will say to you is "don't stray off the road." Beginning with the establishment of the Desert Botanical Laboratory in 1903 by the Carnegie Institution of Washington, Tumamoc is the oldest continually monitored ecological research preserve in the world, with data from over 100 years of study. This is the world's first restoration ecology project. The nature here is to look at, to study, to appreciate, but not to exploit–not even to use.	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Cultural / Historic resources	To an archeologist, Tumamoc is a mystery that would challenge even Sherlock Holmes. Ruins of cultures living on Tumamoc go back 3,500 years, and at various times in prehistory, the Tumamoc hilltop was probably an important landmark, cultural focal point, and ceremonial ground.	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Aesthetics / Recreational Use	To the thousands of people who walk the road daily (only authorized vehicles are allowed) Tumamoc is the best workout in town, a treadmill with a spectacular view. It's a source of healing and health. It's a place where one can stroll among grazing deer five minutes from downtown. Dig a little deeper and many walkers will confide that Tumamoc is a very personal emotional or spiritual sanctuary.	Thank you for your comment.
1/1/2015	Email	Paul Mirocha	Public	Cultural / Historic resources	Urban culture and ecological research can co-exist on Tumamoc Hill. It is a sanctuary for humans as well as other Sonoran Desert life forms, but the boundaries are clear: no one steps off the road without special permission. Scientists have protected the Hill for the last century. Now it's up to the community to take part in stewardship of the Hill as a special place and a cultural value for the next 100 years. At that time, we'll check in again and see how it's going. In the mean time I urge Firstnet to join the other institutions, groups, and governmental entities that are united as part of the stewardship of this valuable site. best regards, Paul Mirocha	Thank you for your comment.
1/3/2015	Email	Marc Severson	Public	Cultural / Historic resources	Dear Ms. Periera, I am writing to urge you to protect the cultural resources on the top of Tumamoc Hill in Tucson. This historic/prehistoric site has unique constructions that give insight into the prehistory of the Southwest. Further constructions endangers these resources. There are archaeological resources on and around this site that are irreplaceable. Considerable damage has already occurred over the years. I urge you to limit construction on this site to areas that have been previously disturbed and allow no further destruction of these resources. Thank you, Marc Severson	Thank you for your comment.
1/6/2015	Email	Matt Goode	University of Arizona	Biological Resources	Dear Ms. Pereira, I am a Research Scientist at the University of Arizona and my lab is situated on Tumamoc Hill. I am writing to let you know how important Tumamoc Hill is to me and my students, as well as the community of Tucson. I have been conducting research on reptiles on Tumamoc for the past three years. Besides providing us with an incredible opportunity to better understand how reptiles persist in fragmented habitats, Tumamoc also enables us to provide unprecedented opportunities to educate the general public about scientific research and conservation of natural resources. Your help in keeping Tumamoc Hill healthy and productive is greatly appreciated by a lot of diverse stakeholders who care about Tucson's history and it's future! Thank you so much for your support! Matt	Thank you for your comment.

APPENDIX C – ENVIRONMENTAL LAWS AND REGULATIONS

The proposed implementation of the Proposed Action must meet the requirements of the National Environmental Policy Act and other applicable federal laws and regulations, Executive Orders, and implementing guidance for the resource areas evaluated in the Programmatic Environmental Impact Statement. Titles are listed alphabetically.

Table C-1: Applicable Laws and Regulations, Executive Orders, and Guidance

Title	Description
Laws and Regulations	
American Indian Religious Freedom Act (AIRFA) (42 United States Code [U.S.C.] §1996)	Protects and preserves for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Alaska Native, and Native Hawaiians, including access to culturally significant sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.
Archaeological Resources Protection Act of 1979 (ARPA) (16 U.S.C. §§470aa-470mm; Public Law [Pub. L] 96-95)	Establishes requirements to protect archaeological resources and sites on public lands and Indian lands, including civil and criminal penalties for the destruction or alteration of cultural resources.
Bald and Golden Eagle Protection Act (16 U.S.C. §668 et seq.)	Prohibits the taking, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export, or import of any part of a bald eagle or golden eagle.
Clean Air Act (CAA) (42 U.S.C. §§7401-7671g)	Protects air quality; authorizes the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards for six criteria pollutants that threaten human health and welfare: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), and particulate matter with a diameter equal to or less than 10 microns (PM_{10}) or less than 2.5 microns (fine particles) ($PM_{2.5}$). Includes provisions for reducing soil erosion to preserve air quality.
Coastal Barrier Improvement Act of 1990 (CBIA) (Pub. L., 101-591)	Adds additional areas to the Coastal Barrier Resources System and secondary barriers within large embayments (coastline indentations that form a bay), and establishes a process to transfer interests in land to public or non-profit conservation organizations.
Coastal Barrier Resources Act of 1982 (CBRA) (Pub. L. 97–348)	Established the John H Chafee Coastal Barrier Resource System to protect sensitive and vulnerable barrier islands found along the U.S. Atlantic, Gulf, and Great Lakes coastlines, as well as Puerto Rico and the U.S. Virgin Islands.
Coastal Zone Management Act (CZMA) (16 U.S.C. § 1451 et seq.)	Enacted to protect the coastal environment from growing demands associated with residential, recreational, commercial and industrial uses. Coastal states with an approved Coastal Zone Management Plan identifying permissible land and water use within the state's coastal zone can review federal actions for federal consistency to determine if the actions are consistent with the state program's enforceable policies.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA - Superfund Law) (42 U.S.C. §9601)	Authorizes the USEPA to respond to releases, or threatened releases, of hazardous substances that may endanger public health, welfare, or the environment. Requires the USEPA to establish criteria for determining priorities among releases (or threatened releases) of hazardous substances for the purpose of taking remedial action.
Construction, Marking, and Lighting of Antenna Structures of	Governs communications infrastructure under Part 17, which prescribes procedures for antenna structure registration and requires the Federal Aviation Administration (FAA) to conduct an aeronautical study of the

Title	Description
the Federal Communications Commission regulations, Part 17 (47 Code of Federal Regulations [CFR] Chapter 1)	navigation airspace to determine appropriate tower marking and lighting requirements for safe airspace. Before the Federal Communications Commission authorizes the construction of new antennae or alteration of existing antennae structures, an FAA determination of "no hazard" may be required. FAA notification is required for new any construction greater than 200 feet above the ground, and near an airport runway (taller than 100:1 for a horizontal distance of 20,000 feet, 50:1 for a horizontal distance of 10,000 feet, and 25:1 for a horizontal distance of 5,000 feet of a heliport). The FAA can vary marking and lighting when requested if aviation safety is not compromised.
Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508)	Provides direction to ensure compliance with procedures to achieve the goals of NEPA. Public officials are able to make decisions based on understanding of environmental consequences and take actions to protect, restore, and enhance the environment.
Critical Infrastructure Protection Act of 2001 (42 U.S.C. 5195)	Defines critical infrastructure as the assets, systems, and networks (physical or virtual) vital to the U.S., which if incapacitated or destroyed, would have a debilitating effect on security, national economic security, public health or safety, or a combination of these.
Disaster Mitigation Act of 2000 (DMA 2000) (Pub. L. 106-390)	Establishes the basis for Federal Environmental Management Agency disaster mitigation planning requirements as a condition of mitigation grant assistance to states, tribes, and local governments. Mitigation planning may be incorporated into a comprehensive master plan identifying hazards, analyzing risks, establishing priorities, and describing specific actions to address those risks.
Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. §§11004-11049)	Improves community access to information about chemical hazards and facilitates the development of chemical emergency response plans by states, tribes, and local governments. Establishes the Toxic Release Inventory to inform the public about potentially dangerous chemicals in their community.
Endangered Species Act (ESA) of 1973 (16 U.S.C. §1531 et seq.)	Ensures the protection and recovery of imperiled species and the habitats upon which they depend. Prohibits take, which is defined as harming, up to and including killing, or harassing a listed species. Section 7 of the ESA requires federal agencies to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the threatened or endangered species or result in destruction or adverse modification of critical habitat.
Energy Independence and Security Act of 2007 (Pub. L. 110-140)	Expands the production of renewable fuels and contains provisions for energy efficiency, smart grid, and carbon dioxide and incentives for plug-in hybrid electric vehicles to assist the electric power industry's efforts to reduce greenhouse gas emissions.
Energy Policy Act of 2005 (Pub. L. 109-58)	Provides tax incentives and loan guarantees for energy production of various types.
Farmland Protection Policy Act of 1981 (FPPA) (Pub. L. 97–98, 7 U.S.C. §4201)	Requires federal agencies to examine the potentially adverse effects to "prime" and "unique" farmland resources before approving any action that would irreversibly convert farmlands to non-farm uses.
Federal Facility Compliance Act of 1992 (Pub. L. 102–386)	Amends the Solid Waste Disposal Act and expands the enforcement authority of federal and state regulators with respect to solid and hazardous waste management at federal facilities. Requires federal facilities to pay any nondiscriminatory fees or service charges assessed in connection with a federal, state, interstate, or local solid or hazardous waste regulatory program. Waives immunity for federal facilities under solid and hazardous waste laws by allowing states to fine and penalize for violations.

Title	Description
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. §136 et seq.)	Provides for federal regulation of pesticide distribution, sale, and use.
Federal Land Policy and Management Act of 1976 (43 U.S.C. §1701 et seq.)	Directs management of public lands, administered by the Bureau of Land Management, to protect the quality of the land and preserve certain public lands in their natural conditions.
Federal Telecommunications Act of 1996	Establishes general criteria for the siting of telecommunication facilities.
Federal Water Pollution Control Act (Clean Water Act – CWA) (33 U.S.C. §1251 et seq.)	Protects water quality and aims to restore and maintain the chemical, physical, and biological integrity of "waters of the United States." Section 303(d) requires states and USEPA to identify waters not meeting state water quality standards and to develop total maximum daily loads, defined as the maximum amount of a pollutant a waterbody can receive and still meet water quality standards. After determining total maximum daily loads for impaired waters, states are required to identify all point and nonpoint sources (runoff) of pollution in a watershed that are contributing to the impairment and to develop an implementation plan that will allocate reductions to each source in order to meet the state standards. Section 320 establishes the National Estuary Program, which identifies nationally significant estuaries threatened by pollution, and requires federal grants to states, interstate, and regional water pollution control agencies to prepare and implement conservation and management plans. Section 404 addresses prohibition and permitting for dredged materials and fill material into waters of the United States.
Fish and Wildlife Conservation Act of 1980 (16 U.S.C. §§2901-2911)	Declares that fish and wildlife are of ecological, educational, aesthetic, cultural, recreational, economic, and scientific value to the nation, and encourages all federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats.
Fish and Wildlife Coordination Act of 1934 (16 U.S.C. §§661-667e)	Mandates that fish and wildlife resources receive adequate and equal consideration in conjunction with other values during the planning of water resources development projects that may conflict with the goal of conserving fish and wildlife resources.
Flood Plain Management Criteria for Flood-prone Areas (44 CFR Part 60.3)	Provides guidance on Federal Emergency Management Agency floodplain management criteria for land management and use.
Intermodal Surface Transportation Efficiency Act of 1991 (23 U.S.C. §101 [note])	Establishes new U.S. transportation planning and policy for highway construction, highway safety, and mass transit funding. Provides funds for the Bridge Replacement and Rehabilitation Program, Scenic Byways Program, pedestrian and bicycle facilities (such as pedestrian bridges), and designation of high-speed rail corridors.
Landownership Adjustments (36 CFR Part 254)	Sets procedures for conducting exchanges of National Forest System lands and requires consideration of the public interest, including protection of fish and wildlife habitats, cultural resources, watersheds, and wilderness and aesthetic values, as well as enhancement of recreation opportunities and public access.
Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. §§1801-1882)	Requires conservation and management of U.S. fishery resources through implementation of fishery management plans and Regional Fishery Management Councils. Fishery management plans enable stakeholders to participate in the administration of fisheries, consider social and economic needs of states, develop underutilized fisheries, and protect essential fish habitats.
Marine Mammal Protection Act of 1972 (MMPA)	Prohibits the taking of marine mammals and enacts moratoriums on imports, exports, and sales of marine mammals and marine mammal parts or products within the United States. Defines "take" as "the act of

Title	Description
	hunting, killing, capture, and/or harassment of any marine mammal; or, the attempt at such." Defines "harassment" as "any act of pursuit, torment or annoyance" that has potential to injure or disturb a marine mammal.
Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. §§1401–1445)	Establishes the marine sanctuaries program and provides a permitting process for the dumping of materials, including dredged materials, into U.S. ocean water.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§703-712)	Regulates the taking, possession, import, export, transport, sale, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit.
National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.)	Requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their Proposed Actions and reasonable alternatives to those actions. Established CEQ; CEQ promulgated regulations implementing NEPA, which are binding on all federal agencies, to address the procedural provisions of NEPA and the administration of the NEPA process, including preparation of Environmental Impact Statements.
National Forest Management Act of 1976 (Pub. L. 94-588) National Forest System Land and Resource Management Planning (36 CFR Part 219)	Governs the administration of national forests and removal of trees. Includes requirements for consideration, treatment, and protection of intangible resources such as scenery and aesthetics.
National Historic Preservation Act (NHPA) (formerly 16 U.S.C. § 470 et seq., now 54 U.S.C. § 100101 et seq.)	Ensures protection of cultural resources and historic properties. Established the Advisory Council on Historic Preservation (ACHP) to promote the preservation, enhancement, and productive use of our nation's historic resources. Authorizes the Secretary of the Interior to maintain a National Register of Historic Places composed of districts, sites, buildings, structures, and objects significant in American history and culture. Section 106 of the NHPA requires federal agencies to identify the effects of proposed actions on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. Under Section 106, the NHPA requires that federal agencies consult with federally-recognized Indian tribes and Native Hawaiian Organizations that attach traditional religious and cultural significance to eligible or listed historic properties that may be affected by the agency's actions.
National Marine Sanctuaries Act (16 U.S.C. §1431 et seq.)	Authorizes the Secretary of Commerce to designate national marine sanctuaries based on statutory criteria and specifies consultation requirements.
National Trails System Act of 1968 (16 U.S.C. §1241)	Authorizes the Secretary of Agriculture to administer and manage national scenic trails for conservation and enjoyment.
Native American Graves Protection and Repatriation Act (NAGPRA) (Pub. L. 101–601, 104 Stat. 3048)	Establishes a process for museums and federal agencies to manage certain Native American cultural items in their possession or inadvertently discovered during a project; establishes the rights of Native American lineal descendants, American Indian tribes, and Native Hawaiian organizations with respect to the treatment, repatriation, and disposition of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony (referred to collectively in the statute as cultural items), with which they can show a relationship of lineal descent or cultural affiliation.
North American Wetlands Conservation Act of 1989 (Pub. L. 101-233)	Recognizes the aesthetic values of fish, shellfish, and other wildlife, and recognizes that wetlands provide aquatic areas important for recreational and aesthetic purposes. Federal agencies (to the extent possible) should cooperate to restore, protect, and enhance wetlands and other habitats for migratory birds, fish, and wildlife.

Title	Description
Occupational Safety and Health Act (OSHA) of 1970 (Pub. L. 91-596)	Mandates that employers provide a safe place of employment, free from hazards to safety and health.
Plant Protection Act (7 U.S.C. §7701 et seq.)	Establishes a program to control the spread of noxious weeds.
Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772)	Establishes procedures for conducting noise studies and implementing noise abatement measures, and provides guidelines to plan and design highway projects.
Resource Conservation and Recovery Act of 1976 (40 CFR Parts 239-282)	Amends the Solid Waste Disposal Act of 1965 to address how to safely manage and dispose of municipal and industrial waste generated nationwide. Identifies more stringent hazardous waste management standards, and a comprehensive regulatory program for underground storage tanks that store petroleum or certain hazardous materials.
Rivers and Harbors Act of 1899 (33 U.S.C. §403)	Addresses projects and activities in navigable waters and harbor and river improvements and prohibits the unauthorized obstruction or alteration of any navigable water of the United States, including altering any port, harbor, or channel.
Safe Drinking Water Act (42 U.S.C. §§300d-300j-9, *as amended by* Pub. L. 93-523)	Protects public health by regulating the nation's public drinking water and its sources, including protection of surface water and groundwater. Section 1424(e) of the Safe Drinking Water Act authorizes the Sole Source Aquifer Protection Program. Sole source aquifers are the sole or principal source of drinking water for an area, defined as providing 50 percent or more an area's drinking water supply. Any federally funded proposed project with the potential to contaminate a designated sole source aquifer is subject to USEPA review.
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (Pub. L. 109–59)	Addresses maintenance and growth challenges of the U.S. transportation system (e.g., improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment). Regulates efforts to address national transportation problems and provides state and local decision makers the flexibility to solve transportation problems at the regional and local levels.
Superfund Amendments and Reauthorization Act of 1986 (SARA) (Pub. L. 99-499)	Amends the Comprehensive Environmental Response, Compensation, and Liability Act as a result of lessons learned from managing the Superfund program. Stresses the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites, encourages greater citizen participation in cleanup decisions, and increases the size of the trust fund.
Toxic Substances Control Act of 1976 (TSCA) (15 U.S.C. Chapter 53)	Gives the USEPA the authority to require reporting, record-keeping, and testing relating to toxic chemical substances or mixtures.
Wild and Scenic Rivers Act (16 U.S.C. §§1271–1287) Wild and Scenic Rivers (36 CFR Part 297)	Provides for a Wild and Scenic River System by recognizing the remarkable values (scenic, recreational, geologic, fish and wildlife, historic, cultural, or other values) of specific rivers of the United States. The Wild and Scenic Rivers designation includes requirements for the protection of scenic and natural values from the effects of any water resources project.
Wilderness Act of 1964 (16 U.S.C. §1131)	Provides for the preservation of wilderness character and protects and manages the natural conditions of wilderness areas to negate the impact of humankind.
Executive Orders	
Executive Order 11988 Floodplain Management	Requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

Title	Description
Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	Ensures that federal agencies avoid taking actions that have a disproportionately high and adverse impact on low-income populations or minority populations. Emphasizes the importance of NEPA's public participation process, directing that each federal agency shall provide opportunities for community input in the NEPA process.
Executive Order 13007 Indian Sacred Sites	Directs federal agencies to accommodate access to and avoid adversely affecting American Indian sacred sites.
Executive Order 13089 Coral Reef Protection	Directs federal agencies to avoid degradation of coral reef ecosystems and implement measures to restore affected ecosystems.
Executive Order 13112 Invasive Species	Directs federal agencies to prevent the introduction of plant, animal, and microorganism invasive species, and control and minimize the economic, ecologic, and human health impacts that invasive species may cause.
Executive Order 13340 Great Lakes Interagency Task Force and Promotion of a Regional Collaboration of National Significance for the Great Lakes	Specifies 11 federal agency and Cabinet-level departments to provide strategic direction on federal Great Lakes policies, priorities, and programs.
Executive Order 13547 Stewardship of the Ocean, Our Coasts, and the Great Lakes	Provides national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources.
Executive Order 13653 Preparing the United States for the Impacts of Climate Change	Directs federal agencies to take steps that will make it easier for American communities to strengthen their resilience to climate change impacts.
Executive Order 13690 Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input	Implements the Federal Flood Risk Management Standard as part of a national policy on resilience and risk reduction, consistent with the President’s Climate Action Plan. Amends EO 11988, and emphasizes consideration by agencies of ecosystem-based alternatives and long-term resilience and risk reduction when managing flood risks.
Executive Order 13693 Planning for Federal Sustainability in the Next Decade	Establishes target of 40 percent greenhouse gas emission reduction for federal operations by 2025, relative to a fiscal year 2008 baseline. Primary emphasis is on increasing energy efficiency before considering renewable energy and alternative fuels. Federal agencies will continue to prepare annual Strategic Sustainability Performance Plans for Council on Environmental Quality review.
Guidance	
Council on Environmental Quality Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions	Provides guidance on how to incorporate the environmental effects of greenhouse gas emissions and the relationship of climate change in NEPA documentation.

APPENDIX D – ENVIRONMENTAL JUSTICE METHODOLOGY

FirstNet Methodology to Screen for Potential Environmental Justice Populations

This appendix explains the methodology used in this Programmatic Environmental Impact Statement (PEIS) to screen for the presence of potential environmental justice populations. The PEIS applies this methodology to every state and territory. Future analyses for site-specific actions may tier-off the results and methodology of this PEIS (see Section 1.2).

The first step in developing a screening methodology is to determine the types of communities that are relevant. The Council on Environmental Quality (CEQ) defines both place-based and non-place based communities for environmental justice consideration. Specifically, "agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect." (CEQ, 1997)

Telecommunications projects could have effects on place-based minority or low-income populations, meaning populations of individuals "living in geographic proximity" to one another and to an action such as placement of a telecommunications tower. Potentially, such projects could affect place-based environmental justice communities disproportionately due to localized human health or environmental effects. (The focus in environmental justice assessments is always on adverse effects, but telecommunications projects could also have beneficial effects such as improvements in police, fire, and emergency medical services. The Environmental Consequences section for infrastructure addresses such effects.) Telecommunications projects would be very unlikely to affect disproportionately any populations that are not place-based. Because FirstNet is such a broad program, it would affect at the same rate and intensity the general population and groups not defined by where they live, such as migrant workers, other types of workers that disproportionately fall into particular minority categories, racial and ethnic groups in general, and Native American Tribes as dispersed entities.

Identifying potential place-based environmental justice communities involves screening geographic areas for minority and low-income populations. This requires choosing the appropriate geographic units of analysis, the appropriate general population comparison group, and the appropriate metrics for classifying populations according to the CEQ definitions. The following paragraphs address each consideration in turn.

Any adverse effects of FirstNet projects are most likely to manifest at a local level. For example, dust and noise exposure from construction of communication towers, changes in property values, and any adverse radiation from operation of communications equipment – should these be actual impacts – would affect people in proximity to those activities. Therefore, the environmental justice population screening analysis in this PEIS uses the smallest geographic unit for which regularly updated socioeconomic data are readily available, the census block group (BG).

The Census Bureau defines this unit as follows.

> "Block Groups are statistical divisions of census tracts, [and] are generally defined to contain between 600 and 3,000 people. … A BG usually covers a contiguous area. … BGs never cross state, county, or census tract boundaries but may cross the boundaries of any other geographic entity." (U.S. Census Bureau, 2015a)

In dense inner city areas, a BG may only encompass a few city blocks. In rural areas, a BG may cover many square miles.

Regarding the choice of general population comparison group, this PEIS uses each state's population as the comparison group, hereafter called the reference population. This is because: a) states are the fundamental analysis units for the PEIS as a whole, and b) states vary considerably in their demographic and economic conditions, thus it would not be appropriate to compare BG figures to national figures on population by minority group or poverty status.

The choice of appropriate metrics for identifying minority populations and low-income populations is somewhat complicated. The CEQ provides some basic guidance. Additional aspects are discretionary and are matters of precedent and best practice within particular agencies and among socioeconomic analysts.

The CEQ provides the following direction on minority populations:

> "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." (CEQ, 1997)

The CEQ does not define "meaningfully greater." In practice, many analysts use varying percentages above the reference population's percentage of individual minority groups (e.g., Asian or Hispanic) or combined minority groups.

The CEQ also directs that "Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty" (CEQ, 1997). Poverty thresholds are specific income levels that take into account factors such as family size and the ages of family members. The federal government defines these levels annually for the nation. The CEQ does not provide additional direction on applying poverty thresholds. In practice, many analysts use varying percentages above the reference population's percentage of people with incomes at or below the poverty level.

Minority and low-income populations are each of concern in environmental justice assessments. If a block group meets either the minority criteria or the low-income criteria, it is considered a potential environmental justice population.

This PEIS uses several different criteria (thresholds) in a screening methodology designed to identify degrees of likelihood that a BG contains a potential environmental justice population. These thresholds are:

a) An absolute threshold of over 50 percent of the BG's population being of minority status. This is a CEQ-defined threshold as noted above (CEQ, 1997).

b) An absolute threshold of 20 percent or more of the BG's population living in poverty. This is the Census Bureau's definition of a "poverty area" (Bishaw, 2014).

c) A meaningfully greater threshold of 20 percentage points greater than the reference population's minority population, whether an individual minority population or combined minority population. For example, if the combined minority population in the reference population is 10 percent, the threshold applied to each BG is 30 percent. This is the U.S. Department of Housing and Urban Development's definition of a "minority neighborhood" (U.S. Department of Housing and Urban Development, 2015). An example of a recent, multi-state PEIS that used this threshold is the *Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States* (U.S. Bureau of Land Management 2012). Its *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States* (U.S. Bureau of Land Management and U.S. Department of Energy 2010) provides the environmental justice screening analysis (see Chapter 4, Affected Environment, and the individual state affected environment and impact assessment chapters).

d) A meaningfully greater threshold of 120 percent of the reference population's minority population (individual minority or combined minority population). For example, if the minority population in the reference population is 10 percent, the threshold applied to each BG is 12 percent. However, using this as the sole criterion at the BG level would be problematic because it may mis-identify the environmental justice potential of many BGs.[1]

e) A meaningfully greater threshold of 120 percent of the reference population's percentage of individuals living with incomes below 200 percent of the federal poverty level. For example, if 25 percent of the reference population is below 200 percent of the poverty level, the threshold applied to each BG is 30 percent. This approach aligns with the U.S. Environmental Protection Agency's (USEPA) approach to defining "low income" in its recently released environmental justice screening tool, EJSCREEN. EPA's rationale for this threshold cites literature indicating that the "effects of income on baseline health and probably on other aspects of susceptibility are not limited to those [people] below the poverty thresholds," and the view of some socioeconomic analysts that "today's poverty thresholds are too low to adequately capture the populations adversely affected by low income levels." (USEPA, 2015c) However, this definition broadens the definition of low-income provided

[1] For instance, if the reference population percentage for a specific minority is 1 percent, the threshold for defining a potential environmental justice population is 1.2 percent. If a BG has a total population of 1,000, the specific minority population equivalent to the reference population percentage is 10, and the threshold for defining an environmental justice population is 12. The difference of only two persons categorizes this BG as a potential environmental justice population. This is a questionable conclusion in terms of data fidelity (census and sampling errors), and whether such small differences truly are meaningful in the environmental justice context. The 120 percent approach to "meaningfully greater" can lead to identifying many BGs as potential environmental justice populations based on very small differences, and where the individuals do not constitute a community according to the CEQ definition noted above—"a group of individuals living in geographic proximity to one another." Therefore, this EIS uses this threshold to identify moderate potential for environmental justice populations, and other, higher thresholds to identify high potential for environmental justice populations.

by the CEQ (CEQ, 1997) and considerably increases the number of BGs identified as having environmental justice potential.

For this PEIS, combinations of these thresholds define three degrees of likelihood that a BG contains a potential environmental justice population:

High Potential for Environmental Justice Populations:

- Greater than 50% combined minority population
- Or greater than 20% of the total population living in poverty
- Or greater than the reference percentage plus 20 percentage points for at least one minority population
- Or greater than 120% of the reference percentage for combined minority population

Moderate Potential for Environmental Justice Populations

- Does not meet any of the above thresholds
- And greater than 120% of the reference percentage for at least one minority population
- Or greater than 120% of the reference percentage for individuals living with incomes below 200 percent of the federal poverty level

Low Potential for Environmental Justice Populations

- Does not meet any of the above thresholds

The thresholds specific to the Moderate Potential category are much broader than those of the High Potential category. The Moderate Potential category casts a wide net – it was defined to err on the side of including an area as a potential environmental justice population. During FirstNet deployment, further analysis to verify the presence of specific, localized environmental justice populations would be particularly warranted for the Moderate Potential category.

This PEIS applies this methodology to all BGs in a state, using data from the Census Bureau's American Community Survey (ACS) 2009-2013 5-Year Estimates (U.S. Census Bureau 2015j, U.S. Census Bureau 2015k, U.S. Census Bureau 2015l, U.S. Census Bureau 2015n) and Census Bureau urban classification data (U.S. Census Bureau, 2010a; U.S. Census Bureau, 2010b). The ACS is the Census Bureau's flagship demographic estimates program for years between the decennial censuses. The 5-Year Estimates use sample data taken over a five-year period; this is the only nationally consistent source of the necessary data at the BG level.

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APPENDIX E – AIR QUALITY

Table E-1: National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	Primary Standard[a]		Secondary Standard		Notes
		µg/m³	ppm	µg/m³	ppm	
CO	8-hour	10,000	9	-	-	Standard is not to be exceeded more than once per year
	1-hour	40,000	35	-	-	
Lead	3-month	0.15[b]	-	Same as Primary		Rolling average. Not to be exceeded
NO_2	1-hour	188	0.100	-	-	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Annual	100	0.053	Same as Primary		Annual Mean
PM_{10}	24-hour	150	-	-	-	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$	Annual	12	-	15	-	Annual mean, averaged over 3 years
	24-hour	35	-	Same as Primary		98th percentile, averaged over 3 years
O_3	8-hour	140	0.070[c]	Same as Primary		Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
SO_2	1-hour	196	0.075[d]	-	-	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	3-hour	-	-	1,300	0.5	Not to be exceeded more than once per year

Source: (USEPA, 2014a)

[a] The standard may be expressed both sets of units. A bank cell, containing a dash, indicates that there is no primary or secondary standard for the specific pollutant and averaging time.

[b] "Final Rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[c] Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

[d] Final Rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved."

Table E-2: Federally Regulated Hazardous Air Pollutants (HAPs)

POLLUTANT[a]	CAS#
Acetaldehyde	75070
Acetamide	60355
Acetonitrile	75058
Acetophenone	98862
2-Acetylaminofluorene	53963
Acrolein	107028
Acrylamide	79061
Acrylic acid	79107
Acrylonitrile	107131
Allyl chloride	107051
4-Aminobiphenyl	92671
Aniline	62533
o-Anisidine	90040
Asbestos	1332214
Benzene (including benzene from gasoline)	71432
Benzidine	92875
Benzotrichloride	98077
Benzyl chloride	100447
Biphenyl	92524
Bis(2-ethylhexyl)phthalate (DEHP)	117817
Bis(chloromethyl)ether	542881
Bromoform	75252
1,3-Butadiene	106990
Calcium cyanamide	156627
Caprolactam	105602
Captan	133062
Carbaryl	63252
Carbon disulfide	75150
Carbon tetrachloride	56235
Carbonyl sulfide	463581
Catechol	120809
Chloramben	133904
Chlordane	57749
Chlorine	7782505
Chloroacetic acid	79118
2-Chloroacetophenone	532274
Chlorobenzene	108907
Chlorobenzilate	510156

POLLUTANT[a]	CAS#
Chloroform	67663
Chloromethyl methyl ether	107302
Chloroprene	126998
Cresols/Cresylic acid (isomers and mixture)	1319773
o-Cresol	95487
m-Cresol	108394
p-Cresol	106445
Cumene	98828
2,4-D, salts and esters	94757
DDE	3547044
Diazomethane	334883
Dibenzofurans	132649
1,2-Dibromo-3-chloropropane	96128
Dibutylphthalate	84742
1,4-Dichlorobenzene(p)	106467
3,3-Dichlorobenzidene	91941
Dichloroethyl ether (Bis(2-chloroethyl)ether)	111444
1,3-Dichloropropene	542756
Dichlorvos	62737
Diethanolamine	111422
N,N-Diethyl aniline (N,N-Dimethylaniline)	121697
Diethyl sulfate	64675
3,3-Dimethoxybenzidine	119904
Dimethyl aminoazobenzene	60117
3,3'-Dimethyl benzidine	119937
Dimethyl carbamoyl chloride	79447
Dimethyl formamide	68122
1,1-Dimethyl hydrazine	57147
Dimethyl phthalate	131113
Dimethyl sulfate	77781
4,6-Dinitro-o-cresol, and salts	534521
2,4-Dinitrophenol	51285
2,4-Dinitrotoluene	121142
1,4-Dioxane (1,4-Diethyleneoxide)	123911
1,2-Diphenylhydrazine	122667
Epichlorohydrin (l-Chloro-2,3-epoxypropane)	106898
1,2-Epoxybutane	106887

POLLUTANT[a]	CAS#
Ethyl acrylate	140885
Ethyl benzene	100414
Ethyl carbamate (Urethane)	51796
Ethyl chloride (Chloroethane)	75003
Ethylene dibromide (Dibromoethane)	106934
Ethylene dichloride (1,2-Dichloroethane)	107062
Ethylene glycol	107211
Ethylene imine (Aziridine)	151564
Ethylene oxide	75218
Ethylene thiourea	96457
Ethylidene dichloride (1,1-Dichloroethane)	75343
Formaldehyde	50000
Heptachlor	76448
Hexachlorobenzene	118741
Hexachlorobutadiene	87683
Hexachlorocyclopentadiene	77474
Hexachloroethane	67721
Hexamethylene-1,6-diisocyanate	822060
Hexamethylphosphoramide	680319
Hexane	110543
Hydrazine	302012
Hydrochloric acid	7647010
Hydrogen fluoride (Hydrofluoric acid)	7664393
Hydrogen sulfide	7783064
Hydroquinone	123319
Isophorone	78591
Lindane (all isomers)	58899
Maleic anhydride	108316
Methanol	67561
Methoxychlor	72435
Methyl bromide (Bromomethane)	74839
Methyl chloride (Chloromethane)	74873
Methyl chloroform (1,1,1-Trichloroethane)	71556
Methyl ethyl ketone (2-Butanone)	78933
Methyl hydrazine	60344
Methyl iodide (Iodomethane)	74884
Methyl isobutyl ketone (Hexone)	108101
Methyl isocyanate	624839
Methyl methacrylate	80626

POLLUTANT[a]	CAS#
Methyl tert butyl ether	1634044
4,4-Methylene bis(2-chloroaniline)	101144
Methylene chloride (Dichloromethane)	75092
Methylene diphenyl diisocyanate (MDI)	101688
4,4'¬-Methylenedianiline	101779
Naphthalene	91203
Nitrobenzene	98953
4-Nitrobiphenyl	92933
4-Nitrophenol	100027
2-Nitropropane	79469
N-Nitroso-N-methylurea	684935
N-Nitrosodimethylamine	62759
N-Nitrosomorpholine	59892
Parathion	56382
Pentachloronitrobenzene (Quintobenzene)	82688
Pentachlorophenol	87865
Phenol	108952
p-Phenylenediamine	106503
Phosgene	75445
Phosphine	7803512
Phosphorus	7723140
Phthalic anhydride	85449
Polychlorinated biphenyls (Aroclors)	1336363
1,3-Propane sultone	1120714
beta-Propiolactone	57578
Propionaldehyde	123386
Propoxur (Baygon)	114261
Propylene dichloride (1,2-Dichloropropane)	78875
Propylene oxide	75569
1,2-Propylenimine (2-Methyl aziridine)	75558
Quinoline	91225
Quinone	106514
Styrene	100425
Styrene oxide	96093
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016
1,1,2,2-Tetrachloroethane	79345
Tetrachloroethylene (Perchloroethylene)	127184
Titanium tetrachloride	7550450
Toluene	108883

POLLUTANT[a]	CAS#
2,4-Toluene diamine	95807
2,4-Toluene diisocyanate	584849
o-Toluidine	95534
Toxaphene (chlorinated camphene)	8001352
1,2,4-Trichlorobenzene	120821
1,1,2-Trichloroethane	79005
Trichloroethylene	79016
2,4,5-Trichlorophenol	95954
2,4,6-Trichlorophenol	88062
Triethylamine	121448
Trifluralin	1582098
2,2,4-Trimethylpentane	540841
Vinyl acetate	108054
Vinyl bromide	593602
Vinyl chloride	75014
Vinylidene chloride (1,1-Dichloroethylene)	75354
Xylenes (isomers and mixture)	1330207
o-Xylenes	95476
m-Xylenes	108383
p-Xylenes	106423
Antimony Compounds	-
Arsenic Compounds (inorganic including arsine)	-
Beryllium Compounds	-
Cadmium Compounds	-
Chromium Compounds	-
Cobalt Compounds	-
Coke Oven Emissions	-
Cyanide Compounds[b]	-
Glycol ethers[c]	-
Lead Compounds	-
Manganese Compounds	-
Mercury Compounds	-
Fine mineral fibers[d]	-
Nickel Compounds	-
Polycylic Organic Matter[e]	-
Radionuclides (including radon)[f]	-
Selenium Compounds	-

0

Source: (USEPA, 2013c)

[a] For all listings above which contain the word "compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.

[b] X'CN where X = H' or any other group where a formal dissociation may occur. For example KCN or $Ca(CN)_2$

[c] Includes mono- and di- ethers of ethylene glycol, diethylene glycol, and triethylene glycol R-(OCH2CH2)n -OR' where:
n = 1, 2, or 3;
R = alkyl C7 or less; or
R = phenyl or alkyl substituted phenyl;
R'= H or alkyl C7 or less; or
OR' consists of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate.

[d] Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.

[e] Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 º C.

[f] A type of atom which spontaneously undergoes radioactive decay

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