

Kino to DMP Transmission Line Project

CWG Questions and Responses		
No.	Question	Response
1	Our neighborhood would like more details about the design of the poles and lines for the project. Our neighborhood experienced a tornado in the 1990s that caused roofs to blow off and a power outage for days, and we've had microbursts. The neighbors are looking for info about the design in order to understand how climate change and the predicted increasingly intense storms will be anticipated in this project.	<p>TEP utilizes and meets National Electric Safety Code (NESC) requirements for transmission line design, taking into consideration line tension, wind speed, gravity, and temperature.</p> <p>In 2011, TEP analyzed 50 years of wind data and determined that the minimum NESC requirements exceed Tucson's historical wind speeds, validating company standards and design criteria. TEP determined that we can accommodate over a 20 mph wind speed increase to historical Tucson wind speeds before the structure integrity is compromised.</p> <p>National code requirements established by the NESC will evolve with storms accordingly based upon the latest research and weather data accumulated. The NESC is updated every 4 years.</p>
2	<p>We also have concerns about the risk of fires like California is experiencing.</p> <p>Do TEP poles experience Corona Discharge, Is there a related fire risk?</p>	<p>As transmission operators, TEP is required to follow federal regulatory guidelines and maintain an active vegetation management program in order to minimize potential fire dangers. Throughout the year, we ensure that vegetation does not encroach on transmission line routes.</p> <p>Aerial (helicopter) inspections are conducted twice a year with visual evaluation. We also inspect about 20 percent of our transmission lines every year from the ground. TEP designs transmission lines to maintain NESC clearances from existing structures, such as homes, street lights, trees, etc.</p> <p>Wood poles in fire susceptible areas are treated with fire resistant coating.</p> <p>Transmission poles themselves are not part of Corona discharge. Corona discharge (can be visible as a glow) occurs when the air around an object becomes ionized. For transmission lines, corona can occur as a result of discontinuity in the conductor or hardware. An example would be a deep scratch on the conductor surface which can create corona.</p>
3	TEP has stated that the need for new transmission lines is to "support University of Arizona and Banner University Medical Center" and "strengthen reliability [for] TEP customers in or near the study area." What percentage of cost does each of these two categories contribute?	<p>New transmission lines are needed to ensure that TEP can continue to provide reliable electric service to current and future residential and commercial customers in central Tucson, including the University of Arizona, Banner University Medical Center and multiple neighborhoods throughout the area.</p> <p>TEP's service costs are allocated across all customer classes. TEP's rates are determined by the ACC in a public process that occurs after expenditures are incurred in a given test year. As such, the percentage of costs incurred by various classes cannot be determined at this time.</p>
4	What is the vision and timeline for the completed "loop" in the TEP service area?	The "loop" discussed in previous meetings refers to the completion of the 138 kV line interconnecting Kino Substation to the DeMoss-Petrie Substation, which would provide redundancy and improve reliability by allowing TEP to deliver energy from more than one direction to area customers. The scheduled in-service date for this portion of the loop is May 2023.
5	Our service is designed on different steps in voltage supply than Phoenix. Why?	Different utilities developed their systems based on different parameters. TEP's system was largely developed initially with 46kV as its upper voltage for transmitting power throughout Tucson. 46kV is then usually stepped up to 138kV when additional capacity is required. The Phoenix area developed initially with 69kV as a typical system voltage. This voltage then typically steps up to 230kV.
6	Why are some 46 kV lines left off the TEP maps?	TEP is updating maps to include the 46kV system.
7	When new transmission lines are installed, will the old poles be removed?	In some instances, if a new transmission line is replacing an existing one, the old poles will be removed. If a new transmission line is being constructed near existing distribution lines, the old poles carrying the distribution lines may remain. Additionally, in some cases, a section of a new transmission line could be attached to existing transmission poles in what's called a 'double circuit' configuration. In TEP's final application to the ACC for approval of the new line, the company will identify poles and other equipment that would be removed.
8	When will our current rates go up?	TEP's rates must be reviewed and approved in a public process before the Arizona Corporation Commission. Information about TEP's current application for new rates can be found at tep.com. Any increase in rates related to the proposed 138kV line will not be effective until the line has been constructed.
9	We have been told that some facilities are 80 years old. Is it unusual for a substation to go 80 years without improvements?	TEP continually inspects, maintains and installs upgrades to our local electric system, which must be designed and built to withstand the rigors of summer heat, monsoon thunderstorms and other inclement weather while providing safe, reliable service to customers. While maintenance and repair is necessary, some facilities can operate for an extended period of time as designed without requiring replacement.
10	What has been the timeline of major improvements from 1940 to present, and how does that timeline match rate hikes? How does it correspond to returns on investments for stakeholders?	<p>TEP provides service to more than 425,000 customers with a modern electrical grid that spans 1,155 square miles and includes approximately 5,100 miles of transmission and distribution lines, more than 4,300 cable-miles of underground distribution lines, nearly 100,000 power poles and transmission structures and more than 100 substations.</p> <p>Developing a detailed 80-year timeline as described would be difficult. TEP's rate of return is determined through a public rate-making process before the Arizona Corporation Commission.</p> <p>Since 2015 alone, system investments include:</p> <ul style="list-style-type: none"> \$343 million of upgrades to TEP's distribution system, which delivers electric service to customers' homes and businesses. This work includes building and upgrading substations, power lines and power poles throughout TEP's service territory. \$149 million in improvements to TEP's transmission system. \$444 million in upgrades for TEP's existing generating resources.
11	What percentage of the TEP service area is underground?	<p>Transmission (> 138kV) - 0%</p> <p>Subtransmission (46kV) - 2%</p> <p>Distribution (4.16-13.8 kV) - 64%</p>

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12	Where has TEP buried lines?	TEP maintains underground facilities throughout its territory. In many new housing communities, electric distribution service is delivered through buried service lines. TEP and the developer collaborate to cover the costs of underground facilities.
13	Would TEP object to a plan to bury the new lines under Park Avenue and make that congested street exclusive to bikes, streetcars and pedestrians?	TEP would not object to such a plan by the City and affected neighborhoods as long as incremental costs for underground facilities are considered during development.
14	TEP has stated that the cost differential (overhead to underground) would be \$1 million to \$10 million per mile in 2019. What evidence is this based on?	As previously stated, TEP has solicited a study to validate the costs of undergrounding transmission lines in TEP's service territory. This study has been completed and can be found at https://www.tep.com/wp-content/uploads/TEP-138-UG-Report-Rev.-0-signed.pdf .
15	At the Ward 6 public open house meeting, it was stated by a TEP representative that underground lines are dangerous. Does this apply to all buried lines? Does it depend on their construction? Does TEP have the ability to build safe underground lines?	All energized electrical equipment could present a potential electrical safety concern, including underground facilities. For example, underground facilities could be damaged if a tree is uprooted during a thunderstorm, excavation in the vicinity of underground facilities or if a ground-mounted electrical cabinet is damaged by a vehicle. TEP does have the ability to construct underground facilities that are as safe as possible.
16	What is the history of maintenance for underground lines where they exist in the TEP service area? Can we itemize those costs?	Some of the early implementations of underground distribution lines are reaching their design life and experiencing failures. TEP does not have any transmission level underground lines and therefore has no history or cost experience for associated maintenance.
17	If we were to move forward with underground lines, what would the unusual costs be? Can we find ways to reduce these costs? For example, what part of "trenching" costs is labor? Does this labor force currently exist? Are there perhaps funds to train specific populations for technical jobs?	Please refer to the underground report at https://www.tep.com/wp-content/uploads/TEP-138-UG-Report-Rev.-0-signed.pdf .
18	Can we have an independent assessor for determining the costs of undergrounding?	TEP's study is being performed by a third party consultant. Should anyone want to commission an independent study, they may.
19	Does TEP have studies based on other southwestern cities' experiences of undergrounding?	TEP does not have specific studies from other cities.
20	How can we develop a rate schedule for differentiated services (overhead and underground)?	Rate schedules are developed by TEP in conjunction with the ACC. If customers want to develop an undergrounding district, specific rate schedules can be developed.
21	How will the new solar supplies influence the reliability of our service, the nature of our infrastructure, and our rates?	Renewable energy is not available at all times, and requires either conventional resources or energy storage systems to provide reliable service to customers. Energy storage is in its infancy and is very costly to add with renewable projects. TEP takes these items and potential reliability impacts into consideration throughout its long-term resource planning process. Large, community-scale wind and solar projects are usually the most cost effective renewable options available, but require sufficient transmission infrastructure to deliver the power to where it is needed.
22	Announcements have been made about the TEP and UA partnership to make the UA power source completely solar. Will this installation be exclusively for the use of the UA?	No. Three new large renewable energy projects are scheduled to become operational by 2021, allowing TEP to produce more than 28 percent of its power from renewable resources. TEP will dedicate portions of a new wind project and a new solar energy project to serving some of the UA's energy needs.
23	What are the dates and locations for the Community Working Group and public open house meetings in 2020?	The next CWG meeting is set for February 12, 2020.
24	Will future public open house meetings be conducted in a style that allows all in attendance to simultaneously take part (rather than a walk-around as was planned for the first meeting in 2019)?	TEP will provide a presentation at the next CWG meeting in early 2020, followed by the open house format. At TEP-hosted public meetings, the company typically solicits and captures public input using the open house format.
25	One week is not an adequate amount of time to respond to TEP plans. Will we be advised of plans changes with at least three weeks to respond?	As indicated in our project schedules TEP is striving to give as much advance notice of our project to be able to solicit valuable feedback.
26	Can TEP define terms familiar to TEP yet not familiar to the CWG members, e.g. load center, and other terms.	Yes, please see attached.
27	What is the Purpose and Need of the Project?	Energy demands in the project area have grown over time and the existing radial 46kV sub-transmission system is becoming loaded to the point of maximum capacity. This increased energy demand creates concerns about overload conditions and reduces TEP's ability to restore service to customers in the area in the event of an outage. A new 138kV looped system will provide additional capacity and improve reliability, reducing dependence on the existing 46kV system. The 138kV loop also will add additional contingency capacity to the existing adjacent 46kV substations.
28	What are the minimum vertical and horizontal clearance for the line?	Vertical 15.7' over roof, 9.7' horizontal clearance, 25' to ground.
29	Cost sharing of underground costs with U of A and Banner.	TEP installs its transmission lines overhead. There are methods available for entities to create an undergrounding district to cover incremental costs of underground transmission and TEP is willing to discuss and consider such a mechanism.
30	What wind capacity are the structures designed to handled?	The poles are designed to the extreme wind case, which is 90mph.
31	How tall does the 138 kV pole need to be if it is double circuited.	The height is variable depending on surrounding circumstances, but is typically 75-110 feet tall.
32	Why didn't we have a say in the location of the UA North Substation?	Substation location is a planning function determined by TEP planning studies. A load center is basically the center of an area of energy demand equivalent to approximately 80 MW, which is the design standard for TEP 138kV substations. As TEP studied its system in the central portion of the city, it determined that the load center for purposes of siting a substation was in the vicinity of the identified UA North Substation. TEP's Land Department was tasked with finding potential substation sites in the vicinity that could accommodate a 138kV substation. During the process, it was determined that the proposed location was one of the few sites large enough and the only location the UA was agreeable to selling.
33	What is the depth of underground distribution?	Dependent on voltage. 4.16 kV is 3'-0" to the bottom of the uppermost buried 4" conduit. 13.8 kV is 4'-0" to the bottom of the uppermost buried 6" conduit.
34	What is the required ROW width? Why is less for road ROW?	The typical ROW width for a 138 kV transmission line is 100-feet wide. This width not only allows for the transmission line facilities, but also access to the facilities. When public road right of ways are available, the easement right of way width can be less because access is available from the public road and facilities can be placed within them. TEP's franchise agreements with the City and Pima County allow for placement of the transmission line in the public road right of ways.

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35	Why is the existing 138 kV system circling the city, instead of being through the city? Was this intentional because health or safety?	For decades, TEP's system consisted of 46kV service to load. As energy needs increased and more capacity was needed, TEP developed a 138kV loop around the city with 138kV substations providing service to the existing 46kV system. As Tucson continued to expand, development typically occurred around Tucson's core. With recent efforts to develop in-fill projects to reduce urban sprawl, load density within the core of the city has increased, putting pressure on the aging 46kV system. This necessitates the development of new 138kV facilities with greater capacity through the city.
36	The "Thrive in 05" collaborative is planning to revitalize certain areas along Stone Ave. TEP should seek the organization's input before determining routes that would impact their plans.	TEP has reached out to the organization to request revitalization plan information. Thrive in 05 representatives have also been invited to participate in future CWG meetings.
37	Are there any alternative substation "types" or an alternative gas that can be used in the GIS?	Please see "TEP Response to SF6 Questions".
38	What is the difference between the stakeholder group and the CWG?	Stakeholders are technical experts representing other utilities and governmental jurisdictions that can provide information related to how the project may directly impact their facilities. CWG members are the representatives of their neighbors and constituents that can provide unified perspectives to TEP and other CWG members, and also share information with the neighborhood or other constituency they represent In addition, all members of the public are invited to participate in public open house meetings. Residents of neighborhoods participating in the CWG also are invited to participate individually.
39	How are stakeholders/CWG members selected?	Once TEP develops a study area, it works to identify potentially affected neighborhoods, schools, jurisdictions, utilities and others that may be impacted. Throughout the process, TEP may identify additional stakeholders and CWG members that would benefit from participation.
40	Multiple questions about choice of GIS substation and SF6 Gas.	Please see attached "TEP Response to SF6 Questions".
41	Can TEP Underground the Lines?	Transmission lines can be installed underground in some circumstances, but at considerable cost. TEP has solicited a study to validate the costs of undergrounding transmission lines in TEP's service territory. This study is located at https://www.tep.com/wp-content/uploads/TEP-138-UG-Report-Rev.-0-signed.pdf . Additional costs for installing transmission lines underground would need to be borne by entities in the area that object to overhead lines. In addition, residents in those areas should be informed about the physical disruption that would be caused during construction of the facilities.
42	Is TEP looking at the potential impacts of the project on the Banner helipad?	Yes, as the project involves construction of permanent structures of significant height that will be located within 3.8 miles of the University Medical Center Heliport, a notification of the proposed construction will be required to be submitted to the FAA for an obstruction evaluation.
43	What is an orphan pole and why are there so many of them?	Some power poles also support equipment from other utilities, including cable and telephone lines, through joint-use agreements. When TEP relocates power lines or otherwise abandons a power pole, TEP usually will cut off the top of the pole, above where other utilities' equipment is attached. It is the responsibility of the remaining utilities to relocate their facilities. This can take a considerable amount of time and TEP has no authority to force their relocation.
44	What is under Park Avenue at the UA?	TEP does not have information regarding facilities under Park, possibly the City does.
45	Is it an option to use both sides of Vine (link 31)?	TEP will determine this during the alternatives analysis phase of the project.
46	Provide information about the load center and why subs/lines are needed in those locations.	See response to #32. The load center is a representation of the location of a planned 80 MW distribution area.
47	Why isn't 36th Street, west of Kino, a link?	Based on the siting work and hearings for the Irvington to Kino line there is no room for line to be installed along 36th in that vicinity.
48	Why can't we use the U of A's existing underground tunnels?	The existing underground tunnels would not accommodate a 138kV system in addition to existing U of A facilities.
49	Can TEP provide information on TEP's 10 Year Plan, load center analysis, and projected future demand within the study area?	Utility ten year plans can be found at: https://azcc.gov/utilities/electric Please see "Existing and Future Loading and Service Areas" following this table. This exhibit shows the percentage energy demand and current service areas of the existing substations as well as Projected energy demand and revised services areas based upon the UA North Substation.
50	Can TEP provide more information about the City of Scottsdale underground utilities district?	Information regarding the City of Scottsdale Underground Utility Facilities Improvement District can be found at: https://www.scottsdaleaz.gov/construction/underground-utility-facilities-improvement-district
51	Provide an overview of the last case CEC (Irv-Kino), and provide information about the inequalities of the line.	The Irvington to Kino project information is on TEP's website at TEP.com.
52	What are the long term costs associated with underground transmission lines?	Additional training costs and curriculum for the cableman that have to maintain the underground system recurring annually. Additional equipment would be required than TEP does not currently own, which would have to be kept in good working order. Inspections every 6-12 months may require right-of-way use permits, traffic control plans, and lane closures in order to access man vaults to complete splices. Will spend additional labor to get a clearance on the line in order to access the vault. The other aspect of long term cost comes from if a failure does occur the cost to repair or reestablish the system is exceptionally larger than if the line is overhead
53	Why are attachments allowed on poles with electrical easements on private land when the easement says it is for electric only?	TEP is required to allow attachments by other utilities per the Code of Federal Regulations (§1.1403 Duty to provide access; (a) A utility shall provide a cable television system or any telecommunications carrier with nondiscriminatory access to any pole, duct, conduit, or right of way owned or controlled by it). It is the responsibility of the utility attaching to TEP poles to obtain their own easements.
54	Why is Jack and Bore not being considered as an alternative to open trenching along the entire line in the underground study	Jack and bore construction incurs drastically higher costs of installation, and limits length to about 500 feet. Jack and bore takes longer to install than open trench as well, and requires a pit every 500 feet or so. Longer installation times also would result in traffic impacts that last longer than open trench installation
55	Would underground facilities be within road ROW?	Whenever possible, yes
56	Where did the pictures in the underground report come from?	Some were publicly available online, others were from previous projects completed by S&L.

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57	Could you talk more about horizontal directional drilling as an alternative to open trench?	Horizontal directional drilling uses a large casing that is installed at an angle starting at the surface, and the cable has a maximum allowable bending radius which pushes the cables deeper into the ground than a standard duct bank. Inside that casing are multiple ducts pulled through the casing and then the cable is pulled through the duct. Due to the ampacity requirements on the cable a thermally conductive flowable grout or slurry would be needed to fill all voids in the casing to help with cooling of the cable. The slurry would be gravity fed to the bottom of the installation, and the potential for air pockets exists, which would further increase heat entrapment and increase line losses
58	When undergrounding, would you try to go under other utilities or relocate them or over?	It depends on the utility, usually we would go under but we may relocate when needed.
59	How does fault and inspection work on underground segments?	Inspection is conducted visually. In the event of a fault caused by someone accidentally excavating into the duct bank the fault is very easy to locate, but difficult to repair. The duct will need to be repaired, which is difficult due to the backfill of concrete. When a failure occurs where no physical external damage is evident then signal methods are used to try and identify the location of the fault.
60	What kind of maintenance is required for underground?	Routine visual inspections on terminations, arrestors, grounding, splices, cables and vaults looking for any sort of glaring issue that would require attention. This work would have to be done while deenergized. Every 5 years or so a more intensive inspection would be conducted looking in more detail at each aspect of the underground system looking for any evidence of long term usage stresses that could lead to faults if not pre-emptively located and addressed.
61	Do underground lines require more maintenance or less?	The underground typically requires less maintenance, but the time and cost required to do the underground inspection will likely be larger than equivalent overhead due to the coordination and labor associated with acquiring an outage, acquiring permits and establishing traffic control to access the man vaults
62	Why does underground maintenance cost more?	Only the terminations can be visually inspected. Any other inspections require more sophisticated parameter analysis. Repairs are significantly more expensive.
63	How do failures differ between underground and overhead, isn't overhead more susceptible to faults?	Overhead lines are more susceptible to faults, but the results of the faults are significantly easier to mitigate. Most overhead faults self-clear and the line can be re-energized within seconds. For those that don't self-clear, minor issues can be fixed within a couple of hours (branch/balloon stuck in the line, broken insulators...), 1-2 days for a short blowdown (working 24 hours a day), and up to 5 days if the blowdown is very large (again, working 24 hours a day). For underground, feedback from multiple consultants suggests fault induced outages on underground transmission takes no less than two weeks to restore regardless of how minor the issue is. Due to the expense of the cable no one wants to prematurely re-energize the cable without thoroughly checking there is no issue with the cable. If the cable needs to be replaced the outage would likely be much longer. If the damage is catastrophic and the duct bank is destroyed the outage would last no less than 6 months while materials are procured and a new duct bank is installed.
64	Don't you have backups so electricity can come from more than one place?	This project is designed to complete the loop for the transmission system so Kino Substation and UofA North Substation can each have two sources.
65	Property values will go down.	Reports that TEP has reviewed indicate that short-term impacts to value can occur, but that in the long term (> 5 years) property values are not greatly affected by transmission lines.
66	Is there a future demand study TEP could share with the CWG?	Please see "Existing and Future Loading and Service Areas" following this table. This exhibit shows the percentage energy demand and current service areas of the existing substations as well as Projected energy demand and revised services areas based upon the UA North Substation.
67	On AZ revised statutes for an underground district, are there limits to size or a district, big or small?	No, the undergrounding district can cover whatever size that property owners support.
68	Are there other underground districts in AZ?	TEP has not researched undergrounding districts in Arizona other than the Scottsdale example.
69	How does the Bridges affect electric load and were there private neighborhood meetings held?	TEP hosted public meetings for the Irvington to Kino 138 kV Transmission Line, which was approved in a public process by the Arizona Corporation Commission and is currently under construction. The Tucson Marketplace currently is interconnected to TEP's existing 46 kV line and experiences the same issues with power delivery as the rest of the surrounding neighborhood. The Kino Substation will provide improved service to the neighborhood. This 138 kV line will help to provide more reliable service to Tucson Marketplace due to the "looping" associated with this project.
70	Would like to have this info (previous question) and more about the inequalities of the line.	This project will improve reliability throughout TEP's service territory.
71	Does engineering firm [that did the underground study] have experience and who decides the cost benefit of undergrounding?	Yes Sargent & Lundy has experience on multiple underground transmission design projects, including voltages up to 345kV. Neighborhoods, in conjunction with the City of Tucson will determine the benefit cost regarding undergrounding through their analysis of creating an underground improvement district.
72	Can you include long term costs in the estimate of total costs [related to underground]	Assuming we follow the recommended inspection protocol of every 6 months, and in depth every 5 years, and accounting for the likelihood that the man vaults will be in road right of way it will cost roughly \$15,000 every 6 months for the semiannual inspection (to acquire the right of way use permits, scheduling the outage, setup the traffic control, de-energize the lines, perform inspections, remove traffic control, re-energizing the line, and finally log results of the inspection). The 5-year inspection would be no less than double that amount. So every 5 years we would spend roughly \$165,000. This assumes inspection only, and no repairs have to be made.
73	Shouldn't investors pay for increased costs for underground?	TEP is required to serve its customers in a reliable, cost-effective manner. The additional costs of undergrounding to meet the preferences of individual neighborhoods would be charged to those neighborhoods. This practice avoids passing along unnecessary costs to customers through our rates. It also ensures that all of our customers are not asked to subsidize a discretionary expenditure that primarily benefits residents of one small area of our service territory. The Arizona Corporation Commission (ACC) has supported this practice by approving rules that allow for recovery of costs from those who request underground facilities.
74	So could you decide who is benefitting to determine who was paying. It turned out to be \$1.50 a month. Can we ID the service area to identify a bill impact?	Billing would be determined through the undergrounding district process, which would be managed by the City of Tucson.
75	Will neighborhoods benefit from the 138 kV line?	Yes, and the undergrounding district funding mechanism can be structured for differing rates. The structure could include recognition of various items such as; volume of use or proximity to the line.
76	How big would this funding district be?	The configuration, size and other details of the undergrounding district would be determined in a process managed by the City of Tucson. The district could be configured by neighborhood, or link-by-link.
77	Is the line siting and funding district a separate process?	Yes. A funding district is separate from the line siting process. The most likely scenario is that the line siting process is completed first and then the district is developed based on which portions of the approved route people want undergrounded.

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78	Additional power users would not vote yes on undergrounding district, but they are the ones demanding more power...the neighborhoods power is going down.	While load growth is a part of the driver for this project a much larger driver is the need to upgrade the aging infrastructure currently serving the neighborhoods. In addition, this project will enhance reliability beyond the neighborhoods surrounding the UA North Substation, including neighborhoods surrounding the Kino Substation at Kino Blvd and 36th, the DeMoss-Petrie Substation at Grant and Interstate 10, and the Tucson Substation near Main and St. Mary's road. Additionally, peak energy demands throughout TEP's service territory have increased by about 9 percent since mid-2015. New infrastructure would help meet customers' current and future energy needs. The City's development of the undergrounding district will determine the participation of various users of the power.
79	Would like info on Scottsdale districts from APS.	See response to question 50.
80	Sensitive receptors, what does it mean?	Sensitive receptors are from NEPA requirements. They are areas where there is a perception that the occupants are more susceptible to the effects of exposure to a project.
81	Will there be a health interpretation in this study?	Once alternative routes are selected, they will be compared to existing electromagnetic fields (EMF) in an EMF Study. More information about EMFs is available at tep.com/electric-and-magnetic-fields/ .
82	What about EMF from the Substation?	The equipment inside the substation is far enough away from residents and behind a wall, mitigating the level of EMF outside of the substation. More information about EMFs is available at tep.com/electric-and-magnetic-fields/ .
83	I feel like TEP lines are an eyesore, and the orphaned lines with Cox line are an issue.	We have little control over cable and other telecommunication lines installed on TEP's poles. These other companies indicate they have limited resources to relocate their lines.
84	There may be smaller lines on orphaned poles interspersed between larger transmission poles.	No, all existing facilities along the new transmission line will be buried, including cable.
85	They say you must share poles with communication lines, who is they?	The requirement is spelled out in the Code of Federal Regulations (see response to question 53).
86	Could we use different coatings to improve visuals of the transmission poles.	Yes, but each coating has different impacts relative to maintenance as well as visual impact. TEP's standard for use of weathering steel was developed based on life cycle cost as well visual impacts.
87	What does the maintenance cost for painted poles?	On average the cost is \$8,300 per structure, not including the cost to take the line out of service or costs for ROW use permits, traffic control, etc.
88	What ranking did a sensitive receptor receive?	Sensitive receptors received a rank of 1, which is the highest sensitivity level.
89	What determines what is perceived as a sensitive receptor?	Sensitive receptors are defined as used in most GIS literature as a standard set of organizations. (Hospitals, schools, long term care, and healthcare facilities)
90	Which direction does the ranking go?	3 is preferred and is marked as green, 0 is the most constrained and is marked as red.
91	Why is the railroad a 0	Union Pacific Rail Road (UPRR) does not allow us to build poles within 300 feet of the centerline of their tracks or site the line perpendicular to the railroad, within their right of way.
92	Historic designation is only for historic designation not by age of property or homes?	Yes, TEP is using the National Register of Historic Properties to identify registered historic properties.
93	Can we have info from the transportation district and what is the planned development on Stone ave?	We are working with the COT Transportation Department to identify planned road projects that the Project may affect.
94	Kino is a gateway route (implied it should not be used).	City of Tucson has designated Kino/Campbell as a Major Gateway route. Many streets in Tucson are designated as such. The designation is made if at least two of the following conditions apply: <ul style="list-style-type: none"> · identified as a regional corridor · identified for future street improvement and adjacent development · used by visitors to reach transportation terminals, hotels, resorts, and recreational facilities · average daily volumes generally over 30,000. Gateway routes are routes to major employment centers, shopping areas, recreational areas, and transportation centers which are used regularly by large numbers of residents and visitors. The purpose of this designation is to improve the appearance of the built environment through the use of standards for the design and landscaping of the roadway and adjacent developments. These standards are not to be applied retroactively but to guide new construction, so that over a period of years the appearance of the streetscape is improved. TEP recognizes the standards associated with such a designation.
95	Please itemize with date, duration of time, and location of any and all of the "brown-outs" that have occurred in the Study Area for the Kino-Banner-Petrie project.	Please see the compiled outage information following this table for the years between 2015 and 2019. The information provided shows outages with a duration greater than 5 minutes as well as the SAIDI (avg outage duration for each customer served) and SAIFI (avg. number of interruptions a customer would experience). The information provided also shows what energy demand the UA North and Kino substation will be relieving.
96	Please verify that Banner severed its tie with the Hospital's former primary power provider, the University.	Banner purchased the hospital from the University of Arizona. Prior to the purchase of the hospital, TEP supplied power to the university, which used its own facilities to supply the power needs of the hospital. As part of this project, TEP will provide service to the hospital directly from the new substation instead of university facilities.
97	If indeed the power is no longer being provided to Banner by the UA, please identify the rate that Banner is now paying TEP, and what other incentives TEP may have extended to Banner and any other big power users in the UA vicinity.	TEP's customer's rates are determined by the Arizona Corporation Commission under rate schedules approved during a utility rate case. Banner is served under current TEP rate schedule.
98	Will the proposed power-line poles replace existing ones? Or will the new poles be installed in addition to existing poles?	If the new 138 kV transmission line were to be placed in an area where there is an existing line, the existing line would be re-located as necessary.
99	There is a lot of litter that accumulates on Campbell, Kino, and Plumer Avenues. Is there anything TEP can do to mitigate this?	TEP is not responsible for this. The City of Tucson should be notified.
100	Has TEP fully explored decentralized electrical production as a way to help alleviate peak demand?	TEP is engaging key community stakeholders, collaborating with world-class climate experts at the University of Arizona, and proposing development of new carbon emission reduction goals to prepare for its customers' future energy needs through an Advisory Council for TEP's Integrated Resource Plan. More information regarding TEP's resource planning efforts can be found at: https://www.tep.com/resource-planning/
101	Sidewalks on Campbell, Kino, and Plumer Avenues are somewhere between non-existent and woefully inadequate (not continuous, in disrepair, contain obstacles, not wide enough even in places without obstacles). Will TEP install, repair, and/or otherwise ensure continuous, unobstructed sidewalks of at least 36 inches in width and in good condition where the new power poles will be built?	TEP will repair/replace any sidewalks disturbed during construction. TEP is required by the City to maintain existing Americans with Disabilities Act (ADA) sidewalks or room for the City to install them in the future.
102	Army Corps of Engineers is planning work on the Arroyo Chico between Plumer and Campbell Avenues. Will this affect the TEP power-line project?	It should not. In the event the approved route were to be in this location, TEP would work with the ACOE to mitigate any impacts.

Kino to DMP Transmission Line Project

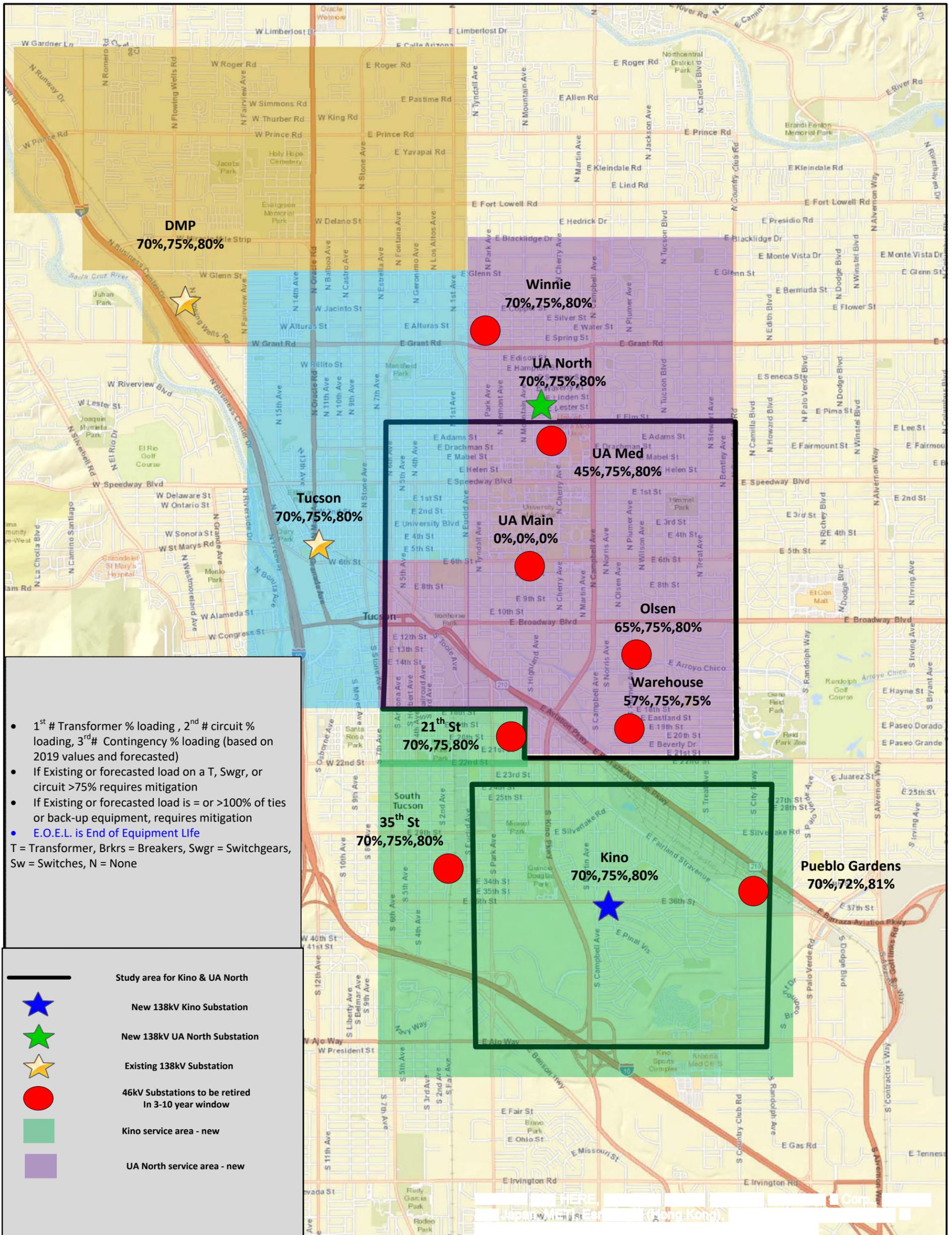
CWG Questions and Responses

No.	Question	Response
103	The Kino/22d Street intersection project Citizens Advisory Committee (CAC) spent many many hours over many meetings discussing and deliberating over the overpass bridge design (with Structural Grace, the bridge builders) and over the accompanying artwork (with Barbara Grygutis, project artist). The Kino Parkway bridge over 22d Street is an aesthetic bright spot in an area not necessarily renowned for architectural or other beauty. It is not clear that TEP's proposed power poles would positively complement the bridge structure (or, for that matter, the new El Rio clinic at the southeast corner of the intersection).	In the event the approved route were to be in this location, TEP would work with appropriate parties to address this concern.

Kino to DeMoss-Petrie 138 Kilovolt (kV) Transmission Line Project



Future Loading & Service Areas



Kino to DeMoss-Petrie 138 Kilovolt (kV) Transmission Line Project Outage Information



Average Substation & 46kV Line (combined) Outages per Year (2015-1019)			
Substation Affected	Outage Duration / Year (minutes)	Outage Frequency / Year	Customers Served
OLSEN	2,970	32	4090
WAREHOUSE	2,552	14	1853
WINNIE/UAMED	8,134	42	7831
WINNIE/UAMED	8,498	43	7831
Pueblo Garden/21st/35th	7,813	48	5970

Average 138kV Transmission Line Outages per Year (2015-1019)			
Substation	Substation	Outage Duration / Year (minutes)	Outage Frequency / Year
IRVINGTON	TUCSON STATION	0.14	0.40
NORTH LOOP	DMP	0.05	0.40
SANTA CRUZ	DMP	0.00	0.00