Glenwood Telecommunications, Inc.
Glenwood & SCPPD Project
Attachment E – Technical Statement

Working together, Glenwood Telecommunications and South Central Public Power District (Applicant) propose to deploy highspeed broadband service to consumers in Clay, Nuckolls Counties, and the village of Guide Rock in Webster County. Applicant has previously deployed consumer broadband networks. Since 2006, Applicant deployed fiber-to-the-home service to all ILEC areas and some CLEC communities; all in the state of Nebraska. Applicant currently serve 3694 fiber-to-the-home subscribers in Nebraska. Available services Applicant offers are voice, long distance, broadband and managed Wi-Fi to our subscribers.

Applicant offers fiber broadband service at the following rates:
- 300 MB down / 150 MB up $49.95
- 500 MB down / 250 MB up $59.95
- 700 MB down / 350 MB up $69.95
- 1 GB down / 500 MB up $89.95

Business-class broadband service is $10.00 additional. Symmetrical broadband service is available for additional $20.00. Applicant does not require service contracts nor charge for service installation. Applicant does not limit data-usage to any subscribers.

Project will be serviced by Applicant's existing staff of professionals who currently manage and maintain our broadband networks. Staff is always adjusted to meet demand and the potential growth would be balanced with the need for additional staff.

Applicant manages all aspects of their broadband networks including edge, middle-mile and last-mile operations.
- Last mile connectivity in our network is provided through a Gigabit Passive Optical Network (GPON) point-to-multipoint and Active Ethernet point-to-point connections. The relevant industry standards for the last-mile fiber deployment are GPON (ITU G.984) and Active Ethernet (IEEE 803.2ah). Each GPON subscriber is connected into the optical network via fiber from a passive optical splitter. There are no active electronics in the distribution network, and bandwidth is shared from the feeder to the drop. The optical network terminal (ONT) is the access endpoint that provides an optical termination at the subscriber premises, and provides subscriber services (Broadband, Voice, Pseudo Wire, etc.). Home gateway or residential gateway (RG) functionality may also be integrated with ONTs and associated with LAN-side Ethernet ports and WiFi SSIDs.
- Applicant utilizes Ciena Z33 and Z77 equipment fiber network. It is a fully integrated scalable packet-optical platform that supports up to 200 Gb/s of capacity per slot and 2.8 Tb/s per chassis. The carrier-grade architecture supports the full suite of Z-Series Ethernet, wavelength, OTN, and SONET/SDH modules, plus an optional switch-fabric. Ciena's Z-Series were among the first products to achieve Carrier Ethernet 2.0 (CE2.0) certification from the Metro Ethernet Forum (MEF), ensuring the platforms enable cost-effective Ethernet service delivery with carrier-grade capabilities such as QoS, scalability, reliability, and service management. Beyond CE2.0, the Z-Series also implements Connection-Oriented Ethernet (COE) to provide more resilient and predictable Ethernet transport for E-Line, E-LAN, E-Tree, and E-Access services at interface rates up to 100GbE. A multilayer transport solution, the Z-Series provides simultaneous support for native transponding and muxponding of G.709 OTN and SONET/SDH, in addition to SONET/SDH multiplexing and cross-connect functionality. Rounding out support for wholesale wavelength services, the Z77 also supports a complete range of ROADM-DWDM options.
- Applicant's edge network uses Cisco ASR-9900 routers which take advantage of a converged, full-featured aggregation platform designed for the mobile and business markets with the Cisco ASR

platform. It has the flexibility to support 1G, 10G, 25G, 40G, 100G, and 400G ports allowing deployments for small market remote Point-Of-Presence (POP) applications, or to serve as a Metro aggregation router for mobile traffic. The ASR 9000 gives us full redundancy, shallow depth, low power consumption, and high service scale making it one of the most versatile infrastructure units on the market.

- Applicant's internet access service utilizes IP based network with public IPs routed to the customer premise equipment over a layer 2 private network. Upstream connectivity to the public internet is provided via multihomed BGP fiber connections to multiple tier one providers. Applicant has direct connectivity to multiple Tier 1 network providers including 10 GB DIA service from Zayo in Denver, 10 GB DIA service from Zayo in Kansas City, 10 GB DIA service from Hurricane Electric in Omaha: along with 10 GB peering service from OmahaIX.

Network Performance bases assertions made from historical data gained by years of owning and maintaining an existing network infrastructure. Applicant retains accurate information about subscription counts, available network resources, and latency on an individual platform basis. Best practice policies are implemented to prevent over utilization and create benchmark criteria to indicate where reinvestment or upgrades are required. These policies are based on engineering specifications and periodic testing of infrastructure. Network management systems actively monitor for performance degrading hardware errors, utilization trends, and quality of experience metrics and are reviewed by NOC technicians. We adopt conservative subscription ratios. In last-mile applications, where client's bandwidth traverses through a centralized access platform, we have adopted a 5 to 1 subscription ratio. We consider both upload and download subscription rates when calculating the total subscription ratio of all network segments and are designed to facilitate growth and are considered to be exhausted when nearing an 8 to 1 ratio. Finally, our core service aggregation platforms are stringently monitored and upgraded when nearing an 70% resource threshold.