CITY COUNCIL

MEETING AGENDA

August 5, 2021

City Council Chambers located at: City Hall – 410 Ludington Street – Room C101 – Escanaba, MI 49829

The Council has adopted a policy to use a Consent Agenda, when appropriate. All items with an asterisk (*) are considered routine by the City Council and will be enacted by one motion. There will be no separate discussion of these items unless a Council Member or citizen so requests, in which event, the item will be removed from the General Order of Business and considered in its normal sequence on the Agenda.

Regular Meeting

Thursday, August 5, 2021, at 7:00 p.m.

CALL TO ORDER
ROLL CALL
INVOCATION/PLEDGE OF ALLEGIANCE
APPROVAL/CORRECTION(S) TO MINUTES – Regular Meeting – July 15, 2021
APPROVAL/ADJUSTMENTS TO THE AGENDA
CONFLICT OF INTEREST DECLARATION(S)
BRIEF PUBLIC COMMENT(S)
PUBLIC HEARINGS

1. **Second Reading, Public Hearing and Adoption of Ordinance No. 1251, An Ordinance to Amend Chapter XIX of Appendix A as Codified Under the Code of Ordinances – Planning & Zoning.**
   Explanation: Administration is requesting the City Council to consider approval and adoption of Ordinance No. 1251, An Ordinance to Amend Chapter XIX of Appendix A as Codified under the Code of Ordinances – Development Standards for Granting Plan Approval.

2. **Second Reading, Public Hearing and Adoption of Ordinance No. 1252, An Ordinance to Amend Chapter XXI of Appendix A as Codified Under the Code of Ordinances – Planning & Zoning.**
   Explanation: Administration is requesting the City Council to consider approval and adoption of Ordinance No. 1252, An Ordinance to Amend Chapter XXI of Appendix A as Codified under the Code of Ordinances – Central Retail Commercial District.

UNFINISHED BUSINESS – None
NEW BUSINESS

1. **First Reading of Ordinance No. 1253, An Ordinance to Amend Chapter XVII of Appendix A as Codified Under the Code of Ordinances, and Setting the Date of Thursday, September 2, 2021, for the Second Reading, Public Hearing, and Adoption – Planning & Zoning.**
   Explanation: The Planning Commission is requesting the City Council to consider this the first reading of Ordinance No. 1253, An Ordinance to Amend Chapter XVII of Appendix A as Codified under the Code of Ordinances – Chapter 17 – Parking & Circulation Requirements. Administration is requesting that the City Council set September 2, 2021, for the second reading, public hearing adoption of Ordinance No. 1253.

2. **Approval – Enhance Escanaba Agreement - Controller.**
   Explanation: Administration is seeking approval to enter into a funding agreement with Enhance Escanaba. The group will be doing beautification projects around the City. Funds have been budgeted for this expenditure.

3. **Approval – Resolution and Signing of a Contract – Recreation.**
   Explanation: Administration is recommending passing a Resolution for authorized signatures on the North City Limits Non-Motorized Pathway. Administration is recommending signing of the Contract between Michigan Department of Transportation and the City of Escanaba for the North City Limits Non-Motorized Pathway.

4. **Approval – Award of a Bid to Payne & Dolan, Inc. – Recreation.**
   Explanation: The State of Michigan let bids out for the North City Limits Non-Motorized Pathway. Two bids were received. Administration is seeking approval for the low bid from Payne & Dolan, Inc. in the amount of $867,092.05.

5. **Approval – 2021 Silverado Regular Cab Pickup, 4WD – Water.**
   Explanation: Administration is seeking City Council approval to purchase a 2021 Silverado Regular Cab Pickup 4WD from Riverside Chevrolet Buick GMC of Escanaba, Michigan at a cost not to exceed $30,000, including $449.00 for running board steps, $695.00 for bed liner, and $1,500.00 for signage, amber lighting, and city 2-way radio. Money has not been budgeted, but is available for this purchase within the current budget.

6. **Approval – 2021 Ram 5500 Regular Cab DRW 4x4 with Dump Box – Water.**
   Explanation: Administration is seeking City Council approval to purchase a 2021 Ram 5500 regular cab DRW 4x4 with dump box from LaFontaine CDJR-Lansing from Lansing, Michigan, at a cost not to exceed $62,000 delivered and $1,500.00 for signage, lighting, and 2-way radio. Money is available and allotted for this purchase within the current budget.

7. **Approval – Asbestos Removal Bid – Wastewater.**
   Explanation: Administration is seeking City Council approval to hire and retain the services of Pearson Asbestos Abatement of Escanaba, MI, for the removal of asbestos at the City of Escanaba Wastewater Plant in an amount not to exceed $18,000.00.

8. **Approval – DWSRF Water Plant Improvement Project – Water.**
   Explanation: Administration is seeking City Council approval to hire and retain the engineering services of C2AE of Escanaba, MI, to assist the City with regard to phase one of the engineering plans for the Water Treatment Plant (WTP) Improvements Project in an amount not to exceed $196,000.00. Total Engineering for the project shall not exceed $735,200 should the City accept the DWRF loan.

9. **Approval – DWSRF Lead Service Line Replacement (LSLR) Project – Water.**
   Explanation: Administration is seeking City Council approval to hire and retain the engineering services of C2AE of Escanaba, MI, to assist the City with regard to first phase of the engineering plans for the DWRF Lead Service Line Replacement Project for the City of Escanaba Water Treatment Plant in an amount not to exceed $129,100.00. Total Engineering for the project shall not exceed $754,400, should the City accept the DWRF loan.

10. **Approval – Purchase Pickup Truck – Electric.**
    Explanation: The Electric Department is seeking City Council approval to purchase a 2022 Ford pickup truck from Riverside Ford in Escanaba for a total of $32,788.00 for the Crew Leader for meeting with customers and contractors and for planning daily work for the linemen. $35,000.00 was budgeted for a pickup truck for fiscal year 2021-22. Two quotes were received through the MiDeal vehicle purchase program.

11. **Approval – Advanced Metering Infrastructure - AMI – Electric & Water.**
    Explanation: Bids were received on June 15, 2021 for Advanced Metering Infrastructure (AMI) for reading both Electric and Water meters. On July 14, 2021 the Electrical Advisory Committee (EAC) was presented with the AMI information and quotes. The EAC supported moving forward with the AMI project and recommended using Tantalus Systems as the supplier for AMI. The Electric Department is seeking City Council approval to enter into an agreement with Tantalus Systems in an amount not to exceed $800,000. The funds are in the 2021/22 capital budget. The Water Department is seeking City Council approval for $63,540.92 to cover one half of the base infrastructure of the AMI project.

12. Presentation – Historic Preservation – Planning & Zoning.

Explanation: The City of Escanaba has been awarded a Community Partnership Program award by the State Historic Preservation Office (SHPO) for a historic resource survey of the Ogden Triangle area. Alan Higgins of the SHPO office will give a brief presentation on the survey project scope and explain how the survey information could potentially be used for future historic preservation activities.

APPOINTMENTS
BOARD, COMMISSION, AND COMMITTEE REPORTS
GENERAL PUBLIC COMMENT
ANNOUNCEMENTS
ADJOURNMENT

Respectfully Submitted

Patrick S. Jordan
City Manager

OFFICIAL PROCEEDINGS
CITY COUNCIL
CITY OF ESCANABA, MICHIGAN
Regular Council Meeting
Thursday, July 15, 2021

The meeting was called to order by the Honorable Mayor Marc D. Tall at 7:00 p.m. in the Council Chambers of City Hall located at 410 Ludington Street.

Present: Mayor Marc D. Tall, Council Members, Ralph B. Blasier, Tyler D. DuBord, Karen S. Moore, and Peggy O'Connell

Absent: None

Also Present: City Manager Patrick S. Jordan, City Clerk Phil DeMay, Department Heads, media, and members of the public.

City Clerk DeMay led Council in the Pledge of Allegiance.

O'Connell moved, DuBord seconded, **CARRIED UNANIMOUSLY**, to approve Regular Meeting minutes from July 1, 2021, as submitted.

ADJUSTMENTS TO THE AGENDA

Blasier moved, O'Connell seconded, **CARRIED UNANIMOUSLY**, to approve the City Council Agenda as submitted.

CONFLICT OF INTEREST DECLARATION – None

BRIEF PUBLIC COMMENT – None

PUBLIC HEARINGS – None

UNFINISHED BUSINESS – None

NEW BUSINESS

NB-1 Approval – Renewal of Contract with Delta County Prosecutor - Administration.

Administration sought Council approval to renew the City of Escanaba contract with Delta County for Prosecution services for City Misdemeanors, provided by the Delta County Prosecutor.

NB-1 Blasier moved, O'Connell seconded, to approve to renew the City of Escanaba contract with Delta County for Prosecution services for City Misdemeanors, provided by the Delta County Prosecutor.

Upon a call of the roll, the vote was as follows:

Ayes: Blasier, O'Connell, Moore, DuBord, Mayor Tall
Nays: None

MOTION CARRIED.

NB-2 Approval – Delta County Historical Society Agreement - Controller.

Administration sought approval to renew a service agreement with the Delta County Historical Society. Money was in the budget for this expenditure.

NB-2 Moore moved, DuBord seconded, to approve to renew a service agreement with the Delta County Historical Society.

Upon a call of the roll, the vote was as follows:

Ayes: Moore, DuBord, Blasier, O'Connell, Mayor Tall
Nays: None

MOTION CARRIED.

NB-3 Approval – Continuation of Contract with City Attorney.

Under Chapter II, Section 15 of the City Charter of the City of Escanaba, the City Manager shall be responsible for the appointment of the City Attorney. Chapter II, Sections 20 and 21 of the City Charter of the City of Escanaba proscribe the qualifications and duties of the City Attorney John M.A. Bergman of Nastoff & Bergman, for another year beginning July 1, 2021, through June 30, 2022.

NB-3 Blasier moved, Moore seconded, to approve the City Manager to appoint Attorney John M.A. Bergman of Nastoff & Bergman, P.C., as City Attorney for the City of Escanaba for another year beginning July 1, 2021, through June 30, 2022.

Upon a call of the roll, the vote was as follows:

Ayes: Blasier, Moore, DuBord, O'Connell, Mayor Tall
Nays: None

MOTION CARRIED.

APPOINTMENT(S) TO CITY BOARDS, COMMISSIONS, AND COMMITTEES

Mayor Tall, with Council Consensus made the following reappointment and appointment:

City Manager reappointed to the Escanaba Building Authority, expiring August 1, 2024;

David Bleau appointed to the Harbor Advisory Committee, expiring June 1, 2023.

BOARD, COMMISSION, AND COMMITTEE REPORTS

Council Members reviewed City Board and Commission meetings each attended since the last City Council Meeting.

GENERAL PUBLIC COMMENT

Valerie Heemstra – discussed fireworks in the City of Escanaba.

ANNOUNCEMENTS

- Upper Peninsula Military Museum Gun and Knife Show fundraiser at the Delta County Chamber of Commerce Friday 23rd from noon-9pm and Saturday 24th 9:00am-3pm.
- HOG Great Lakes Rally July 22nd through July 24th.
- Bike and Classic Car Night
- Harbor Fest July 31st

NB-4 Closed Session – Closed Session at the Attorney's Request – Administration.

City Council went into a closed session at the advice of the City Attorney, to discuss possible litigation.

The time being 7:20 p.m., Blasier moved, DuBord seconded, **CARRIED UNANIMOUSLY**, the Council recessed.

O'Connell moved, DuBord seconded, to go into Closed Session.

Upon a call of the roll, the vote was as follows:

Ayes: O'Connell, DuBord, Moore, Blasier, Mayor Tall
Nays: None

MOTION CARRIED.

The time was 7:26 p.m.

Blasier moved, DuBord seconded, to come back into Open Session.

Upon a call of the roll, the vote was as follows:

Ayes: Blasier, DuBord, Moore, O'Connell, Mayor Tall
Nays: None

MOTION CARRIED.

The time was 8:37 p.m.

No Council actions were taken during the Closed Session.

Hearing no further public comment Blasier moved, DuBord seconded, the Council adjourned at 8:38 p.m.

Respectfully submitted

Phil DeMay
City Clerk

Approved: _____
Marc D. Tall, Mayor

Agenda Item: PH-1
Date: 08-05-2021

City Council Agenda Item Request

Date: 07/02/2021

Name: Roxanne Spencer

Department: Planning & Zoning

Item: Zoning Ordinance Amendment - Section 1907.1 - Development Standards

Meeting date requested: 08/05/2021

Explanation for request:

Administration is requesting the City Council to consider approval and adoption of Ordinance No. 1251, An Ordinance to Amend Chapter XIX of Appendix A as Codified under the Code of Ordinances – Development Standards for Granting Plan Approval.

ORDINANCE NO. 1251

AN ORDINANCE TO AMEND CHAPTER XIX OF APPENDIX A AS CODIFIED UNDER THE CODE OF ORDINANCES

THE CITY OF ESCANABA HEREBY ORDAINS:

CHAPTER I

Chapter 19 of Appendix A, Site Plan and Sketch Plan Standards of the Escanaba Code of Ordinances is hereby amended under Section 1907 to state the following:

Section 1907. - Development Standards for Granting Plan Approval.

1907.1.
General. A site development plan shall conform to all applicable requirements of the City of Escanaba, State and federal laws and local ordinances and approval may be conditioned upon the applicant receiving necessary local, State and federal permits before final site plan approval or an occupancy permit is granted. In addition, a development shall conform to the requirements of Chapter 18, Site Plan and Sketch Plan Standards of the Zoning Ordinance in addition to the following general development standards which shall be reflected on the site plan:

A. ***Building orientation.*** Primary structures shall be oriented so that their main entrance faces the street upon which the lot fronts. If the development is on a corner lot, the main entrance may be oriented to either street or to the corner.

B. ***Roof equipment.*** All roof-mounted equipment, including satellite dishes and other communication equipment, must be screened from recreation trails or from a public sidewalk adjacent to the site by a parapet wall or similar architectural feature.

   Exception: Solar energy collection panels do not require screening to allow maximum effectiveness.

C. V***isual and sound mitigation.*** Reasonable visual and sound mitigation for all structures shall be provided. Fences, walks, barriers and landscaping shall be used appropriately for the protection and enhancement of property and for the privacy of its occupants.

D. ***Emergency access.*** Every principal building or groups of buildings shall be so arranged as to permit emergency access by some practical means to all sides.

E. ***Street access.*** Every development shall have legal access to a public or private street.

F. ***Circulation system.*** The development, where possible, shall provide vehicular and pedestrian circulation systems which reflect and extend the pattern of streets, pedestrian and bicycle ways in the area. Travelways which connect and serve adjacent development shall be designed appropriately to carry the projected traffic.

G. ***Nonmotorized circulation system.*** A pedestrian and/or nonmotorized vehicle circulation system shall be provided which is physically separated and insulated as reasonably possible from the vehicular circulation system.

H. ***Parking areas.*** All parking areas shall be designed to facilitate safe and efficient vehicular, pedestrian and nonmotorized vehicle traffic, pedestrian circulation, minimize congestion at points of access and egress to intersecting roads, to encourage the appropriate use of alleys and minimize the negative visual impact of such parking area.

I. ***Shared drives.*** Where the opportunity exists, developments shall use shared drives. Unnecessary curb cuts shall not be permitted. Shared use access between two (2) or more property owners should be encouraged through the use of driveways constructed along property lines, connecting parking lots and

construction of on-site of frontage roads and rear service drives; particularly within three hundred (300) feet of major intersections, for sites having dual frontage, at locations with site distance problems, and/or along roadway segments experiencing congestion or accidents. In such cases, shared access of some type may be the only access design allowed. In cases where a site is adjacent to an existing frontage road, parking lot of a compatible use, or rear service drive, a connection to the adjacent facility may be required by the Planning Commission through a mutual Access Easement Agreement. In cases where a site is adjacent to undeveloped property, the site should be designed to accommodate a future frontage road, parking lot connection, rear service drive or shared access drive. The applicant shall provide the City with letters of agreement or access easements from all affected property owners.

J. ***Loading, unloading and storage areas.*** All loading and unloading areas and outside storage areas, including areas for the storage of trash, which are visible from residential districts or public rights-of-way shall be screened by a vertical screen consisting of structural and/or plant materials not less than six (6) feet in height. Loading docks should be located at the side yard or rear yard of the building.

K. ***Light sources.*** Exterior light sources shall be deflected downward and away from adjacent properties and rights-of-way so as to promote and enhance "dark-sky" designs.

L. ***Utilities.*** Adequate utilities shall be provided to properly serve the development. All utilities shall be placed underground.

M. ***Environmental issues.*** Sites at which hazardous substances and potential pollutants are stored, used or generated shall be designed to prevent spills and discharges to the air, surface of the ground, ground water, lakes, streams, creeks or wetlands.

N. ***Tree Preservation Purpose and Intent.*** Trees are a critical part of the vegetation that serves to decrease and filter storm water runoff, to mitigate the urban heat island effect created by paved and other built surfaces, to remove pollutants from the air, to abate visual and noise pollution, and to provide habitat for wildlife. Tree removal thus increases the burden on the community to effectively address these issues. The goals of the tree preservation provisions are to reduce tree loss during development, to reduce damage to standing trees during construction, to provide for replacement of trees lost during construction, to provide for the planting of trees lost during construction, to provide for the planting of trees where none occurred previously, and to provide for the maintenance of preserved trees after construction is completed.

O. ***Stormwater Control Plan.*** A Stormwater Control Plan shall be designed appropriately to carry stormwater away from buildings and adjacent properties into an approved collection system.

CHAPTER II
SAVINGS CLAUSE

If any section, subsection, sentence, clause, or phrase of this Ordinance is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this Ordinance.

The City Council hereby declares that it would have passed this Ordinance, section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional.

CHAPTER III
CONFLICTING ORDINANCES REPEALING CLAUSE

All Ordinances or parts of Ordinances in conflict with the provisions of this Ordinance are hereby repealed.

CHAPTER IV
EFFECTIVE DATE

This Ordinance shall be in full force and effect ten (10) days after its passage and publication.

APPROVED:

John M. A. Bergman
City Attorney

APPROVED:

Marc D. Tall
Mayor

Ordinance No. 1251

Date Approved:

Date Published:

Attest

Phil DeMay
City Clerk

I hereby certify that the foregoing constitutes a true and complete copy of an ordinance duly adopted by the City Council of the City of Escanaba, County of Delta, Michigan at a Regular Meeting held on the (date) day of (Month), 2021 and was published in the Daily Press, a newspaper of general circulation in the City of Escanaba on (Day), (Month) (Date), 2021, and said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

Phil DeMay
City Clerk

Agenda Item: PH-2
Date: 08-05-2021

City Council Agenda Item Request

Date: 07/02/2021

Name: Roxanne Spencer

Department: Planning & Zoning

Item: Zoning Ordinance Amendment - Chapter 21 - Central Retail Commercial District

Meeting date requested: 08/05/2021

Explanation for request:

Administration is requesting the City Council to consider approval and adoption of Ordinance No. 1252, An Ordinance to Amend Chapter XXI of Appendix A as Codified under the Code of Ordinances – Central Retail Commercial District.

ORDINANCE NO. 1252

AN ORDINANCE TO AMEND CHAPTER XXI OF APPENDIX A AS CODIFIED UNDER THE CODE OF ORDINANCES

THE CITY OF ESCANABA HEREBY ORDAINS:

CHAPTER I

Chapter XXI of Appendix A as codified under the Code of Ordinances shall be amended to read as follows:

CHAPTER 21 – CENTRAL COMMERCIAL DISTRICT ("E-3")

Section 2101. - General Provisions.

2101.1. ***Purpose.*** The Central Commercial District is intended to permit both large and small-scale "downtown" commercial development at an intensity which provides significant incentives for infill development, redevelopment, and the continued economic viability of existing development.

2101.2. ***Cross References, as amended.***

A. Zoning and planning in home rules cities; MCL 117.4I.
B. Regulation of location of trades, buildings and uses by local authorities; MCL 125.581.
C. Regulation of buildings; authority to zone; MCL 125.582.
D. Regulation of congested areas; MCL 125.583.
E. Uses of land or structures not conforming to ordinances; powers of legislative bodies; acquisition of property; MCL 125.583a.

Section 2102. - Uses Permitted in a Central Commercial District.

2102.1. ***General.*** In a Central Commercial District, a building, structure, or premises, may be erected or used for one (1) or more of the following specified purposes:

A. Bar
B. Dwelling, above first floor
C. Cultural Facilities (such as theaters, galleries)
D. Food Production, minor
E. Health Services
F. Office, Medical
G. Office, Professional
H. Recreation, indoor
I. Restaurant
J. Retail, indoor
K. Public or Governmental Building
L. Service Establishment

Section 2103. - Uses Allowed By Special Land Use Permit.

2103.1. ***General.*** The following uses of land and buildings, together with accessory uses, are allowed in the Central Retail Commercial District if a special land use permit is issued according to the standards of this chapter:

A. Eating and drinking places which include drive-in service.
B. Banks and other financial institutions which provide drive-in services.
C. Outdoor vendors. Open air markets.
D. Hotels, Motels, Inns, Bed and Breakfast, and similar lodging uses.
E. Condominium, Townhouse, Multiplex, Apartment, and other multifamily residential.

Section 2104. - Accessory Uses Permitted in a Central Retail Commercial District—When Located on the Same Lot with the Principal Use.

2104.1. ***Allowed Accessory Uses.*** Uses customarily incident to any of the permitted uses and located on the same lot therewith, provided all area and yard requirements are met.

Section 2105. - Setbacks.

2105.1. ***Front Yard Setback.*** The required front yard setback must be zero (0) to five (5) feet.

2105.2. ***Side Yard Setback.*** No side yards are required.

2105.3. ***Rear Yard Setback.*** In a Central Commercial District there shall be a rear yard of at least twenty-five (25) feet in depth on every lot as measured at right angles from the rear lot line to the nearest part of the principal building.

2105.4. ***Through Lots and Corner Lots.*** Through lots and corner lots having a frontage on two (2) streets shall provide the required setback on both streets.

Section 2106. - Encroachments Into Setbacks.

2106.1. ***Projections Into Required Yards.*** Outside stairways, fire escapes, fire towers, chimneys, platforms, enclosed balconies/porches, boiler/furnace flues, eaves, sills, belt courses, cornices and other projections shall be considered part of the building, subject to the setback requirements of the building.

Exceptions:

A. Terraces, patios, decks, uncovered and unenclosed porches which do not extend more than thirty (30) inches above grade at the nearest side property line may project into a required side setback provided these projections are no closer than two (2) feet from the subject side property line.

B. An unenclosed balcony, porch or deck may project into a rear setback for a distance not exceeding twenty (20) feet.

2106.2. ***Handicap Ramp Procedure/Other Encroachments.*** The Code Official shall have the authority to approve a handicapped ramp or other encroachment into a yard, if the encroachment is required by law and there is no other reasonable location.

2106.2.1. ***Neighbor Notification.*** Before granting any administrative approval, the Code Official shall take reasonable steps to inform the owners of the property abutting on that side of the location of the requested approval or on all sides, if all sides would be affected. The Code Official shall inform the relevant abutting owner(s) that the owner is entitled to object. The abutting owner shall have three (3) working days to make comments to the Code Official. The Code Official shall take into consideration any comments received.

2106.2.2. ***Variance.*** If the Code Official determines that there is not a basis for administrative approval, then the applicant must seek a variance.

2106.2.3. ***Administrative Denial.*** If any person who is deemed to have the status of an aggrieved person objects to the administrative approval with a stated reason before the Code Official's written decision, then the Code Official shall deny the request for an administrative approval and the applicant must file for a variance.

Section 2107. - Lot Density.

2107.1. ***Area Percentage.*** When the principal use is commercial, buildings or structures hereafter erected shall not occupy more than eight-five (85) percent of the area lot.

Section 2108. - Building Height.

2108.1. ***General.*** In a Central Commercial District, no building or structure shall exceed one hundred (100) feet in height.

Exceptions:

A. Steeples, clock towers, wireless tower, monuments, chimneys, water tanks, elevator bulk heads, or stage tower may be erected to a height not exceeding twice the height of the attached building.

B. Parapet walls may be used to screen existing equipment may be erected if the wall extends around the perimeter of the building and incorporates exterior building materials similar to those of the main building.

C. The Planning Commission may authorize an increase in height provided the request is consistent with the intent of this chapter.

Section 2109. - Accessory Buildings/Private Garages.

2109.1. ***Distances.*** Accessory buildings other than private garages shall be at least ten (10) feet from any primary building situated on the same lot and at least six (6) feet from any other building on adjacent lot or accessory building on the same lot.

2109.2. ***Front Yard Space.*** Accessory buildings may not occupy front yard space.

2109.3. ***Side Yard Space.*** Accessory buildings and portions thereof may occupy that portion of the side yard which is in excess of the side yard requirements.

2109.4. ***Rear Yard Space.*** Accessory buildings and portions thereof may occupy up to fifty (50) percent of the required rear yard space except where a rear yard abuts for its full width upon a street said buildings and portions thereof shall not occupy any of the required minimum rear yard space. On a corner lot, accessory buildings shall not occupy any part of that portion of the rear yard lying nearer to the street than the width of the side yard required for the same lot and abutting on such street.

2109.5. ***Accessory Height.*** Accessory buildings other than a private garage shall not exceed twelve (12) feet in height from the ground floor to mean height as defined in Chapter 1, General Provisions, Section 111, General Definitions. The height of a private garage shall not exceed eighteen (18) feet in height from ground floor to mean height as defined in Chapter 1, General Provisions, Section 111, General Definitions or the height of the principal building, whichever is less.

2109.6. ***Accessory Design and Finish.*** Accessory buildings must be designed to match the architectural elements and styles of the main structure and the surrounding features of the area to include structure finishes.

Section 2110. - Parking.

2110.1. ***General.*** There shall be provided at the time of the erection of any main building or at the time such buildings are altered, enlarged, converted or increased in capacity compliance with the requirements of Chapter 17, Parking and Circulation requirements.

2110.2. ***Parking Lot Location.*** In the Central Commercial District, parking lots shall be located in the rear yard only and are prohibited in the front yard and side yards.

Section 2111. - Landscaping/Paving Requirements.

2111.1. ***General.*** The applicant shall submit a comprehensive landscape plan for any project in the Central Commercial District, identifying the location and size of both existing vegetation to be retained and proposed new vegetation, typical planting materials, the phasing of landscape installation, and planting

methods. Such landscape plan shall include detail on the landscape maintenance procedures to be followed to assure the continued viability of all plantings and landscaped areas.

2111.2. ***Maintenance.*** All live landscaping required by this Ordinance shall be properly maintained. All dead or dying landscaping shall be replaced immediately and all sodded areas mowed, fertilized, and irrigated on a regular basis.

2111.3. ***Parking Areas and Driveways.*** All parking areas and driveways shall be paved.

Section 2112. - Fences and Walls.

2112.1. ***General.*** The following restriction shall apply to all fences and walls located within the zoned district, except for fences and walls surrounding public utility structures or radio, television, or microwave transmission or relay towers:

A. No person shall construct or cause to have constructed any fence or wall upon any property within the City without first having to obtain a permit.

B. Any person desiring to build or to cause to be built a fence or wall upon their property or property owned by the City shall first apply to the City for a permit. Such application shall contain any and all information required for the determination of whether the erection of such fence or wall will violate any ordinance of the City.

C. No fence or wall located in the yard shall be built to a height greater than four (4) feet above grade in the front yard and six (6) feet in the side and rear yard area. On a corner lot fences and walls nearer the street than the established building line shall not exceed four (4) in height.

D. The capital of a fence post or column may extend up to two (2) feet above the maximum fence/wall height limit. 4. No partition fence or wall shall extend towards the street beyond two (2) feet from the established lot line, nor shall any fence or wall or portion thereof be erected in any area on or parallel to the front lot line except that it shall be located a minimum of two (2) feet behind the inside edge of the established sidewalk line.

E. No person being the owner, lessee, occupant or agent for the same, of any building in the City shall erect, cause to be erected, or maintain on or about the walk or stairway to the entrance to such building, any railing, fence, guard or other projection on which there shall be affixed or placed, or in any manner attached, any barbed wire construction, nor shall there be maintained, either partially or wholly, around any area adjacent to any street, alley, lane or public way, or in or along any street or sidewalk in front or adjacent to any public space or place, or nail or cause the same to be nailed or fastened, in any form, shape or manner, upon any partition form, any such barbed wire construction, nor shall any electrical current be charged through any fence whatsoever.

F. Any person within the corporate limits of the City erecting or maintaining any fence, wall, or hedge between the edge of the established lot line and the inside edge of the sidewalk or where any sidewalk would normally be, shall be fully responsible for the care and maintenance of the fence, wall, or hedge and shall assume full responsibility for any damaged arising due to the erection of such fence or wall.

G. A special permit granted by the Planning Commission shall be required of those individuals wishing to erect a protective measures fence; such permit shall be granted only after demonstration of the need of such fence. The owner, or agent thereof, of a protective measure fence shall be granted permission to erect necessary and reasonable barriers along the uppermost edge of the protective measures fence that he deems reasonable for the protection of property within the enclosed area.

Section 2113. - Signs.

2113.1. ***Signage.*** All signs within the Central Commercial District shall conform to the standards within Chapter 20 – Signs.

Section 2114. - Special Requirements.

2114.1. ***Prohibited Residential Dwellings.*** Residential dwellings are prohibited from occupying the front fifty (50) percent ground floor area in any building unless the ground floor is elevated by one-half story.

2114.2. ***Screening.*** Dumpsters, solid waste containers, recycling containers (except for recycling containers located at Recycling Collection Centers), or solid waste must be enclosed by a privacy fence/wall constructed of wood, vinyl, cement or metal not less than six (6) feet in height. Dumpsters, solid waste containers, recycling containers (except for recycling containers located at Recycling Collection Centers), or solid waste handling area must be screened from abutting property and from public view from a public street.

2114.3. ***Construction Materials.*** At least eighty (80) percent of the front side of commercial buildings, as well as any other sides that face adjacent residential areas, shall be finished with face brick, wood, glass, stone, fluted cement block or future acceptable building materials compatible with surrounding properties. All materials shall meet appropriate architectural, aesthetic and safety concerns as provided for in duly adopted ordinances and/or building and fire codes.

2114.4. ***Incentives for Better Design and Creativity.*** Excellence in design and planning which may be achieved through appropriate innovation and imaginative concepts is encouraged. To accomplish this, alternative compliance may be proposed to the Escanaba Planning Commission in achieving appearance standard goals, provided that such change will produce a more logical and attractive use of property, in that it will be beneficial rather than detrimental to the surrounding area and the community. Proposed design alternatives acceptable under this process must not represent a waiver of requirements: the alternatives must meet or exceed the "spirit" of the law.

2114.5. ***Entrance Doorways.*** The main entrance for all buildings shall be front-facing to the street corresponding to the official property address.

Section 2115. - Conveyance Which Creates Nonconforming Uses Forbidden.

2115.1. ***General.*** No conveyance of land shall hereafter be made when, as a result of such conveyance, the land or structure of the grantor shall be caused thereby to become a nonconforming use or structure.

CHAPTER II
SAVINGS CLAUSE

If any section, subsection, sentence, clause, or phrase of this Ordinance is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this Ordinance.

The City Council hereby declares that it would have passed this Ordinance, section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional.

CHAPTER III
CONFLICTING ORDINANCES REPEALING CLAUSE

All Ordinances or parts of Ordinances in conflict with the provisions of this Ordinance are hereby repealed.

CHAPTER IV
EFFECTIVE DATE

This Ordinance shall be in full force and effect ten (10) days after its passage and publication.

APPROVED:

John M. A. Bergman
City Attorney

APPROVED:

Marc D. Tall
Mayor

Ordinance No. 1252

Date Approved:

Date Published:

Attest

Phil DeMay
City Clerk

I hereby certify that the foregoing constitutes a true and complete copy of an ordinance duly adopted by the City Council of the City of Escanaba, County of Delta, Michigan at a Regular Meeting held on the (date) day of (Month), 2021 and was published in the Daily Press, a newspaper of general circulation in the City of Escanaba on (Day), (Month) (Date), 2021, and said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

Phil DeMay
City Clerk

Agenda Item: NB-1
Date: 08-05-2021

City Council Agenda Item Request

Date: July 23, 2021

Name: Roxanne Spencer

Department: Planning & Zoning

Item: Zoning Ordinance Amendment - Chapter 17 - Parking

Meeting date requested: 8/5/21 & 9/2/21

Explanation for request:

The Planning Commission is recommending the adoption of an amendment to the Zoning Ordinance Chapter 21 - Parking & Circulation. The primary changes are focused on reducing off-street parking requirements for non-residential uses throughout the city, and for all uses in the E3 - Central Commercial District. It is requested that a Second Reading and Public Hearing be set for September 2, 2021.

Attachments:
1. Current version of Chapter 17 (mark-up version)
2. Proposed Ordinance Amendment Draft of Chapter 17

CHAPTER 17 - PARKING AND CIRCULATION REQUIREMENTS

Section 1701. - Off-street Parking.

~~**1701.1.** ***General.*** There shall be provided at the time of erection of any main building or at the time such buildings are altered, enlarged, converted or increased in capacity minimum off-street parking space with adequate provisions for ingress and egress by standard-sized vehicles in accordance with the requirements of this chapter.~~

1701.~~2~~1. ***Purpose.*** It is hereby determined that the provision for off-street parking spaces for properties with residential dwelling units is necessary to reduce traffic hazards and the congestion of streets. It is also determined that regulation of location, design, maintenance and other features of off-street parking lots is in the interest of public safety and welfare.

1701.2~~3~~. ***Compliance.*** Off-street parking must be provided for all properties with residential dwelling units in all districts as follows, except that properties zoned as E3 Central Commercial are exempt from providing off-street parking.

1701.2~~3~~.1. ***Required Parking.*** There shall be provided ~~in all districts~~ at the time of erection or enlargement of any structure containing a dwelling unit ~~main building or structure~~, ~~automobile~~ off-street parking space with adequate access to all spaces. ~~The number and paving of off-street parking spaces, in conjunction with all land or building uses, shall be provided prior to the issuance of a permanent certificate of occupancy.~~

1701.2~~3~~.2. ***Remodeling/Rebuilding.*** ~~For those buildings existing within all districts excepting districts "A", "B", and "C", n~~No additional parking space need be provided when remodeling or rebuilding of existing structures, provided the usable floor area ~~of existing structures on such site~~ is not increased in the remodeling or rebuilding. Where floor area is increased, parking space shall be provided for such increased floor area in accordance with the provisions of this Ordinance.

1701.2~~3~~.3. ***Change of Use.*** Whenever the use of an existing building is changed to a category or classification which requires more parking than the former established use, the additional demand for parking spaces created by the use change shall be provided for. Also whenever a business use is changed to a residential use, the minimum on-site parking requirements shall be provided.

~~**1701.4.** ***Handicapped Parking Facilities.*** Off-street parking facilities shall provide spaces for the handicap in accordance with the provisions of Act 230 of the Public Acts of the State of Michigan 1972, as amended.~~

~~**1701.4.1.** ***Required Minimum Number of Accessible Spaces.*** If parking spaces are provided for self parking by employees or visitors, or both, then handicapped accessible spaces complying with Table 1701.4. Required Spaces, shall be provided in each such parking area.~~

TABLE 1701.4. – Required Spaces	
Total Parking	Required Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus for 1 each 100 over 1000

1701.5. ***Limitations on Parking Lot Use.*** The following limitations apply to all parking lots:

1701.5.1. ***Private Passenger Vehicle.*** The off-street parking lot shall be used solely for parking of private passenger vehicles for periods of less than one (1) day.

1701.3.5.2. ***Vehicle Repairs.*** The repair of vehicles, and the storage of merchandise, motor vehicles or trucks is prohibited.

1701.5.3. ***Signs.*** No signs of any kind other than signs designating entrances, exits, and conditions of use shall be erected within the parking lot.

1701.6. ***Nonspecified Uses.*** For those uses not specifically mentioned, the requirements for off-street parking facilities shall be in accord with a use which the Code Official considers similar in type.

Section 1702. - Parking Space Requirements.

1702.1. ***Required NumberOff-Street Parking Spaces.*** The number of off-street parking spaces required for each use permitted by this Code properties with residential dwelling units shall not be less than that found indicated in Table 1702.1. Off-Street Parking Schedule, provided that any fractional parking space be computed as a whole space. Minimum required off-street parking spaces shall not be replaced by any other use unless and until equal parking facilities are provided elsewhere. Off-street parking existing at the effective date of this Ordinance, in

~~connection with the operation of the building or use, shall not be reduced to an amount less than hereinafter required for a similar new building or new use.~~

TABLE 1702.1. – Off-Street Parking Schedule	
Residential Use	**Number of Spaces Required**
Single Family and Duplexes	2 per unit
Multi-Family – Studio & One-Bedroom Units	1 per unit
Multi-Family – Two-Bedroom Units	1.25 per unit
Multi-Family – Three or more-Bedroom Units	1.5 per unit
Multi-Family – Senior Citizen	1 per unit

~~**1702.2.** ***Combination of Uses.*** Where there is a combination of uses on a lot, the required number of parking spaces shall be the sum of that found for each use.~~

~~TABLE 1702 – Off-street Parking Schedule~~	
~~**Use**~~	~~**Number of Parking Spaces Required**~~
~~Dwelling units~~	~~2/dwelling unit~~
~~Bed and Breakfast~~	~~2/operated use and 1/bed and breakfast sleeping room~~
~~Library, Museum, Post Office~~	~~1/150 s.f. of usable floor area~~
~~Bowling alley~~	~~5/for each one bowling lane~~
~~Adult foster care home~~	~~1/3 residents~~
~~Child care center~~	~~1/10 children~~
~~Residential care and treatment facilities~~	~~1/3 beds~~
~~Independent living~~	~~1/unit~~
~~High school~~	~~8/each classroom - 1/each employee~~
~~Colleges~~	~~7/10 students (maximum of 22 spaces for each classroom, whichever is more restrictive) - 1/each employee~~
~~All other schools~~	~~1.5/classroom~~
~~Places of worship~~	~~1/3 seats in main area of worship~~
~~Hospitals~~	~~1/bed plus 1/employee on a major shift~~
~~Grocery and all other uses~~	~~1/300 s.f. of usable floor area~~
~~Office~~	~~1/300 s.f of usable floor area~~
~~Retail~~	~~1/200 s.f. of usable floor area~~
~~Marinas~~	~~1/boat slip~~

~~Restaurant~~	~~1/100 s.f. of usable floor area~~
~~Health club~~	~~1/100 s.f. of usable floor area~~
~~Warehouse~~	~~1/1500 gross s.f.~~
~~Assembly~~	~~1/300 s.f. of usable floor area~~
~~Medical Office~~	~~1/300 s.f. of usable floor area (maximum 1/150 s.f.)~~
~~Theaters/Auditoriums~~	~~1/3 seats~~
~~Hotels/Motels~~	~~1/guest room plus 1/500 s.f. of common area~~
~~Industrial~~	~~1/500 s.f. of usable floor area~~
~~**Downtown Development District Residential Parking:**~~	
~~Single-Family Detached~~	~~2/per dwelling~~
~~Multiple Unit Dwelling;~~	
~~• One-bedroom or studio unit~~	~~1/per dwelling unit~~
~~• Two-Bedroom Unit~~	~~1.25/per dwelling unit~~
~~• Three-Bedroom Unit or More~~	~~1.5/per dwelling unit~~
~~Senior Citizen - Residential~~	~~1/per dwelling/room unit~~
~~Senior Citizen Residential - Employee~~	~~1/per employee~~

1702.3. ***Shared Parking, Off-Site Parking and Lot Location.*** The Planning Commission can approve shared parking, off-site parking and alternative lot locations for all uses other than single-family and two-family dwellings provided:

a. A shared parking and/or off-site parking study is conducted by a qualified traffic engineer based upon shared parking principles and methodologies found in the latest edition of "Shared Parking", by the Urban Land Institute.

b. The parking study demonstrates that shared parking or off-site parking will be beneficial rather than detrimental to the proposed use, surrounding area and the community.

c. The shared parking and/or off-site parking arrangement increases the availability of spaces from the existing parking supply, reduces demand for parking, or creates a more cost-effective and environmentally sensitive parking lot.

d. That a shared parking/off-site parking arrangement has a written lease or written shared parking agreement which includes a provision that requires notification to the zoning official of any change in terms or expiration of a lease or written agreement. The written agreement must be notarized and recorded with the Delta County Register of Deeds.

e. The required amount of off-street parking spaces are not reduced to an amount less than required for a new building or new use.

f. All off-street parking required to meet the standards of the Section are provided within the same zoning district as the principal use and are within a convenient walking distance of the building entrances, but no more than three hundred (300) feet from the property lot line, except that valet parking may be provided elsewhere.

g. Any proposed shared parking and/or off-site parking approvals do not represent a waiver of requirements and meet or exceed the "spirit" of the law.

1702.4. Barrier-Free Parking Required. Each parking lot that services a building entrance, except single- or two-family residential, shall provide barrier free parking spaces which shall be located as close as possible to walkways and entrances. All parking lots shall be designed in conformance with Michigan State Act No. 1 of the Public Acts of 1996 and to the Americans with Disabilities Act, as summarized in the Table 1702.4 below.

TABLE 1702~~1~~.4. – Barrier-Free Parking Requirements	
Total Spaces ~~Required~~Provided	**Barrier-Free Spaces Required**
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus for 1 each 100 over 1,000

Section 1703. - Parking ~~Stall Dimension~~Layout and Design.

~~**1703.1. *Width.*** A minimum width of nine (9) feet shall be provided for each parking stall.~~

~~*Exceptions:*~~

~~A. The width of a parking stall shall be increased twelve (12) inches for obstructions located on either side of the stall within fourteen (14) feet of the access aisle.~~

~~**1703.2. *Length.*** A minimum length of twenty (20) feet shall be provided for each parking stall.~~

1703.1~~3~~. *~~Maneuvering/Aisle Widths. Plans for the layout of the parking lot shall describe the dimensions of the total lot, and shall describe the location and dimensions of all parking spaces, maneuvering lanes, entrances, exits and setbacks. One (1) of the following various patterns shall be used:~~ Parking Layout Requirements.* Plans for the layout of the parking lot shall show the dimensions of the total lot, shall show the location and dimensions of all parking

spaces, maneuvering lanes, entrances, exits, borders, and snow storage areas. One of the following patterns shall be used for the layout of the parking spaces:

~~Parking Angle~~	~~Stall Width~~	~~Maneuvering Lanes~~	~~Parking Stall Length~~
~~0° to 15°~~	~~10 ft.~~	~~12 ft.~~	~~23 ft.~~
~~16° to 37°~~	~~10 ft.~~	~~12 ft.~~	~~20 ft.~~
~~38° to 57°~~	~~10 ft.~~	~~15 ft.~~	~~20 ft.~~
~~58° to 74°~~	~~10 ft.~~	~~18 ft.~~	~~20 ft.~~
~~75° to 90°~~	~~10 ft.~~	~~24 ft.~~	~~20 ft.~~

Table 1703.1 – Minimum Parking Layout Dimension Requirements			
Angle (in Degrees)	Min. Stall Length	Min. Stall Width	Min. Maneuvering Lane Width
0 (Parallel)	23 ft.	9 ft.	12 ft. (one way)
30-53	20 ft.	9 ft.	15 ft. (one way)
54-74	20 ft.	9 ft.	18 ft. (one way)
75-90	20 ft.	9 ft.	24 ft. (two say)

1703.2. ***Snow Storage.*** An area equivalent to 10% of the provided parking area must be designated for snow storage. The snow storage area shall be landscaped and shall be located within any fence bounding the parking lot. The snow storage area may be located in a landscape area or in a storm water detention or retention pond, subject to approval by the City.

1703.3.~~4.~~ ***Maneuvering Lane Access.*** All spaces shall be provided adequate access by means of a maneuvering lane. Backing directly onto a street is prohibited.

1703.4. ***Location.*** An off-street parking area may be located in a front, side, or rear yard setback area, except in the E3 Central Commercial District in which parking areas shall be located in the rear yard only and are prohibited in the front yard and side yards.

~~**1703.5.** ***Maneuvering Lane Widths.*** All maneuvering lane widths with the exception of the seventy-five (75) to 90-degree pattern shall be for one-way traffic movement. These widths shall be increased to a minimum twenty-four (24) feet to permit two-way movement of traffic.~~

~~**1703.6.** ***Compact-to-standard stall ratio.*** The maximum ratio of compact stalls to standard stalls in any parking area shall not exceed one (1) to two (2).~~

Section 1704. - Driveways, Street and Access Management.

1704.1. ***Driveway, Street and Access Management.*** Adequate ingress and egress to the parking lot and/or property by means of clearly limited and defined drives shall be provided for all vehicles. The number of commercial driveways serving a property shall be the minimum number necessary to provide reasonable access and access for emergency vehicles, while preserving

traffic operations and safety along the public roadway. Access may be via an individual access point or shared access along a service drive.

1704.1.1. ***Special Access Points; Lincoln Road, Ludington Street, and North 30th Street.*** One (1) access point along the corridor of Lincoln Road, Ludington Street, and North 30th Street or along connecting streets which intersect Lincoln Road, Ludington Street and North 30th Street shall be permitted for each site plan or subdivision. The Planning Commission may require shared access or access via a service drive as deemed necessary.

1704.1.2. ***Additional Access Points.*** Additional access points may be permitted if one (1) or more of the following applies:

A. One (1) additional access point along Lincoln Road, Ludington Street, and North 30th Street may be allowed for land with a continuous frontage of over five hundred (500) feet, if the Planning Commission determines there are no other reasonable access opportunities; or
B. One (1) additional access point may be allowed along streets which intersect Lincoln Road, Ludington Street, and North 30th Street for land with at least four hundred (400) feet of frontage along the street, if the Planning Commission determines there are no other reasonable access opportunities; or
C. One (1) additional access point may be allowed if the land is a corner parcel with at least three hundred (300) feet of frontage along both public streets, if the Planning Commission determines there are no other reasonable access opportunities; or
D. One-way access points are discouraged due to their conflict with the City of Escanaba goal to reduce the number of driveways/access points on Lincoln Road, Ludington Street and North 30th Street, if the Planning Commission determines there are no other reasonable access opportunities.

1704.1.3. ***Traffic Impact Study.*** The Planning Commission may determine an additional access is justified based upon a traffic impact study submitted by the applicant. The traffic impact study must be reviewed and accepted by the Michigan Department of Transportation and/or Delta County Road Commission before submittal to the Escanaba Planning Commission.

1704.1.4. ***Minimum Distance—All Other Areas.*** In all other areas of Escanaba there shall be a minimum of twenty-five (25) feet between curb cuts and intersections.

Section 1705. - Lot Access.

1705.1. ***Lot Access.*** Every lot must abut a street. No building, structure or use of land for any purpose may be placed on a lot which does not abut a street.

Exceptions:

A. A single-family detached dwelling may be constructed on a lot that does not abut a street, provided that lot is at least two (2) acres in size, is provided with access to a public street by an easement (other than an alley) of at least fifteen (15) feet in

width for the exclusive use of the detached dwelling, and the easement is maintained in a condition passable for emergency and service vehicles. All lots must be created and developed pursuant to the "Subdivision Control Act", Act 288 of the Public Acts of 1967, Act 591 of Public Acts of 1996, and Act 87 of Public Acts of 1997, as amended.

B. Attached and multi-family dwellings need not abut a street, provided that all portions of every dwelling unit are within four hundred (400) feet of a public or private street that furnishes direct access to the property and that access to each dwelling unit will be made available via either a public right-of-way or private street or vehicular or pedestrian way (other than an alley) owned by the individual unit owner in fee or in common ownership.
C. Driveways in a Light Manufacturing District and Heavy Manufacturing District may be used to provide access to uses in any of these districts which are located on lots which do not abut a street. Any such lot, which existed prior to 1997 may be used as if it abutted a street, provided that it is served with a driveway built to appropriate standards located on a permanent, recorded easement.
D. Nothing in this section exempts any property from the provisions of the Subdivision Ordinance and/or the Subdivision Control Act. In any case, when there appears to be contradicting or overlapping standards or requirements, the more restrictive standard or requirement will control.
E. Lots or building sites which are part of a large nonresidential development, such as a shopping center, need not abut a street so long as the overall site abuts a street and is designed in such a manner and way that access is furnished to all interior lots or building sites.

Section 1706. - Design of Parking Facilities.

1706.1. ***Driveway width.*** Every parking facility shall be provided with one (1) or more access driveways, the width of which shall be the following:

1706.1.1. Private driveways at least twelve (12) feet with a maximum of thirty (30) feet at the curb.

1706.1.2. Commercial driveways:

A. At least twelve (12) feet but no more than thirty-six (36) feet for one-way enter/exit.
B. Twenty-four (24) feet for two-way enter/exit.

1706.2. ***Driveway and ramp slopes.*** The maximum slope of any drive or ramp shall not exceed twenty (20) percent. Transition slopes in driveways and ramps shall be provided in accordance with the standards set by the Michigan Department of Transportation (MDOT) specifications.

1706.3. ***Stall accessibility.*** Each required parking stall shall be individually and easily accessible. No automobile shall be required to back onto any public street or sidewalk to leave any parking stall when such stall serves more than two (2) dwelling units or other than residential uses. All

portions of a public lot or garage shall be accessible to other portions thereof without requiring the use of any public street.

1706.4. ***Screening.*** A four-foot high screen at the public way shall be provided for all parking areas of five (5) or more parking spaces. An off-street parking lot abutting a residential district shall be provided with a four-foot continuous screen. The screen shall be provided on all sides where the abutting zoning district is designed as a residential district.

1706.5. ***Paving.*** ~~In a Residential Planned Unit Development District, Local Business District, Commercial District, Planned Commercial Development District, Special Planned District, Light Manufacturing District, Industrial Park District, Heavy Manufacturing District, and Open Space District~~ Except for those parking areas serving a single- or two-family dwelling, the entire parking lot, including parking spaces and maneuvering lanes ~~required under this chapter~~, shall be provided with a paved surface. For Bed and Breakfast establishments and rooming houses the parking area shall be surfaced before the permit/license is issued. Off-street parking lots shall be drained so as to dispose of all surface water accumulated in the parking areas in such a way as to preclude drainage of water onto adjacent property or toward buildings.

1706.6. ***Bumper Stops and Paint Striping.*** All parking spaces shall be clearly defined by use of carwheel or bumper stops and/or painted striped lines.

Exception: A private garage or parking area for the exclusive use of a single-family or two-family dwelling.

1706.7. ***Lighting.*** All lights illuminating a parking area shall be designed and located so as to reflect down and away from any public right-of-way and adjacent property. In no case may the source of light exceed thirty (30) feet in overall height above ground level.

1706.8. ***Separation from Residential Districts.*** The parking area must be separated from the contiguous residential district ~~area~~ by a fence or hedge. A fence shall have a minimum height of four (4) feet and be constructed of boards, pickets, stone or other suitable material equivalent thereto, with a maximum open area of fifty (50) percent. A hedge shall not be less than four (4) feet in height and be composed of at least one (1) hedge row of hardy shrubs or two (2) rows of evergreens.

Section 1707. - Off-street Loading Zones.

1707.1. ***General.*** On the same site with every building or structure with non-residential uses, ~~in all districts, excepting districts "A", "B", and "C",~~ there shall be provided and maintained a minimum of one (1) space for standing, loading, and unloading of delivery vehicles in order to prevent interference with public use of a dedicated right-of-way.

1707.1.1. **Joint Loading Spaces.** ~~***Shared Facilities.***~~ Two (2) or more adjacent buildings or ~~structures~~ lots may jointly share off-street loading facilities, provided that adequate access to the individual uses is provided.

1707.1.2. ***Loading Dock Surface.*** Loading dock approaches shall be provided with a pavement having an asphaltic or cement binder so as to provide a permanent, durable and dust-free surface.

1707.1.3. ***Dimensions.*** All spaces shall be laid out in the dimensions of at least ten (10) feet by fifty (50) ~~eighty (80)~~ feet, with a minimum clearance of fourteen (14) feet. If the site cannot reasonably accommodate loading area of the required size, the Planning Commission may consider temporary loading area alternatives pursuant to the standards of Section 1701.1.6.

1707.1.4. ***Off-Street Parking Spaces.*** Off-street parking spaces must be provided for all commercial vehicles owned by or customarily used by the business or industry. The Code Official may authorize that the off-street loading area be used for this purpose, provided that the parking of commercial vehicles does not interfere with the loading activities.

1707.1.5. ***Off-Street Loading Zone Signs.*** Off-street loading zones shall be designated with appropriate signs and pavement markings which prohibit parking of noncommercial vehicles.

1701.1.6. ***Temporary Loading Area Alternatives.*** Where the site cannot reasonably accommodate a loading space, the Planning Commission may permit a temporary loading area in parking spaces or on one (1) side of a two-way maneuvering lane, provided the temporary loading area is clearly shown on the plans, includes a sign state the permitted time of loading/unloading, is not located in an area that is hazardous to traffic safety, and does not prevent emergency vehicle access.

Section 1708. - Parking Lot/Loading Dock Maintenance.

1708.1. ***Parking Maintenance.*** The off-street parking lot, required borders and landscaped areas shall be maintained in a litter free condition. All plantings shall be in a healthy growing condition, neat and orderly in appearance. Snow shall be removed as necessary to permit use of all required parking spaces.

Section 1709. - Bicycle Parking.

1709.1. ***General.*** ~~Whenever full off-street parking compliance is required, bicycle racks or lockers must be installed and located within fifty (50) feet of the main entrance of a building or inside a building in a location that is easily accessible by bicyclists according to the table below. All requirements are minimums unless otherwise noted.~~ For new developments, on-site bicycle parking is required according to Table 1709.1. No bicycle parking is required for uses not listed.

TABLE 1709.1. - BICYCLE PARKING SCHEDULE	
Use	**Number of Spaces Required**
Hospitals	2 per 15,000 s.f. of usable floor area

Dormitories	1 per 8 residents
Churches	2 per 15,000 s.f. of usable floor area
Public libraries	1 per 25 motor vehicles spaces
Museums	2 per 15,000 s.f. of usable floor area
High school	2 per classroom
College	5 per classroom
Other schools	10 per classroom
Community buildings	1 per 25 motor vehicle spaces
Clubs	1 per 25 vehicles spaces
Commercial and Office Use	2 per 15,000 s.f. of usable floor area
Commercial outdoor recreation	1 per 20 motor vehicle spaces
Parking area 21 spaces or larger	1 per 25 motor vehicle spaces
Larger manufacturing	2 per 20,000 s.f. of usable floor area
Restaurants	2 per 16 fixed seats

1709.2. ***Fractional Space Determination.*** When units of measurement determining the number of parking spaces results in a fractional space, any fraction up to and including one-half (½) shall be disregarded and fractions over one-half (½) shall require one (1) parking space.

Section 1710. - Bicycle Parking Standards.

1710.1. ***Bicycle Lockers.*** ~~Where bicycle parking is required, all b~~Bicycle lockers ~~and bicycle racks~~ must be securely anchored.

1710.2. ***Bicycle Racks.*** **Required** bicycle parking racks must meet the following standards:

1710.2.1. ***Security.*** The bicycle frame and one (1) wheel can be locked to the rack with a high security, U-shape shackle lock if both wheels are left on the bicycle.

1710.2.2. ***Damage Control.*** A bicycle six (6) feet long can be securely held with its frame supported so that the bicycle cannot be pushed or fall in a manner that will damage the wheels or components.

1710.2.3. ***Anchoring.*** The rack must be securely anchored.

1710.3. ***Maneuvering Areas.*** The following maneuvering areas must be provided:

1710.3.1. ***Accessibility.*** Each required bicycle parking space must be accessible without moving another bicycle; and

1710.3.2. ***Aisle Maneuvering.*** There must be an aisle at least five (5) feet wide behind all required bicycle parking to allow room for bicycle maneuvering.

Section 1711. - Pedestrian Travelways (Sidewalks).

1711.1. ***Public Sidewalks.*** Six (6) feet wide public sidewalks shall be installed along streets adjacent to property at the time of development or redevelopment ~~on which a building is erected or moved~~.

1711.2. ***Private Sidewalks.*** A sidewalk a minimum of six (6) feet wide free from obstructions shall be constructed from the public sidewalk to main entries of buildings. On lots where there are multiple principal buildings or entries, sidewalks meeting the requirements above shall be provided.

Exception: One and two-family dwellings.

1711.2.1. ***One- and Two-Family Dwelling Private Sidewalks.*** A sidewalk a minimum of three (3) feet wide free from obstructions shall be constructed from the public sidewalk to main entries of all newly constructed one- and two-family dwellings.

1711.3. ***Sidewalk Separation.*** Sidewalks shall be physically separate from the parking area except where they cross a vehicle maneuvering lane, in which case the travelway shall be defined with a separate and contrasting material such as the use of textured concrete or brick paver.

Section 1712. - Modifications to Parking Requirements.

1712.1. ***General.*** Modification requests to parking requirements shall be referred to the Planning Commission for review, with a recommendation to modify the requirements as set forth in this chapter where unusual difficulties or unnecessary hardships would result. ~~However, no modification shall be given to avoid the purpose of the chapter to provide a minimum of off street parking spaces.~~

ORDINANCE NO. 1253

AN ORDINANCE TO AMEND CHAPTER XVII OF APPENDIX A AS CODIFIED UNDER THE CODE OF ORDINANCES

THE CITY OF ESCANABA HEREBY ORDAINS:

CHAPTER I

Chapter XVII of Appendix A as codified under the Code of Ordinances shall be amended to read as follows:

CHAPTER 17 - PARKING AND CIRCULATION REQUIREMENTS

Section 1701. – Off-street Parking.

1701.1. ***Purpose.*** It is hereby determined that the provision for off-street parking spaces for properties with residential dwelling units is necessary to reduce traffic hazards and the congestion of streets. It is also determined that regulation of location, design, maintenance, and other features of off-street parking lots is in the interest of public safety and welfare.

1701.2. ***Compliance.*** Off-street parking must be provided for all properties with residential dwelling units in all districts as follows, except those properties zoned as E3 Central Commercial are exempt from providing off-street parking.

1701.2.1. ***Required Parking.*** There shall be provided at the time of erection or enlargement of any structure containing a dwelling unit, off-street parking space with adequate access to all spaces.

1701.2.2. ***Remodeling/Rebuilding.*** No additional parking space need be provided when remodeling or rebuilding of existing structures, provided the usable floor area is not increased in the remodeling or rebuilding. Where floor area is increased, parking space shall be provided for such increased floor area in accordance with the provisions of this Ordinance.

1701.2.3. ***Change of Use.*** Whenever the use of an existing building is changed to a category or classification which requires more parking than the former established use, the additional demand for parking spaces created by the use change shall be provided for. Also, whenever a business use is changed to a residential use, the minimum on-site parking requirements shall be provided.

1701.3. ***Vehicle Repairs.*** The repair of vehicles, and the storage of merchandise, motor vehicles or trucks is prohibited.

Section 1702. – Parking Space Requirements.

1702.1. ***Required Off-Street Parking Spaces.*** The number of off-street parking spaces required for properties with residential dwelling units shall not be less than indicated in Table 1702.1. Off-Street Parking Schedule, provided that any fractional parking space be computed as a whole space.

TABLE 1702.1. – Off-Street Parking Schedule	
Residential Use	**Number of Spaces Required**
Single Family and Duplexes	2 per unit
Multi-Family – Studio & One-Bedroom Units	1 per unit

Multi-Family – Two-Bedroom Units	1.25 per unit
Multi-Family – Three or more-Bedroom Units	1.5 per unit
Multi-Family – Senior Citizen	1 per unit

1702.3. ***Shared Parking, Off-Site Parking and Lot Location.*** The Planning Commission can approve shared parking, off-site parking, and alternative lot locations for all uses other than single-family and two-family dwellings provided:

a. A shared parking and/or off-site parking study is conducted by a qualified traffic engineer based upon shared parking principles and methodologies found in the latest edition of "Shared Parking", by the Urban Land Institute.
b. The parking study demonstrates that shared parking or off-site parking will be beneficial rather than detrimental to the proposed use, surrounding area and the community.
c. The shared parking and/or off-site parking arrangement increases the availability of spaces from the existing parking supply, reduces demand for parking, or creates a more cost-effective and environmentally sensitive parking lot.
d. That a shared parking/off-site parking arrangement has a written lease or written shared parking agreement which includes a provision that requires notification to the zoning official of any change in terms or expiration of a lease or written agreement. The written agreement must be notarized and recorded with the Delta County Register of Deeds.
e. The required amount of off-street parking spaces are not reduced to an amount less than required for a new building or new use.
f. All off-street parking required to meet the standards of the Section are provided within the same zoning district as the principal use and are within a convenient walking distance of the building entrances, but no more than three hundred (300) feet from the property lot line, except that valet parking may be provided elsewhere.
g. Any proposed shared parking and/or off-site parking approvals do not represent a waiver of requirements and meet or exceed the "spirit" of the law.

1702.4. **Barrier-Free Parking Required.** Each parking lot that services a building entrance, except single- or two-family residential, shall provide barrier free parking spaces which shall be located as close as possible to walkways and entrances. All parking lots shall be designed in conformance with Michigan State Act No. 1 of the Public Acts of 1996 and to the Americans with Disabilities Act, as summarized in the Table 1702.4 below.

TABLE 1702.4. – Barrier-Free Parking Requirements

Total Spaces Provided	Barrier-Free Spaces Required
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6

201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus for 1 each 100 over 1,000

Section 1703.- Parking Layout and Design.

1703.1. ***Parking Layout Requirements.*** Plans for the layout of the parking lot shall show the dimensions of the total lot, shall show the location and dimensions of all parking spaces, maneuvering lanes, entrances, exits, borders, and snow storage areas. One of the following patterns shall be used for the layout of the parking spaces:

Table 1703.1 – Minimum Parking Layout Dimension Requirements

Angle (in Degrees)	Min. Stall Length	Min. Stall Width	Min. Maneuvering Lane Width
0 (Parallel)	23 ft.	9 ft.	12 ft. (one way)
30-53	20 ft.	9 ft.	15 ft. (one way)
54-74	20 ft.	9 ft.	18 ft. (one way)
75-90	20 ft.	9 ft.	24 ft. (two say)

1703.2. ***Snow Storage.*** An area equivalent to 10% of the provided parking area must be designated for snow storage. The snow storage area shall be landscaped and shall be located within any fence bounding the parking lot. The snow storage area may be located in a landscape area or in a storm water detention or retention pond, subject to approval by the City.

1703.3. ***Maneuvering Lane Access.*** All spaces shall be provided adequate access by means of a maneuvering lane. Backing directly onto a street is prohibited.

1703.4. ***Location.*** An off-street parking area may be located in a front, side, or rear yard setback area, except in the E3 Central Commercial District in which parking areas shall be located in the rear yard only and are prohibited in the front yard and side yards.

Section 1704.- Driveways, Street and Access Management.

1704.1. ***Driveway, Street and Access Management.*** Adequate ingress and egress to the parking lot and/or property by means of clearly limited and defined drives shall be provided for all vehicles. The number of commercial driveways serving a property shall be the minimum number necessary to provide reasonable access and access for emergency vehicles, while preserving traffic operations and safety along the public roadway. Access may be via an individual access point or shared access along a service drive.

1704.1.1. ***Special Access Points; Lincoln Road, Ludington Street, and North 30th Street.*** One (1) access point along the corridor of Lincoln Road, Ludington Street, and North 30th Street or along connecting streets which intersect Lincoln Road, Ludington Street and North 30th Street shall be permitted for each site plan or subdivision. The Planning

Commission may require shared access or access via a service drive as deemed necessary.

1704.1.2. ***Additional Access Points.*** Additional access points may be permitted if one (1) or more of the following applies:

A. One (1) additional access point along Lincoln Road, Ludington Street, and North 30th Street may be allowed for land with a continuous frontage of over five hundred (500) feet, if the Planning Commission determines there are no other reasonable access opportunities; or
B. One (1) additional access point may be allowed along streets which intersect Lincoln Road, Ludington Street, and North 30th Street for land with at least four hundred (400) feet of frontage along the street, if the Planning Commission determines there are no other reasonable access opportunities; or
C. One (1) additional access point may be allowed if the land is a corner parcel with at least three hundred (300) feet of frontage along both public streets, if the Planning Commission determines there are no other reasonable access opportunities; or
D. One-way access points are discouraged due to their conflict with the City of Escanaba goal to reduce the number of driveways/access points on Lincoln Road, Ludington Street and North 30th Street, if the Planning Commission determines there are no other reasonable access opportunities.

1704.1.3. ***Traffic Impact Study.*** The Planning Commission may determine an additional access is justified based upon a traffic impact study submitted by the applicant. The traffic impact study must be reviewed and accepted by the Michigan Department of Transportation and/or Delta County Road Commission before submittal to the Escanaba Planning Commission.

1704.1.4. ***Minimum Distance—All Other Areas.*** In all other areas of Escanaba there shall be a minimum of twenty-five (25) feet between curb cuts and intersections.

Section 1705.- Lot Access.

1705.1. ***Lot Access.*** Every lot must abut a street. No building, structure or use of land for any purpose may be placed on a lot which does not abut a street.

Exceptions:

A. A single-family detached dwelling may be constructed on a lot that does not abut a street, provided that lot is at least two (2) acres in size, is provided with access to a public street by an easement (other than an alley) of at least fifteen (15) feet in width for the exclusive use of the detached dwelling, and the easement is maintained in a condition passable for emergency and service vehicles. All lots must be created and developed pursuant to the "Subdivision Control Act", Act 288 of the Public Acts of 1967, Act 591 of Public Acts of 1996, and Act 87 of Public Acts of 1997, as amended.
B. Attached and multi-family dwellings need not abut a street, provided that all portions of every dwelling unit are within four hundred (400) feet of a public or private street that furnishes direct access to the property and that access to each dwelling unit will be made available via either a public right-of-way or private street or vehicular or pedestrian way (other than an alley) owned by the individual unit owner in fee or in common ownership.
C. Driveways in a Light Manufacturing District and Heavy Manufacturing District may be used to provide access to uses in any of these districts which are located on lots which do not abut a street. Any such lot, which existed prior to 1997 may be used as if it

abutted a street, provided that it is served with a driveway built to appropriate standards located on a permanent, recorded easement.

D. Nothing in this section exempts any property from the provisions of the Subdivision Ordinance and/or the Subdivision Control Act. In any case, when there appears to be contradicting or overlapping standards or requirements, the more restrictive standard or requirement will control.

E. Lots or building sites which are part of a large nonresidential development, such as a shopping center, need not abut a street so long as the overall site abuts a street and is designed in such a manner and way that access is furnished to all interior lots or building sites.

Section 1706.- Design of Parking Facilities.

1706.1. ***Driveway width.*** Every parking facility shall be provided with one (1) or more access driveways, the width of which shall be the following:

1706.1.1. Private driveways at least twelve (12) feet with a maximum of thirty (30) feet at the curb.

1706.1.2. Commercial driveways:

A. At least twelve (12) feet but no more than thirty-six (36) feet for one-way enter/exit.

B. Twenty-four (24) feet for two-way enter/exit.

1706.2. ***Driveway and ramp slopes.*** The maximum slope of any drive or ramp shall not exceed twenty (20) percent. Transition slopes in driveways and ramps shall be provided in accordance with the standards set by the Michigan Department of Transportation (MDOT) specifications.

1706.3. ***Stall accessibility.*** Each required parking stall shall be individually and easily accessible. No automobile shall be required to back onto any public street or sidewalk to leave any parking stall when such stall serves more than two (2) dwelling units or other than residential uses. All portions of a public lot or garage shall be accessible to other portions thereof without requiring the use of any public street.

1706.4. ***Screening.*** A four-foot-high screen at the public way shall be provided for all parking areas of five (5) or more parking spaces. An off-street parking lot abutting a residential district shall be provided with a four-foot continuous screen. The screen shall be provided on all sides where the abutting zoning district is designed as a residential district.

1706.5. ***Paving.*** Except for those parking areas serving a single- or two-family dwelling, the entire parking lot, including parking spaces and maneuvering lanes, shall be provided with a paved surface. For Bed and Breakfast establishments and rooming houses the parking area shall be surfaced before the permit/license is issued. Off-street parking lots shall be drained so as to dispose of all surface water accumulated in the parking areas in such a way as to preclude drainage of water onto adjacent property or toward buildings.

1706.6. ***Bumper Stops and Paint Striping.*** All parking spaces shall be clearly defined by use of carwheel or bumper stops and/or painted striped lines.

Exception: A private garage or parking area for the exclusive use of a single-family or two-family dwelling.

1706.7. ***Lighting.*** All lights illuminating a parking area shall be designed and located so as to reflect down and away from any public right-of-way and adjacent property. In no case may the source of light exceed thirty (30) feet in overall height above ground level.

1706.8. ***Separation from Residential Districts.*** The parking area must be separated from the contiguous residential district by a fence or hedge. A fence shall have a minimum height of four (4) feet and be constructed of boards, pickets, stone, or other suitable material equivalent thereto, with a maximum open area of fifty (50) percent. A hedge shall not be less than four (4) feet in height and be composed of at least one (1) hedge row of hardy shrubs or two (2) rows of evergreens.

Section 1707.- Off-street Loading Zones.

1707.1. ***General.*** On the same site with every building or structure with non-residential uses, there shall be provided and maintained a minimum of one (1) space for standing, loading, and unloading of delivery vehicles in order to prevent interference with public use of a dedicated right-of-way.

1707.1.1. Joint Loading Spaces. Two (2) or more adjacent buildings or lots may jointly share off-street loading facilities, provided that adequate access to the individual uses is provided.

1707.1.2. ***Loading Dock Surface.*** Loading dock approaches shall be provided with a pavement having an asphaltic or cement binder so as to provide a permanent, durable and dust-free surface.

1707.1.3. ***Dimensions.*** All spaces shall be laid out in the dimensions of at least ten (10) feet by fifty (50) feet, with a minimum clearance of fourteen (14) feet. If the site cannot reasonably accommodate loading area of the required size, the Planning Commission may consider temporary loading area alternatives pursuant to the standards of Section 1701.1.6.

1707.1.4. ***Off-Street Parking Spaces.*** Off-street parking spaces must be provided for all commercial vehicles owned by or customarily used by the business or industry. The Code Official may authorize that the off-street loading area be used for this purpose, provided that the parking of commercial vehicles does not interfere with the loading activities.

1707.1.5. ***Off-Street Loading Zone Signs.*** Off-street loading zones shall be designated with appropriate signs and pavement markings which prohibit parking of noncommercial vehicles.

1701.1.6. ***Temporary Loading Area Alternatives.*** Where the site cannot reasonably accommodate a loading space, the Planning Commission may permit a temporary loading area in parking spaces or on one (1) side of a two-way maneuvering lane, provided the temporary loading area is clearly shown on the plans, includes a sign state the permitted time of loading/unloading, is not located in an area that is hazardous to traffic safety, and does not prevent emergency vehicle access.

Section 1708.- Parking Lot/Loading Dock Maintenance.

1708.1. ***Parking Maintenance.*** The off-street parking lot required borders and landscaped areas shall be maintained in a litter free condition. All plantings shall be in a healthy growing condition, neat and orderly in appearance. Snow shall be removed as necessary to permit use of all required parking spaces.

Section 1709.- Bicycle Parking.

1709.1. ***General.*** For new developments, on-site bicycle parking is required according to Table 1709.1. No bicycle parking is required for uses not listed.

TABLE 1709.1. - BICYCLE PARKING SCHEDULE

Use	Number of Spaces Required
Hospitals	2 per 15,000 s.f. of usable floor area
Dormitories	1 per 8 residents
Churches	2 per 15,000 s.f. of usable floor area
Public libraries	1 per 25 motor vehicles spaces
Museums	2 per 15,000 s.f. of usable floor area
High school	2 per classroom
College	5 per classroom
Other schools	10 per classroom
Community buildings	1 per 25 motor vehicle spaces
Clubs	1 per 25 vehicles spaces
Commercial and Office Use	2 per 15,000 s.f. of usable floor area
Commercial outdoor recreation	1 per 20 motor vehicle spaces
Parking area 21 spaces or larger	1 per 25 motor vehicle spaces
Larger manufacturing	2 per 20,000 s.f. of usable floor area
Restaurants	2 per 16 fixed seats

1709.2. ***Fractional Space Determination.*** When units of measurement determining the number of parking spaces results in a fractional space, any fraction up to and including one-half (½) shall be disregarded and fractions over one-half (½) shall require one (1) parking space.

Section 1710.- Bicycle Parking Standards.

1710.1. ***Bicycle Lockers.*** Bicycle lockers must be securely anchored.

1710.2. ***Bicycle Racks.*** **Required** bicycle parking racks must meet the following standards:

1710.2.1. ***Security.*** The bicycle frame and one (1) wheel can be locked to the rack with a high security, U-shape shackle lock if both wheels are left on the bicycle.

1710.2.2. ***Damage Control.*** A bicycle six (6) feet long can be securely held with its frame supported so that the bicycle cannot be pushed or fall in a manner that will damage the wheels or components.

1710.2.3. ***Anchoring.*** The rack must be securely anchored.

1710.3. ***Maneuvering Areas.*** The following maneuvering areas must be provided:

1710.3.1. ***Accessibility.*** Each required bicycle parking space must be accessible without moving another bicycle; and

1710.3.2. ***Aisle Maneuvering.*** There must be an aisle at least five (5) feet wide behind all required bicycle parking to allow room for bicycle maneuvering.

Section 1711. – Pedestrian Travelways (Sidewalks).

1711.1. ***Public Sidewalks.*** Six (6) feet wide public sidewalks shall be installed along streets adjacent to property at the time of development or redevelopment.

1711.2. ***Private Sidewalks.*** A sidewalk a minimum of six (6) feet wide free from obstructions shall be constructed from the public sidewalk to main entries of buildings. On lots where there are multiple principal buildings or entries, sidewalks meeting the requirements above shall be provided.

Exception: One and two-family dwellings.

1711.2.1. ***One- and Two-Family Dwelling Private Sidewalks.*** A sidewalk a minimum of three (3) feet wide free from obstructions shall be constructed from the public sidewalk to main entries of all newly constructed one- and two-family dwellings.

1711.3. ***Sidewalk Separation.*** Sidewalks shall be physically separate from the parking area except where they cross a vehicle maneuvering lane, in which case the travelway shall be defined with a separate and contrasting material such as the use of textured concrete or brick paver.

Section 1712.- Modifications to Parking Restrictions.

1712.1. ***General.*** Modification requests to parking requirements shall be referred to the Planning Commission for review, with a recommendation to modify the requirements as set forth in this chapter where unusual difficulties or unnecessary hardships would result.

CHAPTER II
SAVINGS CLAUSE

If any section, subsection, sentence, clause, or phrase of this Ordinance is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this Ordinance.

The City Council hereby declares that it would have passed this Ordinance, section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared unconstitutional.

CHAPTER III
CONFLICTING ORDINANCES REPEALING CLAUSE

All Ordinances or parts of Ordinances in conflict with the provisions of this Ordinance are hereby repealed.

CHAPTER IV
EFFECTIVE DATE

This Ordinance shall be in full force and effect ten (10) days after its passage and publication.

APPROVED:

John M. A. Bergman
City Attorney

APPROVED:

Marc D. Tall
Mayor

Ordinance No. 1253

Date Approved: (Month) (Date), 2021 Attest

Date Published: (Month) (Date), 2021

Phil DeMay
City Clerk

I hereby certify that the foregoing constitutes a true and complete copy of an ordinance duly adopted by the City Council of the City of Escanaba, County of Delta, Michigan at a Regular Meeting held on the (date) day of (Month), 2021 and was published in the Daily Press, a newspaper of general circulation in the City of Escanaba on (Day), (Month) (Date), 2021, and said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

Phil DeMay
City Clerk

Agenda Item: NB-2
Date: 08-05-2021

City Council Agenda Item Request

Date: 07/14/2021

Name: Melissa Becotte

Department: Controller

Item: Enhance Escanaba Agreement

Meeting date requested: 08/05/2021

Explanation for request:

Administration is seeking approval to enter into a funding agreement with Enhance Escanaba. The group will be doing beautification projects around the City. Funds have been budgeted for this expenditure.

CITY OF Escanaba

P.O. Box 948 • Escanaba, MI 49829-0948 • (906)786-9402 • fax (906) 786-4755
TDD (800) 649-3777

AGREEMENT

THE CITY OF ESCANABA

AND

Enhance Escanaba

It is agreed that Enhance Escanaba will operate as a nonprofit corporation with the sole purpose of initiating, designing, promoting, and funding beautification projects in public, private, and historical places in the City of Escanaba.

In consideration for these initiatives, the City of Escanaba will pay to Enhance Escanaba an amount not to exceed **Five Thousand Dollars ($5,000)** during the fiscal year **July 1, 2021 through June 30, 2022**, for projects fitting the above categories. Enhance Escanaba will furnish to the City, through the City Manager, notice of all projects and will report to the City Council yearly, how these funds were spent. The City of Escanaba will be acknowledged as a participant in this project.

This agreement in effective **July 1, 2021** and will terminate on **June 30, 2022**.

CITY OF ESCANABA

_____
Patrick S. Jordan, City Manager

_____
Phil Demay, City Clerk

Enhance Escanaba

_____
It's President

Agenda Item: NB-3
Date: 08-05-2021

City Council Agenda Item Request

Date: 07/27/21

Name: Kim Peterson

Department: Recreation

Item: Passing of a Resolution and Signing of a Contract

Meeting date requested: 08/05/21

Explanation for request:

Administration is recommending passing a Resolution for authorized signatures on the North City Limits Non-Motorized Pathway. Administration is recommending signing of the Contract between Michigan Department of Transportation and the City of Escanaba for the North City Limits Non-Motorized Pathway.

Excerpt of the minutes of a regular meeting of the Escanaba City Council held on August 5, 2021 at 7:00 p.m.

Present:

Absent:

"NB-3 By Council Member , seconded by Council Member ;

RESOLUTION 21-15

The City of Escanaba City Council offered the following resolution and moved for its adoption:

Be it resolved that:

Contract No. 21-5211, Control Section TAUL 21000, Job Number 207911CON; 212633CON; and 212634CON

By and between the Michigan Department of Transportation and the City of Escanaba is hereby accepted.

The following are authorized to sign the said contract:

City Manager Patrick Jordan and City Engineer/Public Works Superintendent Robert Becotte.

Upon a call of the roll, the vote was as follows:

Ayes:
Nays:

RESOLUTION DECLARED ADOPTED."

I the undersigned, being duly qualified and acting City Clerk of the City of Escanaba, do hereby certify that the foregoing constitutes a true and complete copy of a resolution adopted by the Escanaba City Council and the City of Escanaba, County of Delta, Michigan, at a regular City Council Meeting held on Thursday, August 5, 2021, and that said meeting was conducted and public notice was given pursuant to and in full compliance with the Open Meeting Act, Act 267, Public Acts of Michigan, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

_____

Phil DeMay, City Clerk

TAP

DA

Control Section	TAUL 21000
Job Number	207911CON; 212633CON; 212634CON
Project	21A0(595)(600)(601)
CFDA No.	20.205 (Highway Research Planning & Construction)
Contract No.	21-5211

PART I

THIS CONTRACT, consisting of PART I and PART II (Standard Agreement Provisions), is made by and between the MICHIGAN DEPARTMENT OF TRANSPORTATION, hereinafter referred to as the "DEPARTMENT"; and the CITY OF ESCANABA, a Michigan municipal corporation, hereinafter referred to as the "REQUESTING PARTY"; for the purpose of fixing the rights and obligations of the parties in agreeing to the following improvements, in Escanaba, Michigan, hereinafter referred to as the "PROJECT" and estimated in detail on EXHIBIT "I", dated June 1, 2021, attached hereto and made a part hereof:

PART A – JN 207911CON; 21A0(595); FEDERAL PARTICIPATION
Hot mix asphalt roadway with wide shoulders, multi-use path, concrete curb and gutter, concrete sidewalk and sidewalk ramps, pedestrian signal upgrade, permanent signing and pavement markings along Danforth Road from N 30th Street to N Lincoln Road, along the east side of N Lincoln Road from Danforth Road to 20th Avenue N, along the west side of N Lincoln Road from Danforth Road to 32nd Avenue N, along Sheridan Road from 17th Avenue N to north city limits, along 12th Avenue N from N Lincoln Road to Stephenson Avenue, along Stephenson Avenue from 12th Avenue N to 17th Avenue N and along 17th Avenue N from Stephenson Avenue to Sheridan Road; and all together with necessary related work.

PART B – JN 207911CON; 21A0(595); NO FEDERAL PARTICIPATION
Hot mix asphalt base crushing, shaping and paving along Sheridan Road from 17th Avenue N to north city limits; and all together with necessary related work.

PART C – JN 212633CON; 21A0(600); RR FORCE ACCOUNT
Installation of 3-rail flange system to accommodate asphalt crossing approach and surface placement as part of adjacent non-motorized trail construction work along Danforth Road at the crossing of the tracks of the Escanaba & Lake Superior Railroad, USDOT NI#867754J; and all together with necessary related work.

PART D – JN 212634CON; 21A0(601); RR FORCE ACCOUNT
Relocation of flashing-light signals along Sheridan Road at the crossings of the tracks of the Wisconsin Central Railroad, herein after referred to as the "RAILROAD", USDOT

NI#180560B and USDOT NI#180561H and widening of the existing main line crossing surface along Sheridan Road at USDOT NI#180561H in conjunction with adjacent road work; and all together with necessary related work.

WITNESSETH:

WHEREAS, pursuant to Federal law, monies have been provided for the performance of transportation enhancement activities; and

WHEREAS, it has been determined that the PROJECT qualifies for such funding by virtue of its direct relationship with the intermodal transportation system; and

WHEREAS, the reference "FHWA" in PART I and PART II refers to the United States Department of Transportation, Federal Highway Administration; and

WHEREAS, the PROJECT, or portions of the PROJECT, at the request of the REQUESTING PARTY, are being programmed with the FHWA, for implementation with the use of Federal Funds under the following Federal program(s) or funding:

TRANSPORTATION ALTERNATIVES PROGRAM

WHEREAS, the parties hereto have reached an understanding with each other regarding the performance of the PROJECT work and desire to set forth this understanding in the form of a written contract.

NOW, THEREFORE, in consideration of the premises and of the mutual undertakings of the parties and in conformity with applicable law, it is agreed:

1. The parties hereto shall undertake and complete the PROJECT in accordance with the terms of this contract.

The PART D of the PROJECT work will be performed by the RAILROAD pursuant to the contract #94-1046 dated September 1, 1994, by and between the DEPARTMENT and the RAILROAD, hereinafter referred to as "ADDENDUM A" and attached hereto. The REQUESTING PARTY does hereby acknowledge its acceptance of the terms of ADDENDUM A with respect to this PROJECT.

The parties agree that programming and/or authorization of the construction of the PROJECT for Federal funding does not void or compromise in any way the statutory obligations which may be imposed by safety orders issued under the authority of 1909 PA 283, 1921 PA 270,1873 PA 198, and/or 1993 PA 354, or may be imposed under 1993 PA 354.

2. The term "PROJECT COST", as herein used, is hereby defined as the cost of the physical construction necessary for the completion of the PROJECT, including costs incurred by the Escanaba & Lake Superior Railroad for the PART C portion of the PROJECT, including costs incurred by the RAILROAD for the PART D portion of the PROJECT any other costs

incurred by the DEPARTMENT as a result of this contract, except construction engineering and inspection.

No charges will be made by the DEPARTMENT to the PROJECT for any inspection work or construction engineering.

The costs incurred by the REQUESTING PARTY for preliminary engineering, construction engineering, construction materials testing, inspection, and right-of-way are excluded from the PROJECT COST as defined by this contract.

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has informed the DEPARTMENT that it adopted new administrative rules (R 325.10101, et. seq.) which prohibit any governmental agency from connecting and/or reconnecting lead and/or galvanized service lines to existing and/or new water main. Questions regarding these administrative rules should be directed to EGLE. The cost associated with replacement of any lead and/or galvanized service lines, including but not limited to contractor claims, will be the sole responsibility of the REQUESTING PARTY.

3. The DEPARTMENT is authorized by the REQUESTING PARTY to administer on behalf of the REQUESTING PARTY all phases of the PROJECT including advertising and awarding the construction contract for the PROJECT or portions of the PROJECT. Such administration shall be in accordance with PART II, Section II of this contract.

It is understood that the DEPARTMENT, by written authorization, will directly authorize the Escanaba & Lake Superior Railroad to commence performance for the PART C portion of the PROJECT and the RAILROAD for the PART D portion of the PROJECT work.

Any items of the PROJECT COST incurred by the DEPARTMENT may be charged to the PROJECT.

4. The REQUESTING PARTY, under the terms of this contract, shall:

A. At no cost to the PROJECT

(1) Design or cause to be designed the plans for the PROJECT.

(2) Appoint a project engineer who shall be in responsible charge of the PROJECT and ensure that the plans and specifications are followed.

(3) Perform or cause to be performed the construction engineering, construction materials testing, and inspection services necessary for the completion of the PROJECT.

(4) Place and maintain advance warning signs and pavement markings in full accord with the Michigan Manual of Uniform Traffic Control Devices and the provisions of 1993 PA 354 and that it will

not install, or permit to be installed, any signs, signals or markings not in conformance with the standards approved by the FHWA, pursuant to 23 USC 109(d).

(5) Perform, as may be necessary, in conjunction with the highway-railroad crossing improvement, all approach work so as to provide a smooth-riding crossing.

(6) Assume responsibility for work zone traffic control for railroad improvements by coordinating with the railroad authority as necessary to ensure appropriate traffic controls and protection during project operations in full accord with the Michigan Manual of Uniform Traffic Control Devices.

(7) Provide and maintain detour routes necessary to accommodate traffic when required during the construction of the PROJECT and ensure that these detour routes are signed in accordance with the Michigan Manual of Uniform Traffic Control Devices.

(8) Enact and enforce such ordinances or regulations as may be necessary to prohibit parking along either side of the roadway within 50 feet of the nearest rail of the grade crossing in compliance with MCL 257.674(i).

(9) Maintain the approaches and those portions of the PROJECT under the REQUESTING PARTY'S jurisdiction pursuant to the provisions of MCL 691.1402, 1993 PA 354, and the requirements of the FHWA.

B. At least 10 days prior to any ceremony to be held in connection with the PROJECT, notify the DEPARTMENT.

C. When issuing any news release or promotional material regarding the PROJECT, give the DEPARTMENT and FHWA credit for participation in the PROJECT and provide a copy of such material to the DEPARTMENT.

The REQUESTING PARTY will furnish the DEPARTMENT proposed timing sequences for trunkline signals that, if any, are being made part of the improvement. No timing adjustments shall be made by the REQUESTING PARTY at any trunkline intersection, without prior issuances by the DEPARTMENT of Standard Traffic Signal Timing Permits.

5. The PROJECT COST shall be met in accordance with the following:

PART A

Federal Funds shall be applied to the eligible items of the PART A portion of the PROJECT COST up to the lesser of: (1) $576,040, or (2) an amount such that

81.85 percent, the normal Federal participation ratio for such funds, for the PART A portion of the PROJECT is not exceeded at the time of the award of the construction contract. The balance of the PART A portion of the PROJECT COST, after deduction of Federal Funds, shall be charged to and paid by the REQUESTING PARTY in the manner and at the times hereinafter set forth.

PART B
The PART B portion of the PROJECT COST is not eligible for Federal participation and shall be charged to and paid 100 percent by the REQUESTING PARTY in the manner and at the times hereinafter set forth.

PART C
Federal Funds shall be applied to the eligible items of the PART C portion of the PROJECT COST up to the lesser of: (1) $2,938, or (2) an amount such that 81.85 percent, the normal Federal participation ratio for such funds, for the PART C portion of the PROJECT is not exceeded at the time of the award of the construction contract. The balance of the PART C portion of the PROJECT COST, after deduction of Federal Funds, shall be charged to and paid by the REQUESTING PARTY in the manner and at the times hereinafter set forth.

PART D
Federal Funds shall be applied to the eligible items of the PART D portion of the PROJECT COST up to the lesser of: (1) $112,550, or (2) an amount such that 81.85 percent, the normal Federal participation ratio for such funds, for the PART D portion of the PROJECT is not exceeded at the time of the award of the construction contract. The balance of the PART D portion of the PROJECT COST, after deduction of Federal Funds, shall be charged to and paid by the REQUESTING PARTY in the manner and at the times hereinafter set forth.

Any items of PROJECT COST not reimbursed by Federal Funds will be the sole responsibility of the REQUESTING PARTY.

6. It is understood that the Escanaba & Lake Superior Railroad and the RAILROAD, at its sole expense, pursuant to ADDENDUM A, will own, operate, and maintain the railroad facilities unless otherwise provided between the REQUESTING PARTY and the Escanaba & Lake Superior Railroad and the REQUESTING PARTY and the RAILROAD.

7. No working capital deposit will be required for this PROJECT.

In order to fulfill the obligations assumed by the REQUESTING PARTY under the provisions of this contract, the REQUESTING PARTY shall make prompt payments of its share of the PROJECT COST upon receipt of progress billings from the DEPARTMENT as herein provided. All payments will be made within 30 days of receipt of billings from the DEPARTMENT. Billings to the REQUESTING PARTY will be based upon the REQUESTING PARTY'S share of the actual costs incurred less Federal Funds earned as the PROJECT progresses.

8. It is understood that the REQUESTING PARTY is responsible for the facilities constructed as the PROJECT and that said facilities may require special or unusual operation and/or maintenance. The REQUESTING PARTY certifies, by execution of this contract, that upon completion of construction and at no cost to the PROJECT or the DEPARTMENT, it will properly maintain or provide for the maintenance and operation of the PROJECT, making ample provisions each year for the performance of such maintenance work as may be required. Upon completion of the PROJECT, the REQUESTING PARTY shall accept the facilities constructed as built to specifications within the construction contract documents.

On projects involving the mobility for bicyclists, the REQUESTING PARTY will enact no ordinances or regulations prohibiting the use of bicycles on the facility hereinbefore described as the PROJECT and will amend any existing restrictive ordinances in this regard so as to allow use of this facility by bicycles. No motorized vehicles shall be permitted on such facility constructed as the PROJECT except those for maintenance or emergency assistance purposes, or mobility for persons with disabilities.

On projects involving the restoration of historic facilities, the REQUESTING PARTY agrees that the project will not be awarded until the owner of such facilities has an Historic Preservation Covenant, which includes an Historic Preservation Easement, or an Historic Preservation Agreement, as appropriate, with the Michigan State Historic Preservation Office in accordance with 1995 PA 60 for the purpose of ensuring that the historic property will be preserved. The REQUESTING PARTY also agrees that such facilities shall be maintained and repaired by the REQUESTING PARTY or owner, as applicable, at no cost to the DEPARTMENT or the PROJECT, in such a manner as to preserve the historical integrity of features, materials, appearance, workmanship, and environment.

On projects which include landscaping, the DEPARTMENT, at PROJECT COST, agrees to perform or cause to be performed, the watering and cultivating necessary to properly establish the plantings for a period of two growing seasons, in general conformance with Section 815.03(L) of the DEPARTMENT'S Standard Specifications for Construction. The REQUESTING PARTY shall maintain all plantings following completion of said period of establishment.

In accordance with the permit issued to the REQUESTING PARTY by the DEPARTMENT, the facilities constructed as the PROJECT and allowed on state trunkline right-of-way shall be placed and maintained in a manner which will not impair the state trunkline or interfere with the reasonable safe and free flow of traffic. Should the facilities constructed as the PROJECT interfere with future trunkline highway operations or safety, the REQUESTING PARTY agrees to the modification of said facilities as required by the DEPARTMENT. The REQUESTING PARTY shall be responsible for the performance of and the costs associated with any such changes.

Failure of the REQUESTING PARTY to fulfill its responsibilities as outlined herein may disqualify the REQUESTING PARTY from future Federal aid participation in Transportation Alternatives Program projects or in other projects on roads or streets for which it has maintenance responsibility. Federal aid may be withheld until such time as deficiencies in

regulations have been corrected, and the improvements constructed as the PROJECT are brought to a satisfactory condition of maintenance.

9. The performance of the entire PROJECT under this contract, whether Federally funded or not, will be subject to the provisions and requirements of PART II that are applicable to a Federally funded project.

In the event of any discrepancies between PART I and PART II of this contract, the provisions of PART I shall prevail.

Buy America Requirements (23 CFR 635.410) shall apply to the PROJECT and will be adhered to, as applicable, by the parties hereto.

10. The REQUESTING PARTY certifies that it is not aware if and has no reason to believe that the property on which the work is to be performed under this agreement is a facility, as defined by the Michigan Natural Resources and Environmental Protection Act [(NREPA), PA 451, 1994, as amended 2012]; MCL 324.20101(1)(s). The REQUESTING PARTY also certifies that it is not a liable party pursuant to either Part 201 or Part 213 of NREPA, MCL 324.20126 et seq. and MCL 324.21323a et seq. The REQUESTING PARTY is a local unit of government that has acquired or will acquire property for the use of either a transportation corridor or public right-of-way and was not responsible for any activities causing a release or threat of release of any hazardous materials at or on the property. The REQUESTING PARTY is not a person who is liable for response activity costs, pursuant to MCL 324.20101 (vv) and (ww).

11. If, subsequent to execution of this contract, previously unknown hazardous substances are discovered within the PROJECT limits, which require environmental remediation pursuant to either state or federal law, the REQUESTING PARTY, in addition to reporting that fact to the Michigan Department of Environment, Great Lakes, and Energy, shall immediately notify the DEPARTMENT, both orally and in writing of such discovery. The DEPARTMENT shall consult with the REQUESTING PARTY to determine if it is willing to pay for the cost of remediation and, with the FHWA, to determine the eligibility, for reimbursement, of the remediation costs. The REQUESTING PARTY shall be charged for and shall pay all costs associated with such remediation, including all delay costs of the contractor for the PROJECT, in the event that remediation and delay costs are not deemed eligible by the FHWA. If the REQUESTING PARTY refuses to participate in the cost of remediation, the DEPARTMENT shall terminate the PROJECT. The parties agree that any costs or damages that the DEPARTMENT incurs as a result of such termination shall be considered a PROJECT COST.

12. If federal and/or state funds administered by the DEPARTMENT are used to pay the cost of remediating any hazardous substances discovered after the execution of this contract and if there is a reasonable likelihood of recovery, the REQUESTING PARTY, in cooperation with the Michigan Department of Environment, Great Lakes, and Energy and the DEPARTMENT, shall make a diligent effort to recover such costs from all other possible entities. If recovery is made, the DEPARTMENT shall be reimbursed from such recovery for

the proportionate share of the amount paid by the FHWA and/or the DEPARTMENT and the DEPARTMENT shall credit such sums to the appropriate funding source.

13. The DEPARTMENT'S sole reason for entering into this contract is to enable the REQUESTING PARTY to obtain and use funds provided by the Federal Highway Administration pursuant to Title 23 of the United States Code.

Any and all approvals of, reviews of, and recommendations regarding contracts, agreements, permits, plans, specifications, or documents, of any nature, or any inspections of work by the DEPARTMENT or its agents pursuant to the terms of this contract are done to assist the REQUESTING PARTY in meeting program guidelines in order to qualify for available funds. Such approvals, reviews, inspections, and recommendations by the DEPARTMENT shall not relieve the REQUESTING PARTY of its ultimate control and shall not be construed as a warranty of their propriety or that the DEPARTMENT is assuming any liability, control, or jurisdiction.

The providing of recommendations or advice by the DEPARTMENT or its agents does not relieve the REQUESTING PARTY and the local agencies, as applicable of their exclusive jurisdiction of any of their highways and responsibility under MCL 691.1402 et seq., as amended.

When providing approvals, reviews and recommendations under this contract, the DEPARTMENT or its agents is performing a governmental function, as that term is defined in MCL 691.1401 et seq., as amended, which is incidental to the completion of the PROJECT.

Upon completion of the PROJECT, the REQUESTING PARTY shall accept the facilities constructed as built to specifications within the contract documents. It is understood that the REQUESTING PARTY shall own the facilities and shall operate and maintain the facilities in accordance with applicable law.

14. The DEPARTMENT, by executing this contract, and rendering services pursuant to this contract, has not and does not assume jurisdiction of any REQUESTING PARTY highway for purposes of MCL 691.1402 et seq., as amended. Exclusive jurisdiction of such highway for the purposes of MCL 691.1402 et seq., as amended, rests with the REQUESTING PARTY and other local agencies having respective jurisdiction.

15. The REQUESTING PARTY shall approve all of the plans and specifications to be used on the PROJECT and shall be deemed to have approved all changes to the plans and specifications when put into effect. It is agreed that ultimate responsibility and control over the PROJECT rests with the REQUESTING PARTY and local agencies, as applicable.

16. The REQUESTING PARTY agrees that the costs reported to the DEPARTMENT for this contract will represent only those items that are properly chargeable in accordance with this contract. The REQUESTING PARTY also certifies that it has read the contract terms and has made itself aware of the applicable laws, regulations, and terms of this contract that apply to the reporting of costs incurred under the terms of this contract.

17. Each party to this contract will remain responsible for any and all claims arising out of its own acts and/or omissions during the performance of the contract, as provided by this contract or by law. In addition, this is not intended to increase or decrease either party's liability for or immunity from tort claims. This contract is also not intended to nor will it be interpreted as giving either party a right of indemnification, either by contract or by law, for claims arising out of the performance of this contract.

18. The parties shall promptly provide comprehensive assistance and cooperation in defending and resolving any claims brought against the DEPARTMENT by the contractor, vendors or suppliers as a result of the DEPARTMENT'S award of the construction contract for the PROJECT. Costs incurred by the DEPARTMENT in defending or resolving such claims shall be considered PROJECT COSTS.

19. The DEPARTMENT shall require the contractor who is awarded the contract for the construction of the PROJECT to provide insurance in the amounts specified and in accordance with the DEPARTMENT'S current Standard Specifications for Construction and to:

A. Maintain bodily injury and property damage insurance for the duration of the PROJECT.

B. Provide owner's protective liability insurance naming as insureds the State of Michigan, the Michigan State Transportation Commission, the DEPARTMENT and its officials, agents and employees, the REQUESTING PARTY and any other county, county road commission, or municipality in whose jurisdiction the PROJECT is located, and their employees, for the duration of the PROJECT and to provide, upon request, copies of certificates of insurance to the insureds. It is understood that the DEPARTMENT does not assume either ownership of any portion of the PROJECT or jurisdiction of any REQUESTING PARTY highway as a result of being named as an insured on the owner's protective liability insurance policy.

C. Comply with the requirements of notice of cancellation and reduction of insurance set forth in the current standard specifications for construction and to provide, upon request, copies of notices and reports prepared to those insured.

20. This contract shall become binding on the parties hereto and of full force and effect upon the signing thereof by the duly authorized officials for the parties hereto and upon the adoption of the necessary resolutions approving said contract and authorizing the signatures thereto of the respective officials of the REQUESTING PARTY, a certified copy of which resolution shall be attached to this contract.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be executed as written below.

CITY OF ESCANABA

By_____
Title:

By _____
Title:

MICHIGAN DEPARTMENT
OF TRANSPORTATION

By _____
Department Director MDOT

REVIEWED

June 1, 2021

EXHIBIT I

CONTROL SECTION	TAUL 21000
JOB NUMBER	207911CON; 212633CON; 212634CON
PROJECT	21A0(595)(600)(601)

ESTIMATED COST

CONTRACTED WORK	PART A	PART B	PART C	PART D	TOTAL
Estimated Cost	$800,300	$155,600	$ 0	$ 0	$ 955,900
FORCE ACCOUNT WORK (by Escanaba & Lake Superior Railroad and RAILROAD thru DEPARTMENT)					
Crossing Work	$ 0	$ 0	$ 3,600	$137,600	$ 141,200
GRAND TOTAL ESTIMATED COST	$800,300	$155,600	$ 3,600	$137,600	$1,097,100

COST PARTICIPATION

GRAND TOTAL ESTIMATED COST	$800,300	$155,600	$ 3,600	$137,600	$1,097,100
Less Federal Funds*	$576,040	$ 0	$ 2,938	$112,550	$ 691,528
BALANCE (REQUESTING PARTY'S SHARE)	$224,260	$155,600	$ 662	$ 25,050	$ 405,572

*Federal Funds for the PROJECT are limited to an amount as described in Section 5.

NO DEPOSIT

ADDENDUM A

Contract #94-1046

MICHIGAN DEPARTMENT OF TRANSPORTATION

and

WISCONSIN CENTRAL, LTD.

MASTER AGREEMENT

for

HIGHWAY-RAILROAD GRADE CROSSING IMPROVEMENTS ON PUBLIC HIGHWAYS

THIS MASTER AGREEMENT, made and entered into this day of DEC 01 1994 between the Michigan Department of Transportation, hereinafter referred to as the "DEPARTMENT", and the Wisconsin Central, LTD., an Illinois Corporation, admitted to do business under the laws of the State of Michigan and other states, hereinafter referred to as the "RAILROAD".

WITNESSETH:

WHEREAS, the RAILROAD owns and operates railroad lines within the State of Michigan that cross various public highways at grade; and

WHEREAS, the public highways herein referred to include state trunkline highways under the jurisdiction of the DEPARTMENT and public highways and roadways under the jurisdiction of various counties, and incorporated cities and villages which are hereinafter referred to individually as the ROAD AUTHORITY; and

WHEREAS, the parties hereto anticipate that they and the appropriate ROAD AUTHORITY, in the interest of public safety and convenience, will desire to improve, install, modify, relocate, or retire active highway-railroad traffic control devices, and make additional improvements as may be eligible and necessary, at such highway-railroad grade crossings of the RAILROAD with public highways as shall be agreed to from time to time by the parties hereto and appropriate ROAD AUTHORITY, which improvements are hereinafter referred to individually as PROJECTS; and

WHEREAS, PROJECTS for improvements to crossings of highways or roadways which are not under the jurisdiction of the DEPARTMENT will require advance written approval by

the ROAD AUTHORITY which shall be obtained by the DEPARTMENT, and which in each instance shall include but not be limited to, acceptance of the terms of this agreement, commitment to provide such project engineering, traffic control and roadway work as is mutually determined to be required and financial participation in the overall PROJECT cost where such is required; and

WHEREAS, it is recognized that a highway grade crossing may be subject to an order issued under the provisions of Public Act 354 of 1993, cited as "the Railroad Code of 1993"; and

WHEREAS, Title 23, United States Code, as amended, provides federal funding by the Federal Highway Administration, hereinafter referred to as "FHWA" for the type of improvements contemplated herein and the State of Michigan, Act 51 of the Public Acts of 1951, as amended by Public Act 294 of 1993 provides for an annual appropriation to the state trunkline fund for subsequent deposit in the State Rail Grade Crossing Account for the type of improvements contemplated herein for all public highways; and

WHEREAS, the parties hereto have reached an understanding with each other regarding the accomplishment of such desired PROJECTS, using the aforesaid funds or other comparable federal and state program funds, and desire to set forth their understanding in the form of a written MASTER AGREEMENT.

NOW, THEREFORE, in consideration of the premises and the performance of the mutual undertakings of the parties hereto, it is agreed as follows:

1. The DEPARTMENT, in cooperation with the RAILROAD and ROAD AUTHORITY, will select and determine the scope of each PROJECT to be undertaken pursuant to this agreement and will select the type of funding to be utilized.

2. All PROJECTS to which this agreement is applied shall be subject to all appropriate federal and state laws, rules and regulations, and orders issued pursuant thereto.

3. The cost of each PROJECT is understood to include, within the limitations of each PROJECT authorization and this MASTER AGREEMENT, 100 percent of the actual cost incurred by the RAILROAD and the DEPARTMENT for labor, equipment and materials for construction, preliminary and construction engineering, inspection services and the preparation of plans, material lists, specifications and cost estimates. If federal funds are utilized, such costs shall be borne by federal funds to the extent determined by the type of federal funding selected and the classification of each PROJECT in accordance with the FHWA's Federal-Aid Policy Guide, hereinafter referred to as the "FAPG", Chapter 1, Subchapter G, Part 646, Subpart B, Sections 646.200 through 646.220, dated December 9, 1991, and amendments thereto.

4. The parties acknowledge and agree that Public Act 294 of 1993 provides for alternate PROJECT participation and that any PROJECT that includes financial participation by

the RAILROAD will require separate agreement(s) between the DEPARTMENT, RAILROAD and ROAD AUTHORITY, when necessary, in the case of a non-state trunkline project.

5. The RAILROAD will prepare necessary plans, a list of equipment, materials, specifications, and an estimate of cost for complete performance of its portion of each proposed PROJECT.

6. The DEPARTMENT, or ROAD AUTHORITY for non-state trunkline PROJECTS, will prepare a cost estimate for complete performance of its portion of each proposed PROJECT and a plan sufficient for each proposed PROJECT. The DEPARTMENT will assemble and correlate the data submitted by the RAILROAD and the ROAD AUTHORITY and will distribute the information to the parties involved in each PROJECT.

7. The DEPARTMENT will process each PROJECT with the FHWA when using federal funds or the DEPARTMENT when using state funds and, upon approval and obligation of the use of selected funds by the FHWA or the DEPARTMENT as appropriate, and execution of a contract, when required, between the DEPARTMENT and the ROAD AUTHORITY for non-state trunkline PROJECTS, will issue a formal authorization to the RAILROAD to proceed with each PROJECT. Work performed prior to such approval and funding obligation by the FHWA or DEPARTMENT, as appropriate and approval by the ROAD AUTHORITY when required, for the PROJECT ultimately covered by this agreement shall not be eligible for reimbursement except for preliminary engineering costs incurred subsequent to on-site inspections or reviews. The authorization will describe the work to be performed by each party, the estimated costs, the source of funds, the anticipated completion time period and the cost of operation and maintenance of RAILROAD facilities as provided in Section 14 hereof. Any substantial change in the PROJECT cost, scope of work or completion time period contained in the authorization will require a written revision to the authorization and, if necessary, an amendment to the contract for non-state trunkline PROJECTS.

8. The DEPARTMENT, at PROJECT expense, will provide a project engineer who shall be in charge of the PROJECT work to such extent as is necessary to meet state and federal requirements.

The ROAD AUTHORITY at no cost to the PROJECT, will provide a project engineer/manager for non-state trunkline projects.

It is understood that the RAILROAD, at PROJECT expense, will perform the construction engineering and inspection services necessary for its portion of each PROJECT.

The RAILROAD hereby agrees to contact the DEPARTMENT, and ROAD AUTHORITY for non-state trunkline projects, prior to the start of work on any PROJECT to coordinate all aspects of each PROJECT which shall include, but not be limited to, PROJECT geometrics, roadway and track lines, grades and elevations, construction details, work schedules and traffic control measures. The elevation relating to the top of rails and to the roadway shall

not be raised or lowered by either party unless provided for on the approved plans or otherwise specifically agreed to.

9. All work performed or caused to be performed, and materials furnished or caused to be furnished by the RAILROAD pursuant to a contract authorization under this agreement, will be performed on a force account basis or lump sum cost basis as stipulated in the contract authorization, billed by the RAILROAD, and reimbursed by the DEPARTMENT as defined and as provided in the FHWA's FAPG, Chapter 1, Subchapter B, Part 140, Subpart I, Sections 140.900 through 140.922, dated December 9, 1991, and amendments thereto, incorporated herein by reference as if the same were repeated in full herein.

The RAILROAD will credit to the PROJECT the value of materials recovered from temporary or permanent use on the PROJECT in accordance with the provisions of the FHWA's FAPG, Chapter 1, Subchapter B, Part 140, Subpart I, Section 140.908, dated December 9, 1991, and amendments thereto.

The RAILROAD shall afford the DEPARTMENT, the ROAD AUTHORITY, and the FHWA, if applicable, a reasonable opportunity to inspect materials recovered prior to disposal by sale or scrap.

10. Upon completion of authorized work and receipt of progress or final billings therefor, the DEPARTMENT will reimburse the RAILROAD (from funds provided therefore, and in accordance with said FAPG) withholding until the time of final payment, a retainage as hereinafter set forth in Appendix C. The retainage may be released to the RAILROAD following PROJECT acceptance by the DEPARTMENT, receipt of the RAILROAD'S all inclusive final billing, and provided the DEPARTMENT has reasonable assurance it can recover promptly any overpayment disclosed by the DEPARTMENT'S audit of the RAILROAD'S records. The RAILROAD will bear the full cost of any items for which they are responsible and which are determined to be not properly a part of the PROJECT.

11. The RAILROAD shall:

(a) Establish and maintain accurate cost records and accounts, in accordance with generally accepted accounting principles, of all costs and expenses incurred for which payment is sought or made under this agreement, said documents to be hereinafter referred to as the RECORDS. Separate RECORDS shall be established and maintained for each PROJECT authorized under this agreement.

(b) The RAILROAD shall maintain the RECORDS for at least three (3) years from the date final payment is made by the DEPARTMENT under this agreement. In the event of a dispute with regard to the allowable expenses or any other issue under this agreement, the RAILROAD shall thereafter continue to maintain the RECORDS at least until that dispute

has been finally decided and the time for all available challenges or appeals of that decision has expired.

(c) The DEPARTMENT, or its representative, may inspect, copy, or audit the RECORDS at any reasonable time after giving reasonable notice.

(d) If any part of the work is subcontracted, the RAILROAD shall assure compliance with subsections (a), (b), and (c) above for all subcontracted work.

IT IS FURTHER AGREED THAT:

In the event that an audit performed by or on behalf of the DEPARTMENT indicates an adjustment to the costs reported for any PROJECT authorized under this agreement, or questions the allowability of an item of expense, the DEPARTMENT shall promptly submit to the RAILROAD, a Notice of Audit Results and a copy of the audit report which may supplement or modify any tentative findings verbally communicated to the RAILROAD at the completion of an audit.

Within sixty (60) days after the date of the Notice of Audit Results, the RAILROAD shall: (a) provide written concurrence with the Notice of Audit Results, and/or (b) repay the amount of any overpayment to the DEPARTMENT, and/or (c) submit to the DEPARTMENT a written response to the Notice of Audit Results explaining the nature and basis for any disagreement as to a disallowed item of expense and/or, (d) submit to the DEPARTMENT a written explanation as to any questioned item of expense, hereinafter referred to as the RESPONSE. The RESPONSE shall be clearly stated and provide any supporting documentation necessary to resolve any disagreement or questioned item of expense. Where the documentation is voluminous, the RAILROAD may supply appropriate excerpts and make alternate arrangements to conveniently and reasonably make that documentation available for review by the DEPARTMENT. The RESPONSE shall refer to and apply the language of this agreement and the specific PROJECT authorization. The RAILROAD agrees that failure to submit a RESPONSE within the sixty (60) day period constitutes agreement with any disallowance of an item of expense and authorizes the DEPARTMENT to finally decide whether to allow or disallow any items of questioned cost.

The DEPARTMENT shall make its decision with regard to any Notice of Audit Results and RESPONSE within one hundred twenty (120) days after the date of the Notice of Audit Results. If the DEPARTMENT determines that an overpayment has been made to the RAILROAD, the RAILROAD shall repay that amount to the DEPARTMENT within thirty (30) days after the date of the written notice from the DEPARTMENT of that decision. If the RAILROAD fails to repay the overpayment or reach agreement with the DEPARTMENT on a repayment schedule within the thirty (30) day period, the RAILROAD agrees that the DEPARTMENT shall deduct all or a portion of the overpayment from any funds then or thereafter payable by the DEPARTMENT to the RAILROAD under other PROJECT

authorizations pertaining to this agreement, or any other agreement. The RAILROAD expressly consents to this withholding or offsetting of funds under those circumstances, reserving the right to file a lawsuit in the Court of Claims to contest the DEPARTMENT'S decision only as to any item of expense the disallowance of which was disputed by the RAILROAD in a timely filed RESPONSE.

12. The DEPARTMENT shall maintain accurate records and accounts relative to the PROJECT and upon completion of the PROJECT, payment of all items of PROJECT cost and completion of final audit by the DEPARTMENT, shall make a final accounting to the RAILROAD and the ROAD AUTHORITY.

13. All contracts with subcontractors, including amendments, shall be submitted to the DEPARTMENT for review. All subcontracts in excess of Twenty Five Thousand Dollars ($25,000.00) require formal approval by the DEPARTMENT prior to execution. Consent to sublet any portion of the PROJECT work shall not be construed to relieve the RAILROAD of any responsibility or obligation under, or for the fulfillment of a PROJECT authorization issued under this agreement.

Any such approval shall in no way be construed as a warranty of the subcontractor's qualifications, professional standing, ability to perform the work being contracted, or financial integrity.

14. Upon and after completion of the installation or improvement of active highway-railroad traffic control devices, crossing surfaces, or other RAILROAD facilities pursuant to this agreement, the RAILROAD will own, operate and maintain the same in proper working condition in accordance with Public Act 354 of 1993. Crossing surfaces installed, utilizing federal or state funds, shall be maintained for the useful life of the material. In the event that a federal or state law is hereinafter enacted which may govern the cost of operation and maintenance of such facilities, the provisions in this section of the agreement may be renegotiated by the DEPARTMENT, or ROAD AUTHORITY for non-state trunkline projects, and the RAILROAD.

15. In the event the highway is widened, or other changes made in the future which require the relocation or alteration of any active highway-railroad traffic control devices so installed, within or adjacent to the crossing area or alteration of a crossing surface becomes necessary, the expense thereof shall be borne pursuant to federal or state law applicable at the time same is to be done.

16. If at any time there shall be, at any grade crossing improved pursuant to this agreement, a separation of grades of the highway and railroad; or if, for any other reason, no further need exists for continuing operation of active highway-railroad traffic control devices or for crossing surfaces so installed, they shall be removed by the RAILROAD and may, subject to the approval of the DEPARTMENT or other ROAD AUTHORITY having jurisdiction over said highway, be reinstalled by the RAILROAD at another location to be then agreed upon, and

the cost of such removal and reinstallation and the operation and maintenance of said highway-railroad traffic control devices or crossing surfaces after completion of the installation at such location, shall be borne pursuant to federal or state law applicable at the time same is to be done.

17. This MASTER AGREEMENT may be terminated by either party upon thirty days written notice to the other party and may be amended only in writing by mutual agreement. No deletion, modification, addition to or termination of this agreement, however, shall affect any project previously authorized pursuant to this agreement.

18. Any approvals, reviews and inspections of any nature by the DEPARTMENT, shall not be construed as a warranty or assumption of liability on the part of the DEPARTMENT. It is expressly understood and agreed that any such approvals are for the sole and exclusive purposes of the DEPARTMENT, which is acting in a governmental capacity under this agreement and that such approvals are a governmental function incidental to this agreement.

Any such approvals, reviews and inspections by the DEPARTMENT will not relieve the RAILROAD of its obligations hereunder, nor are such approvals, reviews and inspections by the DEPARTMENT to be construed as a warranty as to the propriety of the RAILROAD'S performance.

19. The RAILROAD shall comply with all applicable federal, state and local laws and ordinances.

20. In connection with the performance of work under this agreement, the RAILROAD (hereinafter in Appendix A referred to as the "contractor") agrees to comply with the State of Michigan provisions for "Prohibition of Discrimination in State Contracts", as set forth in Appendix A, dated August 1985, as amended, attached hereto and made a part hereof and will require a similar covenant on the part of any contractor or subcontractor employed in the performance of this work.

21. During the performance of this agreement, the RAILROAD for itself, its assignees, and successors in interest (hereinafter in Appendix B referred to as the "contractor") agrees to comply with the Civil Rights Act of 1964, being P.L. 88-352, 78 Stat. 241, as amended, being Title 42 U.S.C. Sections 1971, 1975a-1975d, and 2000a-2000h-6 and the Regulations of the Department of Transportation (49 C.F.R. Part 21) issued pursuant to said Act, including Appendix B, dated April 1979, as amended, attached hereto and made a part hereof and will require similar covenants on the part of any contractor or subcontractor employed in the performance of this agreement.

22. The Resolution of the State Administrative Board, dated May 1, 1979, as amended, entitled "Department of Transportation Construction and Maintenance Contracts" as set forth in Appendix C, is attached hereto and made a part hereof.

23. It is the intent of the parties that nothing in this agreement shall preclude the DEPARTMENT from exercising its statutory authority in connection with public safety at highway-railroad grade crossings. The pendency of a request for funding under this agreement shall not be deemed to relieve the RAILROAD of any obligations it may have under an order from the DEPARTMENT to improve safety conditions and/or devices at a highway-railroad grade crossing.

24. This MASTER AGREEMENT shall be effective and binding upon the parties hereto, their successors and assigns, when it has been fully executed and the Administrative Board of the State of Michigan has approved this agreement and authorized the DEPARTMENT to proceed therewith.

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed by their proper and duly authorized officers.

WISCONSIN CENTRAL, LTD.

By Glenn A. Kerbs
Title Vice President-Engineering

MICHIGAN DEPARTMENT OF TRANSPORTATION

By
Department Director MDOT

REVIEWED
6-10-94
BUREAU OF FINANCE

APPROVED
State
Administrative Board
7-05-94

WISCONSIN CENTRAL LTD.

SECRETARY'S CERTIFICATE

I, Thomas W. Rissman, certify that I am the duly elected and qualified Secretary of Wisconsin Central Ltd., an Illinois corporation (the "Company"), and as such, am the keeper of the books and records of the Company. I further certify that attached to this Certificate as Annex A is a true, correct and complete copy of resolutions duly adopted by the unanimous consent of the Board of Directors of the Company as of June 27, 1994. Such resolutions have not been amended, modified or revoked and are in full force and effect on this date.

Dated: June 30, 1994.

Thomas W. Rissman
Secretary

ANNEX A

RESOLVED, that the corporation shall enter into a Master Agreement for Highway-Railroad Grade Crossing Improvements on Public Highways ("Master Agreement"), between the Michigan Department of Transportation and the corporation, in substantially the form attached to this Consent;

FURTHER RESOLVED, that the execution, delivery and performance by the corporation of the Master Agreement is approved;

FURTHER RESOLVED, that the Vice President - Engineering of the corporation is authorized and directed to execute and deliver, on behalf of the corporation, the Master Agreement; and further resolved that the appropriate officers of the corporation are authorized and directed to execute and deliver any documents, instruments or agreements and to take any actions, on behalf of the corporation, necessary or appropriate in connection with the actions contemplated by the Master Agreement.

RESOLVED, that this consent may by executed in one or more counterparts, each of which shall constitute an original, and all counterparts togerher shall be deemed one and the same instrument.

APPENDIX A
PROHIBITION OF DISCRIMINATION IN STATE CONTRACTS

In connection with the performance of work under this contract; the contractor agrees as follows:

1. In accordance with Act No. 453, Public Acts of 1976, the contractor hereby agrees not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment or as a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex height, weight, or marital status. Further, in accordance with Act No. 220, Public Acts of 1976 as amended by Act No 478, Public Acts of 1980 the contractor hereby agrees not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of a handicap that is unrelated to the individual's ability to perform the duties of a particular job or position. A breach of the above covenants shall be regarded as a material breach of this contract.

2. The contractor hereby agrees that any and all subcontracts to this contract, whereby a portion of the work set forth in this contract is to be performed, shall contain a covenant the same as hereinabove set forth in Section 1 of this Appendix.

3. The contractor will take affirmative action to insure that applicants for employment and employees are treated without regard to their race, color, religion, national origin, age, sex, height, weight, marital status or a handicap that is unrelated to the individual's ability to perform the duties of a particular job or position. Such action shall include but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

4. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight, marital status or handicap that is unrelated to the individual's ability to perform the duties of a particular job or position.

5. The contractor or his collective bargaining representative will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice advising the said labor union or workers' representative of the contractor's commitments under this appendix.

6. The contractor will comply with all relevant published rules, regulations, directives, and orders of the Michigan Civil Rights Commission which may be in effect prior to the taking of bids for any individual state project.

7. The contractor will furnish and file compliance reports within such time and upon such forms as provided by the Michigan Civil Rights Commission, said forms may also elicit information as to the practices, policies, program, and employment statistics of each subcontractor as well as the contractor himself, and said contractor will permit access to his books, records, and accounts by the Michigan Civil Rights Commission and/or its agent, for purposes of investigation to ascertain compliance with this contract and relevant with rules, regulations, and orders of the Michigan Civil Rights Commission.

8. In the event that the Civil Rights Commission finds, after a hearing held pursuant to its rules, that a contractor has not complied with the contractual obligations under this agreement, the Civil Rights Commission may, as part of its order based upon such findings, certify said findings to the Administrative Board of the State of Michigan, which Administrative Board may order the cancellation of the contract found to have been violated and/or declare the contractor ineligible for future contracts with the state and its political and civil subdivisions, departments, and officers and including the governing boards of institutions of higher education, until the contractor complies with said order of the Civil Rights Commission. Notice of said declaration of future ineligibility may be given to any or all of the persons with whom the contractor is declared ineligible to contract as a contracting party in future contracts. In any case before the Civil Rights Commission in which cancellation of an existing contract is a possibility, the contracting agency shall be notified of such possible remedy and shall be given the option by the Civil Rights Commission to participate in such proceedings.

9. The contractor will include, or incorporate by reference, the provisions of the foregoing paragraphs (1) through (8) in every subcontract or purchase order unless exempted by the rules, regulations or orders of the Michigan Civil Rights Commission, and will provide in every subcontract or purchase order that said provisions will be binding upon each subcontractor or seller.

(Rev. 03/92)

APPENDIX B

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulations: The contractor shall comply with the Regulations relative to nondiscrimination in Federally assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 27, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

2. Nondiscrimination: The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or natural origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. Information and Reports: The contractor shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Michigan Department of Transportation or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the Michigan Department of Transportation, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance: In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the Michigan Department of Transportation shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

   (a) Withholding of payments to the contractor under the contract until the contractor complies, and/or

   (b) Cancellation, termination, or suspension of the contract, in whole or in part.

6. Incorporation of Provisions: The contractor shall include the provisions of paragraphs 1 through 6 of every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Michigan Department of Transportation or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for non-compliance; provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Michigan Department of Transportation to enter into such litigation to protect the interests of the State, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

STATE OF MICHIGAN

ADMINISTRATIVE BOARD RESOLUTION

of

May 1, 1979

(As amended on December 2, 1980, April 7, 1981,
August 18, 1981, May 15, 1984, April 7, 1987,
December 15, 1987, January 5, 1988, and May 2, 1989)

DEPARTMENT OF TRANSPORTATION
CONSTRUCTION AND MAINTENANCE CONTRACTS

WHEREAS, pursuant to the provisions of Section 2, Act 17, Public Acts of 1925, as amended, all contracts entered into by the Michigan State Transportation Commission or the Michigan Department of Transportation, hereinafter referred to as the "Commission" and the "Department" respectively, require approval of the State Administrative Board, hereinafter referred to as the "Board," except, the Commission or the Department, without the approval of the Board, is authorized to contract for an amount not exceeding $20,000.00 for each contract, for toilet vault cleaning, use of licensed sanitary landfills, pickup and disposal of refuse, pavement surfacing and patching, rental of equipment for emergency repairs and maintenance operations, curb replacement, maintenance of office equipment, installation of utility services and installation of traffic control devices and without such approval, may authorize Boards of County Road Commissioners, Township Boards, and Municipalities, under contracts for the maintenance of trunkline highways, to subcontract in amounts not to exceed $20,000.00 for each subcontract;

WHEREAS, modification of highway construction and maintenance contracts is sometimes necessary;

WHEREAS, extra work is defined as any work which is determined to be essential to the satisfactory completion of the contract but which neither appears therein as a specific item of work nor is included in the price bid for other items in the contract;

WHEREAS, it is sometimes necessary in order to avoid delays and increased costs for the Department to authorize extra work by modification of the contract without obtaining specific prior approval of the Board for such modification;

THEREFORE, BE IT RESOLVED by the State Administrative Board of the State of Michigan as follows:

1. Pursuant to applicable Public Acts, the Department, without obtaining the approval of this Board, in connection with any construction or maintenance contract, may contract for extra work or labor, or both, not exceeding $48,000.00 per contract for contracts having a value of $800,000.00 or less and not exceeding 6% per contract for contracts having a value over $800,000.00 under a contract with a private agency authorized by law, and for an amount not exceeding $800,000.00 under a contract with Boards of County Road Commissioners, Township Boards, and Municipalities of this State, except that each job for extra or additional work or labor, or both, in excess of $100,000.00 shall require approval of the State Administrative Board.

2. All agreements by the Department to pay for extra work on either a negotiated price or force account basis in excess of the amounts shown in paragraph 1 must be approved by the Board.

3. No extra work which may cause an increase in the contract price in excess of the amount shown in paragraph 1 shall be authorized by the Department prior to Board approval, unless and until the Attorney General has approved the authorization as being in compliance with all legal requirements. Provided, however, that extra work costing not more than $25,000.00 may be authorized by the Department without prior approval of the Attorney General, if necessary to avoid construction delays or increased costs.

4. Department authorizations for extra work, requiring Board approval, given prior to Board approval shall be presented to the Board for subsequent approval or disapproval as quickly as possible, but in no case more than 60 days after the extra work has been authorized by the Department.

5. The Department shall not pay nor agree to pay any disputed claim for extra compensation for extra compensation for work already commenced or completed without approval of the Board.

6. No payments for extra work requiring Board approval shall be made until such Board approval has been obtained.

7. The Department is authorized to balance budgets for extra work recommendations or authorizations previously approved by the Board, by decreasing, in any amount, or increasing, not in excess of 15 percent, the original estimated amount without additional approval by this Board.

8. No payments for increased contract quantities shall be made by the Department unless and until the Board has given prior approval for such payments, except that payments for overruns may be made without Board approval if such payments do not exceed the following percent of the original contract price: 10 percent on contracts of $50,000.00 or more; 15 percent on contracts of $25,000.00 to $49,999.99; and 25 percent on contracts of less than $25,000.00.

9. The department shall deduct from payments, and retain 5 percent of the first $50,000 earned by a contractor and 2 1/2 percent of amounts earned in excess of $50,000 until amounts earned equal 90 percent of the contract price. When the project reaches 90 percent completion, retainage may be reduced to 2 percent of the amount earned. Local units of government, performing as contractors to the department, may be excluded from these retainage provisions.

   In respect to contracts between the Department and Railroad companies, the Department shall retain 5% of amounts earned up to $100,000 and 2% of amounts earned in excess of $100,000. The Department may release the retainage after receipt of the railroad's final billing and prior to audit provided the project has been accepted by the Department and the Department has determined that its ability to promptly recover any overpayment, which may be discovered after audit, is reasonably assured.

10. The Department shall assess damages against any contractor who fails to have the job open to traffic or completed by the dates specified in the contract unless the contractor has been excused for such failure by the Department. The Department may, without approval of the Board, extend the time for opening to traffic or completion of the contract because of delays from unforeseen causes beyond the control and without the fault or negligence of the contractor, including and restricted to: acts of God; acts of the public enemy; acts of Government, acts of the State or any political subdivision thereof; fires; floods; epidemics; strikes; or extraordinary delays in delivery of materials.

    No excusal or waiver of damages, except as above provided, shall be final and binding upon the State unless and until approved by the Board, except excusals and waivers granted by the Department prior to the effective date of this Resolution pursuant to applicable specifications and other contract provisions.

11. The foregoing requirements established by the Board shall be made as express part of all construction and maintenance contracts entered into by the Commission, and the Department's standard and supplemental specifications shall be amended to reflect such requirements.

12. Policy Resolution A, approved by the Board on July 17, 1956, and the Resolutions of October 17, 1967, and May 6, 1975 as amended May 4, 1976, are hereby repealed, except that all rights, causes of action, claims, proceedings and suits existing on the effective date of this Policy Resolution shall continue unaffected.

13. Upon approval by the State Administrative Board, this Resolution shall be effective as of May 2, 1989.

PART II

STANDARD AGREEMENT PROVISIONS

SECTION I COMPLIANCE WITH REGULATIONS AND DIRECTIVES

SECTION II PROJECT ADMINISTRATION AND SUPERVISION

SECTION III ACCOUNTING AND BILLING

SECTION IV MAINTENANCE AND OPERATION

SECTION V SPECIAL PROGRAM AND PROJECT CONDITIONS

SECTION I

COMPLIANCE WITH REGULATIONS AND DIRECTIVES

A. To qualify for eligible cost, all work shall be documented in accordance with the requirements and procedures of the DEPARTMENT.

B. All work on projects for which reimbursement with Federal funds is requested shall be performed in accordance with the requirements and guidelines set forth in the following Directives of the Federal-Aid Policy Guide (FAPG) of the FHWA, as applicable, and as referenced in pertinent sections of Title 23 and Title 49 of the Code of Federal Regulations (CFR), and all supplements and amendments thereto.

1. Engineering

   a. FAPG (6012.1): Preliminary Engineering

   b. FAPG (23 CFR 172): Administration of Engineering and Design Related Service Contracts

   c. FAPG (23 CFR 635A): Contract Procedures

   d. FAPG (49 CFR 18.22): Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments–Allowable Costs

2. Construction

   a. FAPG (23 CFR 140E): Administrative Settlement Costs-Contract Claims

   b. FAPG (23 CFR 140B): Construction Engineering Costs

   c. FAPG (23 CFR 17): Recordkeeping and Retention Requirements for Federal-Aid Highway Records of State Highway Agencies

   d. FAPG (23 CFR 635A): Contract Procedures

   e. FAPG (23 CFR 635B): Force Account Construction

   f. FAPG (23 CFR 645A): Utility Relocations, Adjustments and Reimbursement

g. FAPG (23 CFR 645B): Accommodation of Utilities (PPM 30-4.1)

h. FAPG (23 CFR 655F): Traffic Control Devices on Federal-Aid and other Streets and Highways

i. FAPG (49 CFR 18.22): Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments–Allowable Costs

3. Modification Or Construction Of Railroad Facilities

a. FAPG (23 CFR 140I): Reimbursement for Railroad Work

b. FAPG (23 CFR 646B): Railroad Highway Projects

C. In conformance with FAPG (23 CFR 630C) Project Agreements, the political subdivisions party to this contract, on those Federally funded projects which exceed a total cost of $100,000.00 stipulate the following with respect to their specific jurisdictions:

1. That any facility to be utilized in performance under or to benefit from this contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities issued pursuant to the requirements of the Federal Clean Air Act, as amended, and the Federal Water Pollution Control Act, as amended.

2. That they each agree to comply with all of the requirements of Section 114 of the Federal Clean Air Act and Section 308 of the Federal Water Pollution Control Act, and all regulations and guidelines issued thereunder.

3. That as a condition of Federal aid pursuant to this contract they shall notify the DEPARTMENT of the receipt of any advice indicating that a facility to be utilized in performance under or to benefit from this contract is under consideration to be listed on the EPA List of Violating Facilities.

D. Ensure that the PROJECT is constructed in accordance with and incorporates all committed environmental impact mitigation measures listed in approved environmental documents unless modified or deleted by approval of the FHWA.

E. All the requirements, guidelines, conditions and restrictions noted in all other pertinent Directives and Instructional Memoranda of the FHWA will apply to this contract and will be adhered to, as applicable, by the parties hereto.

SECTION II

PROJECT ADMINISTRATION AND SUPERVISION

A. The DEPARTMENT shall provide such administrative guidance as it determines is required by the PROJECT in order to facilitate the obtaining of available federal and/or state funds.

B. The DEPARTMENT will advertise and award all contracted portions of the PROJECT work. Prior to advertising of the PROJECT for receipt of bids, the REQUESTING PARTY may delete any portion or all of the PROJECT work. After receipt of bids for the PROJECT, the REQUESTING PARTY shall have the right to reject the amount bid for the PROJECT prior to the award of the contract for the PROJECT only if such amount exceeds by ten percent (10%) the final engineer's estimate therefor. If such rejection of the bids is not received in writing within two (2) weeks after letting, the DEPARTMENT will assume concurrence. The DEPARTMENT may, upon request, readvertise the PROJECT. Should the REQUESTING PARTY so request in writing within the aforesaid two (2) week period after letting, the PROJECT will be cancelled and the DEPARTMENT will refund the unused balance of the deposit less all costs incurred by the DEPARTMENT.

C. The DEPARTMENT will perform such inspection services on PROJECT work performed by the REQUESTING PARTY with its own forces as is required to ensure compliance with the approved plans & specifications.

D. On those projects funded with Federal monies, the DEPARTMENT shall as may be required secure from the FHWA approval of plans and specifications, and such cost estimates for FHWA participation in the PROJECT COST.

E. All work in connection with the PROJECT shall be performed in conformance with the Michigan Department of Transportation Standard Specifications for Construction, and the supplemental specifications, Special Provisions and plans pertaining to the PROJECT and all materials furnished and used in the construction of the PROJECT shall conform to the aforesaid specifications. No extra work shall be performed nor changes in plans and specifications made until said work or changes are approved by the project engineer and authorized by the DEPARTMENT.

F. Should it be necessary or desirable that portions of the work covered by this contract be accomplished by a consulting firm, a railway company, or governmental agency, firm, person, or corporation, under a subcontract with the REQUESTING PARTY at PROJECT expense, such subcontracted arrangements will be covered by formal written agreement between the REQUESTING PARTY and that party.

This formal written agreement shall: include a reference to the specific prime contract to which it pertains; include provisions which clearly set forth the maximum reimbursable and the basis of payment; provide for the maintenance of accounting records in accordance with generally accepted accounting principles, which clearly document the actual cost of the services provided; provide that costs eligible for reimbursement shall be in accordance with clearly defined cost criteria such as 49 CFR Part 18, 48 CFR Part 31, 23 CFR Part 140, OMB Circular A-87, etc. as applicable; provide for access to the department or its representatives to inspect and audit all data and records related to the agreement for a minimum of three years after the department's final payment to the local unit.

All such agreements will be submitted for approval by the DEPARTMENT and, if applicable, by the FHWA prior to execution thereof, except for agreements for amounts less than $100,000 for preliminary engineering and testing services executed under and in accordance with the provisions of the "Small Purchase Procedures" FAPG (23 CFR 172), which do not require prior approval of the DEPARTMENT or the FHWA.

Any such approval by the DEPARTMENT shall in no way be construed as a warranty of the subcontractor's qualifications, financial integrity, or ability to perform the work being subcontracted.

G. The REQUESTING PARTY, at no cost to the PROJECT or the DEPARTMENT, shall make such arrangements with railway companies, utilities, etc., as may be necessary for the performance of work required for the PROJECT but for which Federal or other reimbursement will not be requested.

H. The REQUESTING PARTY, at no cost to the PROJECT, or the DEPARTMENT, shall secure, as necessary, all agreements and approvals of the PROJECT with railway companies, the Railroad Safety & Tariffs Division of the DEPARTMENT and other concerned governmental agencies other than the FHWA, and will forward same to the DEPARTMENT for such reviews and approvals as may be required.

I. No PROJECT work for which reimbursement will be requested by the REQUESTING PARTY is to be subcontracted or performed until the DEPARTMENT gives written notification that such work may commence.

J. The REQUESTING PARTY shall be responsible for the payment of all costs and expenses incurred in the performance of the work it agrees to undertake and perform.

K. The REQUESTING PARTY shall pay directly to the party performing the work all billings for the services performed on the PROJECT which are authorized by or through the REQUESTING PARTY.

L. The REQUESTING PARTY shall submit to the DEPARTMENT all paid billings for which reimbursement is desired in accordance with DEPARTMENT procedures.

M. All work by a consulting firm will be performed in compliance with the applicable provisions of 1980 PA 299, Subsection 2001, MCL 339.2001; MSA 18.425(2001), as well as in accordance with the provisions of all previously cited Directives of the FHWA.

N. The project engineer shall be subject to such administrative guidance as may be deemed necessary to ensure compliance with program requirement and, in those instances where a consultant firm is retained to provide engineering and inspection services, the personnel performing those services shall be subject to the same conditions.

O. The DEPARTMENT, in administering the PROJECT in accordance with applicable Federal and State requirements and regulations, neither assumes nor becomes liable for any obligations undertaken or arising between the REQUESTING PARTY and any other party with respect to the PROJECT.

P. In the event it is determined by the DEPARTMENT that there will be either insufficient Federal funds or insufficient time to properly administer such funds for the entire PROJECT or portions thereof, the DEPARTMENT, prior to advertising or issuing authorization for work performance, may cancel the PROJECT, or any portion thereof, and upon written notice to the parties this contract shall be void and of no effect with respect to that cancelled portion of the PROJECT. Any PROJECT deposits previously made by the parties on the cancelled portions of the PROJECT will be promptly refunded.

Q. Those projects funded with Federal monies will be subject to inspection at all times by the DEPARTMENT and the FHWA.

SECTION III

ACCOUNTING AND BILLING

A. Procedures for billing for work undertaken by the REQUESTING PARTY:

1. The REQUESTING PARTY shall establish and maintain accurate records, in accordance with generally accepted accounting principles, of all expenses incurred for which payment is sought or made under this contract, said records to be hereinafter referred to as the "RECORDS". Separate accounts shall be established and maintained for all costs incurred under this contract.

The REQUESTING PARTY shall maintain the RECORDS for at least three (3) years from the date of final payment of Federal Aid made by the DEPARTMENT under this contract. In the event of a dispute with regard to the allowable expenses or any other issue under this contract, the REQUESTING PARTY shall thereafter continue to maintain the RECORDS at least until that dispute has been finally decided and the time for all available challenges or appeals of that decision has expired.

The DEPARTMENT, or its representative, may inspect, copy, or audit the RECORDS at any reasonable time after giving reasonable notice.

If any part of the work is subcontracted, the REQUESTING PARTY shall assure compliance with the above for all subcontracted work.

In the event that an audit performed by or on behalf of the DEPARTMENT indicates an adjustment to the costs reported under this contract, or questions the allowability of an item of expense, the DEPARTMENT shall promptly submit to the REQUESTING PARTY, a Notice of Audit Results and a copy of the audit report which may supplement or modify any tentative findings verbally communicated to the REQUESTING PARTY at the completion of an audit.

Within sixty (60) days after the date of the Notice of Audit Results, the REQUESTING PARTY shall: (a) respond in writing to the responsible Bureau or the DEPARTMENT indicating whether or not it concurs with the audit report, (b) clearly explain the nature and basis for any disagreement as to a disallowed item of expense and, (c) submit to the DEPARTMENT a written explanation as to any questioned or no opinion expressed item of expense, hereinafter referred to as the "RESPONSE". The RESPONSE shall be clearly stated and provide any supporting documentation necessary to resolve any disagreement or questioned or no opinion expressed item of expense. Where the documentation is voluminous, the REQUESTING PARTY may supply appropriate excerpts and make alternate

arrangements to conveniently and reasonably make that documentation available for review by the DEPARTMENT. The RESPONSE shall refer to and apply the language of the contract. The REQUESTING PARTY agrees that failure to submit a RESPONSE within the sixty (60) day period constitutes agreement with any disallowance of an item of expense and authorizes the DEPARTMENT to finally disallow any items of questioned or no opinion expressed cost.

The DEPARTMENT shall make its decision with regard to any Notice of Audit Results and RESPONSE within one hundred twenty (120) days after the date of the Notice of Audit Results. If the DEPARTMENT determines that an overpayment has been made to the REQUESTING PARTY, the REQUESTING PARTY shall repay that amount to the DEPARTMENT or reach agreement with the DEPARTMENT on a repayment schedule within thirty (30) days after the date of an invoice from the DEPARTMENT. If the REQUESTING PARTY fails to repay the overpayment or reach agreement with the DEPARTMENT on a repayment schedule within the thirty (30) day period, the REQUESTING PARTY agrees that the DEPARTMENT shall deduct all or a portion of the overpayment from any funds then or thereafter payable by the DEPARTMENT to the REQUESTING PARTY under this contract or any other agreement, or payable to the REQUESTING PARTY under the terms of 1951 PA 51, as applicable. Interest will be assessed on any partial payments or repayment schedules based on the unpaid balance at the end of each month until the balance is paid in full. The assessment of interest will begin thirty (30) days from the date of the invoice. The rate of interest will be based on the Michigan Department of Treasury common cash funds interest earnings. The rate of interest will be reviewed annually by the DEPARTMENT and adjusted as necessary based on the Michigan Department of Treasury common cash funds interest earnings. The REQUESTING PARTY expressly consents to this withholding or offsetting of funds under those circumstances, reserving the right to file a lawsuit in the Court of Claims to contest the DEPARTMENT'S decision only as to any item of expense the disallowance of which was disputed by the REQUESTING PARTY in a timely filed RESPONSE.

The REQUESTING PARTY shall comply with the Single Audit Act of 1984, as amended, including, but not limited to, the Single Audit Amendments of 1996 (31 USC 7501-7507).

The REQUESTING PARTY shall adhere to the following requirements associated with audits of accounts and records:

a. Agencies expending a total of $500,000 or more in federal funds, from one or more funding sources in its fiscal year, shall comply with the requirements of the federal Office of Management and Budget (OMB) Circular A-133, as revised or amended.

The agency shall submit two copies of:

The Reporting Package
The Data Collection Form
The management letter to the agency, if one issued by the audit firm

The OMB Circular A-133 audit must be submitted to the address below in accordance with the time frame established in the circular, as revised or amended.

b. Agencies expending less than $500,000 in federal funds must submit a letter to the Department advising that a circular audit was not required. The letter shall indicate the applicable fiscal year, the amount of federal funds spent, the name(s) of the Department federal programs, and the CFDA grant number(s). This information must also be submitted to the address below.

c. Address: Michigan Department of Education
Accounting Service Center
Hannah Building
608 Allegan Street
Lansing, MI 48909

d. Agencies must also comply with applicable State laws and regulations relative to audit requirements.

e. Agencies shall not charge audit costs to Department's federal programs which are not in accordance with the OMB Circular A-133 requirements.

f. All agencies are subject to the federally required monitoring activities, which may include limited scope reviews and other on-site monitoring.

2. Agreed Unit Prices Work - All billings for work undertaken by the REQUESTING PARTY on an agreed unit price basis will be submitted in accordance with the Michigan Department of Transportation Standard Specifications for Construction and pertinent FAPG Directives and Guidelines of the FHWA.

3. Force Account Work and Subcontracted Work - All billings submitted to the DEPARTMENT for Federal reimbursement for items of work performed on a force account basis or by any subcontract with a consulting firm, railway company, governmental agency or other party, under the terms of this contract, shall be prepared in accordance with the provisions of the pertinent FHPM Directives and the procedures of the DEPARTMENT. Progress billings may be submitted monthly during the time work is being performed provided, however, that no bill of a lesser amount than $1,000.00 shall be submitted unless it is a final

or end of fiscal year billing. All billings shall be labeled either "Progress Bill Number _____", or "Final Billing".

4. Final billing under this contract shall be submitted in a timely manner but not later than six months after completion of the work. Billings for work submitted later than six months after completion of the work will not be paid.

5. Upon receipt of billings for reimbursement for work undertaken by the REQUESTING PARTY on projects funded with Federal monies, the DEPARTMENT will act as billing agent for the REQUESTING PARTY, consolidating said billings with those for its own force account work and presenting these consolidated billings to the FHWA for payment. Upon receipt of reimbursement from the FHWA, the DEPARTMENT will promptly forward to the REQUESTING PARTY its share of said reimbursement.

6. Upon receipt of billings for reimbursement for work undertaken by the REQUESTING PARTY on projects funded with non-Federal monies, the DEPARTMENT will promptly forward to the REQUESTING PARTY reimbursement of eligible costs.

B. Payment of Contracted and DEPARTMENT Costs:

1. As work on the PROJECT commences, the initial payments for contracted work and/or costs incurred by the DEPARTMENT will be made from the working capital deposit. Receipt of progress payments of Federal funds, and where applicable, State Critical Bridge funds, will be used to replenish the working capital deposit. The REQUESTING PARTY shall make prompt payments of its share of the contracted and/or DEPARTMENT incurred portion of the PROJECT COST upon receipt of progress billings from the DEPARTMENT. Progress billings will be based upon the REQUESTING PARTY'S share of the actual costs incurred as work on the PROJECT progresses and will be submitted, as required, until it is determined by the DEPARTMENT that there is sufficient available working capital to meet the remaining anticipated PROJECT COSTS. All progress payments will be made within thirty (30) days of receipt of billings. No monthly billing of a lesser amount than $1,000.00 will be made unless it is a final or end of fiscal year billing. Should the DEPARTMENT determine that the available working capital exceeds the remaining anticipated PROJECT COSTS, the DEPARTMENT may reimburse the REQUESTING PARTY such excess. Upon completion of the PROJECT, payment of all PROJECT COSTS, receipt of all applicable monies from the FHWA, and completion of necessary audits, the REQUESTING PARTY will be reimbursed the balance of its deposit.

2. In the event that the bid, plus contingencies, for the contracted, and/or the DEPARTMENT incurred portion of the PROJECT work exceeds the estimated cost therefor as established by this contract, the REQUESTING PARTY may be advised and billed for the additional amount of its share.

C. General Conditions:

1. The DEPARTMENT, in accordance with its procedures in existence and covering the time period involved, shall make payment for interest earned on the balance of working capital deposits for all projects on account with the DEPARTMENT. The REQUESTING PARTY in accordance with DEPARTMENT procedures in existence and covering the time period involved, shall make payment for interest owed on any deficit balance of working capital deposits for all projects on account with the DEPARTMENT. This payment or billing is processed on an annual basis corresponding to the State of Michigan fiscal year. Upon receipt of billing for interest incurred, the REQUESTING PARTY promises and shall promptly pay the DEPARTMENT said amount.

2. Pursuant to the authority granted by law, the REQUESTING PARTY hereby irrevocably pledges a sufficient amount of funds received by it from the Michigan Transportation Fund to meet its obligations as specified in PART I and PART II. If the REQUESTING PARTY shall fail to make any of its required payments when due, as specified herein, the DEPARTMENT shall immediately notify the REQUESTING PARTY and the State Treasurer of the State of Michigan or such other state officer or agency having charge and control over disbursement of the Michigan Transportation Fund, pursuant to law, of the fact of such default and the amount thereof, and, if such default is not cured by payment within ten (10) days, said State Treasurer or other state officer or agency is then authorized and directed to withhold from the first of such monies thereafter allocated by law to the REQUESTING PARTY from the Michigan Transportation Fund sufficient monies to remove the default, and to credit the REQUESTING PARTY with payment thereof, and to notify the REQUESTING PARTY in writing of such fact.

3. Upon completion of all work under this contract and final audit by the DEPARTMENT or the FHWA, the REQUESTING PARTY promises to promptly repay the DEPARTMENT for any disallowed items of costs previously disbursed by the DEPARTMENT. The REQUESTING PARTY pledges its future receipts from the Michigan Transportation Fund for repayment of all disallowed items and, upon failure to make repayment for any disallowed items within ninety (90) days of demand made by the DEPARTMENT, the DEPARTMENT is hereby authorized to withhold an equal amount from the REQUESTING PARTY'S share of any future distribution of Michigan Transportation Funds in settlement of said claim.

4. The DEPARTMENT shall maintain and keep accurate records and accounts relative to the cost of the PROJECT and upon completion of the PROJECT, payment of all items of PROJECT COST, receipt of all Federal Aid, if any, and completion of final audit by the DEPARTMENT and if applicable, by the FHWA, shall make final accounting to the REQUESTING PARTY. The final PROJECT accounting will not include interest earned or charged on working capital deposited for the PROJECT which will be accounted for separately at the close of the State of Michigan fiscal year and as set forth in Section C(1).

5. The costs of engineering and other services performed on those projects involving specific program funds and one hundred percent (100%) local funds will be apportioned to the respective portions of that project in the same ratio as the actual direct construction costs unless otherwise specified in PART I.

SECTION IV

MAINTENANCE AND OPERATION

A. Upon completion of construction of each part of the PROJECT, at no cost to the DEPARTMENT or the PROJECT, each of the parties hereto, within their respective jurisdictions, will make the following provisions for the maintenance and operation of the completed PROJECT:

1. All Projects:

   Properly maintain and operate each part of the project, making ample provisions each year for the performance of such maintenance work as may be required, except as qualified in paragraph 2b of this section.

2. Projects Financed in Part with Federal Monies:

   a. Sign and mark each part of the PROJECT, in accordance with the current Michigan Manual of Uniform Traffic control Devices, and will not install, or permit to be installed, any signs, signals or markings not in conformance with the standards approved by the FHWA, pursuant to 23 USC 109(d).

   b. Remove, prior to completion of the PROJECT, all encroachments from the roadway right-of-way within the limits of each part of the PROJECT.

      With respect to new or existing utility installations within the right-of-way of Federal Aid projects and pursuant to FAPG (23 CFR 645B): Occupancy of non-limited access right-of-way may be allowed based on consideration for traffic safety and necessary preservation of roadside space and aesthetic quality. Longitudinal occupancy of non-limited access right-of-way by private lines will require a finding of significant economic hardship, the unavailability of practicable alternatives or other extenuating circumstances.

   c. Cause to be enacted, maintained and enforced, ordinances and regulations for proper traffic operations in accordance with the plans of the PROJECT.

   d. Make no changes to ordinances or regulations enacted, or traffic controls installed in conjunction with the PROJECT work without prior review by the DEPARTMENT and approval of the FHWA, if required.

B. On projects for the removal of roadside obstacles, the parties, upon completion of construction of each part of the PROJECT, at no cost to the PROJECT or the DEPARTMENT, will, within their respective jurisdictions, take such action as is necessary to assure that the roadway right-of-way, cleared as the PROJECT, will be maintained free of such obstacles.

C. On projects for the construction of bikeways, the parties will enact no ordinances or regulations prohibiting the use of bicycles on the facility hereinbefore described as the PROJECT, and will amend any existing restrictive ordinances in this regard so as to allow use of this facility by bicycles. No motorized vehicles shall be permitted on such bikeways or walkways constructed as the PROJECT except those for maintenance purposes.

D. Failure of the parties hereto to fulfill their respective responsibilities as outlined herein may disqualify that party from future Federal-aid participation in projects on roads or streets for which it has maintenance responsibility. Federal Aid may be withheld until such time as deficiencies in regulations have been corrected, and the improvements constructed as the PROJECT are brought to a satisfactory condition of maintenance.

SECTION V

SPECIAL PROGRAM AND PROJECT CONDITIONS

A. Those projects for which the REQUESTING PARTY has been reimbursed with Federal monies for the acquisition of right-of-way must be under construction by the close of the twentieth (20th) fiscal year following the fiscal year in which the FHWA and the DEPARTMENT projects agreement covering that work is executed, or the REQUESTING PARTY may be required to repay to the DEPARTMENT, for forwarding to the FHWA, all monies distributed as the FHWA'S contribution to that right-of-way.

B. Those projects for which the REQUESTING PARTY has been reimbursed with Federal monies for the performance of preliminary engineering must be under construction by the close of the tenth (10th) fiscal year following the fiscal year in which the FHWA and the DEPARTMENT projects agreement covering that work is executed, or the REQUESTING PARTY may be required to repay to the DEPARTMENT, for forwarding to the FHWA, all monies distributed as the FHWA'S contribution to that preliminary engineering.

C. On those projects funded with Federal monies, the REQUESTING PARTY, at no cost to the PROJECT or the DEPARTMENT, will provide such accident information as is available and such other information as may be required under the program in order to make the proper assessment of the safety benefits derived from the work performed as the PROJECT. The REQUESTING PARTY will cooperate with the DEPARTMENT in the development of reports and such analysis as may be required and will, when requested by the DEPARTMENT, forward to the DEPARTMENT, in such form as is necessary, the required information.

D. In connection with the performance of PROJECT work under this contract the parties hereto (hereinafter in Appendix "A" referred to as the "contractor") agree to comply with the State of Michigan provisions for "Prohibition of Discrimination in State Contracts", as set forth in Appendix A, attached hereto and made a part hereof. The parties further covenant that they will comply with the Civil Rights Acts of 1964, being P.L. 88-352, 78 Stat. 241, as amended, being Title 42 U.S.C. Sections 1971, 1975a-1975d, and 2000a-2000h-6 and the Regulations of the United States Department of Transportation (49 C.F.R. Part 21) issued pursuant to said Act, including Appendix "B", attached hereto and made a part hereof, and will require similar covenants on the part of any contractor or subcontractor employed in the performance of this contract.

E. The parties will carry out the applicable requirements of the DEPARTMENT'S Disadvantaged Business Enterprise (DBE) program and 49 CFR, Part 26, including, but not limited to, those requirements set forth in Appendix C.

APPENDIX A
PROHIBITION OF DISCRIMINATION IN STATE CONTRACTS

In connection with the performance of work under this contract; the contractor agrees as follows:

1. In accordance with Public Act 453 of 1976 (Elliott-Larsen Civil Rights Act), the contractor shall not discriminate against an employee or applicant for employment with respect to hire, tenure, treatment, terms, conditions, or privileges of employment or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, or marital status. A breach of this covenant will be regarded as a material breach of this contract. Further, in accordance with Public Act 220 of 1976 (Persons with Disabilities Civil Rights Act), as amended by Public Act 478 of 1980, the contractor shall not discriminate against any employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment or a matter directly or indirectly related to employment because of a disability that is unrelated to the individual's ability to perform the duties of a particular job or position. A breach of the above covenants will be regarded as a material breach of this contract.

2. The contractor hereby agrees that any and all subcontracts to this contract, whereby a portion of the work set forth in this contract is to be performed, shall contain a covenant the same as hereinabove set forth in Section 1 of this Appendix.

3. The contractor will take affirmative action to ensure that applicants for employment and employees are treated without regard to their race, color, religion, national origin, age, sex, height, weight, marital status, or any disability that is unrelated to the individual's ability to perform the duties of a particular job or position. Such action shall include, but not be limited to, the following: employment; treatment; upgrading; demotion or transfer; recruitment; advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

4. The contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, age, sex, height, weight, marital status, or disability that is unrelated to the individual's ability to perform the duties of a particular job or position.

5. The contractor or its collective bargaining representative shall send to each labor union or representative of workers with which the contractor has a collective bargaining agreement or other contract or understanding a notice advising such labor union or workers' representative of the contractor's commitments under this Appendix.

6. The contractor shall comply with all relevant published rules, regulations, directives, and orders of the Michigan Civil Rights Commission that may be in effect prior to the taking of bids for any individual state project.

7. The contractor shall furnish and file compliance reports within such time and upon such forms as provided by the Michigan Civil Rights Commission; said forms may also elicit information as to the practices, policies, program, and employment statistics of each subcontractor, as well as the contractor itself, and said contractor shall permit access to the contractor's books, records, and accounts by the Michigan Civil Rights Commission and/or its agent for the purposes of investigation to ascertain compliance under this contract and relevant rules, regulations, and orders of the Michigan Civil Rights Commission.

8. In the event that the Michigan Civil Rights Commission finds, after a hearing held pursuant to its rules, that a contractor has not complied with the contractual obligations under this contract, the Michigan Civil Rights Commission may, as a part of its order based upon such findings, certify said findings to the State Administrative Board of the State of Michigan, which State Administrative Board may order the cancellation of the contract found to have been violated and/or declare the contractor ineligible for future contracts with the state and its political and civil subdivisions, departments, and officers, including the governing boards of institutions of higher education, until the contractor complies with said order of the Michigan Civil Rights Commission. Notice of said declaration of future ineligibility may be given to any or all of the persons with whom the contractor is declared ineligible to contract as a contracting party in future contracts. In any case before the Michigan Civil Rights Commission in which cancellation of an existing contract is a possibility, the contracting agency shall be notified of such possible remedy and shall be given the option by the Michigan Civil Rights Commission to participate in such proceedings.

9. The contractor shall include or incorporate by reference, the provisions of the foregoing paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Michigan Civil Rights Commission; all subcontracts and purchase orders will also state that said provisions will be binding upon each subcontractor or supplier.

APPENDIX B
TITLE VI ASSURANCE

During the performance of this contract, the contractor, for itself, its assignees, and its successors in interest (hereinafter referred to as the "contractor"), agrees as follows:

1. **Compliance with Regulations**: For all federally assisted programs, the contractor shall comply with the nondiscrimination regulations set forth in 49 CFR Part 21, as may be amended from time to time (hereinafter referred to as the Regulations). Such Regulations are incorporated herein by reference and made a part of this contract.

2. **Nondiscrimination**: The contractor, with regard to the work performed under the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection, retention, and treatment of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices, when the contractor covers a program set forth in Appendix B of the Regulations.

3. **Solicitation for Subcontracts, Including Procurements of Materials and Equipment**: All solicitations made by the contractor, either by competitive bidding or by negotiation for subcontract work, including procurement of materials or leases of equipment, must include a notification to each potential subcontractor or supplier of the contractor's obligations under the contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. **Information and Reports**: The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and facilities as may be determined to be pertinent by the Department or the United States Department of Transportation (USDOT) in order to ascertain compliance with such Regulations or directives. If required information concerning the contractor is in the exclusive possession of another who fails or refuses to furnish the required information, the contractor shall certify to the Department or the USDOT, as appropriate, and shall set forth the efforts that it made to obtain the information.

5. **Sanctions for Noncompliance**: In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the Department shall impose such contract sanctions as it or the USDOT may determine to be appropriate, including, but not limited to, the following:

    a. Withholding payments to the contractor until the contractor complies; and/or

    b. Canceling, terminating, or suspending the contract, in whole or in part.

6. **Incorporation of Provisions**: The contractor shall include the provisions of Sections (1) through (6) in every subcontract, including procurement of material and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Department or the USDOT may direct as a means of enforcing such provisions, including sanctions for non-compliance, provided, however, that in the event a contractor becomes involved in or is threatened with litigation from a subcontractor or supplier as a result of such direction, the contractor may request the Department to enter into such litigation to protect the interests of the state. In addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

Revised June 2011

APPENDIX C

TO BE INCLUDED IN ALL FINANCIAL ASSISTANCE AGREEMENTS WITH LOCAL AGENCIES

Assurance that Recipients and Contractors Must Make (Excerpts from US DOT Regulation 49 CFR 26.13)

A. Each financial assistance agreement signed with a DOT operating administration (or a primary recipient) must include the following assurance:

> The recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any US DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of US DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR Part 26 and as approved by US DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 et seq.).

B. Each contract MDOT signs with a contractor (and each subcontract the prime contractor signs with a subcontractor) must include the following assurance:

> The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of US DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

Agenda Item: NB-4
Date: 08-05-2021

City Council Agenda Item Request

Date: 07/30/21

Name: Kim Peterson

Department: Recreation

Item: Award of a Bid to Payne & Dolan, Inc.

Meeting date requested: 08/05/21

Explanation for request:

The State of Michigan let bids out for the North City Limits Non-Motorized Pathway. Two bids were received. Administration is recommending the low bid from Payne & Dolan, Inc. in the amount of $867,092.05.

Agenda Item: _____

Date: _____

City Council Agenda Item Request

Date: 07/30/21

Name: Kim Peterson

Department: Recreation

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For Internal Use Only

Please complete this form for EACH agenda item requested. You only need to check yes or no.
The Clerk's office will handle the date and number information.

1. Is there back-up documentation required? ☑ Yes ☐ No
   *If yes, attach documents with completed request form.

2. Is the back-up documentation clear of any personal information? ☑ Yes ☐ No

   *Reviewed by Clerk's office: _____

3. Is a Public Hearing required? ☐ Yes ☑ No

   Date sent to Daily Press: _____ Date ran in Daily Press: _____

4. Is Public Notice Required? ☐ Yes ☑ No

   Date sent to Daily Press: _____ Date ran in Daily Press: _____

5. Is a Resolution needed? ☐ Yes ☑ No

   Resolution Number: _____

6. Is an Ordinance needed? ☐ Yes ☑ No

   Ordinance Number: _____

7. Is an agreement or contract needed? ☑ Yes ☐ No

   Contract Signed by: _____ Date: _____

Letting of June 04, 2021

Letting Call: 2106 020

Low Bid: $867,092.05

Project: TAUL 21000-207911

Engineer Estimate: $955,894.05

Local Agreement: 21-5211

Pct Over/Under Estimate: -9.29 %

Start Date: 10 days after award

Completion Date: October 1, 2021

Description:

1.69 mi of hot mix asphalt shared-use path, and concrete curb, gutter and ramps along Danforth Road from North 30th Street to Lincoln Road (US-2/US-41/M-35) in the city of Escanaba, Delta County. This is a Local Agency project.

3.00 % DBE participation required

Bidder	As-Submittted
Payne & Dolan Inc.	$867,092.05
Oberstar Inc.	$961,260.55

Total Number of Bidders: 2

Agenda Item: NB-5
Date: 08-05-2021

City Council Agenda Item Request

Date: 7/27/2021

Name: Jeff Lampi

Department: Water Department

Item: 2021 Silverado Regular Cab Pickup, 4WD

Meeting date requested: 8/5/21

Explanation for request:

Please considerer this as a request for City Councils authorization to purchase a 2021 Silverado Regular Cab Pickup 4WD from Riverside Chevrolet Buick GMC of Escanaba, Michigan at a cost not to exceed $30,000, including $449.00 for running board steps, $695.00 for bed liner, and $1,500.00 for signage, amber lighting, and city 2-way radio.

Money has not been budgeted, but is available for this purchase within the current budget.

GM Vehicle Locator

Dealer Information

RIVERSIDE CHEVROLET BUICK GMC
5273 HWY US 2 & 41
ESCANABA, MI 49829
Phone: 906-786-5020
Fax: 906-786-2459

3GCNYAEK4MG374353

Model Year: 2021
Make: Chevrolet
Model: 1500 Silverado
CK10903-LWB, 4WD, Reg Cab Pickup
PEG: 1WT-Work Truck Preferred Equipment Group
Primary Color: GAN-Silver Ice Metallic
Trim: H2G-1WT-Vinyl, Jet Black, Interior Trim
Engine: L3B-Engine: 2.7L, Turbo
Transmission: MQE-8-Speed Automatic

Event Code: 5000-Delivered to Dealer
Order #: ZPNFMW
MSRP: $35,750.00

Order Type: TRE-Retail Stock
Stock #: 14993
Inventory Status: Available
Total Cash Allowance: N/A

Total Cash Allowance: N/A

Additional Vehicle Information	
GM Marketing Information	

Vehicle Options

Chargeable Options	MSRP
1SZ-WT VALUE PACKAGE DISCOUNT & 2.7 L TURBO ENGINE CREDIT	-$2,500.00
C4P-Air Conditioning - Single Zone Manual, Semi-automatic	$100.00
KI4-120 Volt Electrical Receptacle, In Cab	$225.00
PEB-1WT Value Package	$2,055.00
U2K-SiriusXM Satellite Radio (subscription)	$100.00
UE1-OnStar Communication System	$175.00

No Cost Options

C5H-GVW Rating 6900 Lbs
FE9-Federal Emissions
GU6-Rear Axle: 3.42 Ratio
KW5-Alternator, 220 AMP
L3B-Engine: 2.7L, Turbo
MQE-8-Speed Automatic
RD6-Wheels: 17" Steel - Painted Ultra Silver

Other Options

1WT-Work Truck Preferred Equipment Group
AKO-Glass, Deep Tinted
AU3-Power Door Locks
C49-Defogger, Rear Window, Electric
E63-Durabed
H2G-1WT-Vinyl, Jet Black, Interior Trim
K34-Cruise Control
QBN-Tires: 255/70 R17 All Season, Blackwall
QK1-Standard Tailgate
SAF-Spare Tire Lock
V76-Recovery Hooks
Z82-Trailering Package
AE7-Seats: Front 40/20/40 Split-Bench, Uplevel
AQQ-Keyless Remote Entry
BG9-Floor Covering: Rubberized Vinyl, Black
DLF-Mirrors, O/S: Power, Heated
GAN-Silver Ice Metallic
IOR-Chevrolet Infotainment, 8" Color Screen
PCV-1WT Convenience 1 Package
QBR-Tire, Spare: 255/70 R17 All Season, Blackwall
QT5-Tailgate Function--EZ Lift, Power Lock & Release
UVC-Rear Vision Camera
VK3-Front License Plate Mounting Provisions

"~" indicates vehicle belongs to Trading Partner's inventory

Disclaimer:

GM has tried to make the pricing information provided in this summary accurate. Please refer to actual vehicle invoice, however, for complete pricing information. GM will not make any sales or policy adjustments in the case of inaccurate pricing information in this summary.

CITY OF ESCANABA

$	35750	MSRP
−	8795	DISCOUNT
$	26,955	PLUS TAX, TITLE + LICENSE IF APPLICABLE

◀ PULL THIS STRIP TO EXPOSE ADHESIVE

CHEVROLET

2021 SILVERADO REG WT 4WD

EXTERIOR: SILVER ICE METALLIC
INTERIOR: JET BLACK

ENGINE: 2.7L TURBO
TRANSMISSION: 8-SPEED AUTO

Visit us at www.chevy.com

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN

OWNER BENEFITS
- 3 YEAR / 36,000 MILE* BUMPER-TO-BUMPER LIMITED WARRANTY
- 5 YEAR / 60,000 MILE* POWERTRAIN LIMITED WARRANTY, ROADSIDE ASSISTANCE & COURTESY TRANSPORTATION
- FIRST MAINTENANCE VISIT
- WHICHEVER COMES FIRST
- *SEE CHEVROLET.COM OR DEALER FOR TERMS, DETAILS & LIMITS

SAFETY & SECURITY
- REAR VISION CAMERA
- TEEN DRIVER MODE
- TIRE PRESSURE MONITORING WITH TIRE FILL ALERT

PERFORMANCE & MECHANICAL
- AUTOTRAC TRANSFER CASE
- STABILITRAK W/ TRAILER SWAY CONTROL & HILL START ASSIST
- ALL-SEASON TIRES
- BRAKE PAD WEAR INDICATOR

CONNECTIVITY & TECHNOLOGY
- CHEVROLET INFOTAINMENT 3 7" DIAG COLOR TOUCHSCREEN ADDITIONAL FEATURES FOR COMPATIBLE PHONES INCLUDE: BLUETOOTH AUDIO STREAMING VOICE COMMAND PASSTHROUGH TO PHONE, WIRED ANDROID AUTO & WIRED APPLE CARPLAY CAPABLE
- USB PORTS
- DRIVER INFORMATION CENTER

INTERIOR
- FRONT 40/20/40 BENCH SEATS W/ COVERED ARMREST STORAGE

EXTERIOR
- CORNERSTEP REAR BUMPER
- CARGO BED RAIL PROTECTORS
- 12 TIE DOWNS IN CARGO BED
- HALOGEN REFLECTOR HEADLAMPS
- FRONT RECOVERY HOOKS

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	**$33,900.00**

OPTIONS & PRICING

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

WT VALUE PACKAGE	2,055.00
• REMOTE KEYLESS ENTRY	
• EZ LIFT, POWER LOCK & RELEASE TAILGATE	
• DEEP-TINTED GLASS	
• REAR-WINDOW DEFOGGER	
• CRUISE CONTROL	
• POWER ADJUSTABLE HEATED MIRRORS	
• POWER WINDOWS	
• POWER DOOR LOCKS	
• TRAILERING PACKAGE	
- TRAILER HITCH	
- 7 PIN AND 4 PIN CONNECTORS	
- HITCH GUIDANCE	
120V INSTRUMENT PANEL & CARGO BED POWER OUTLETS	225.00
ONSTAR (R) SERVICES & 4G LTE WI-FI (R) AVAILABLE; SEE ONSTAR.COM FOR TERMS	175.00
SINGLE-ZONE SEMI -AUTOMATIC AIR CONDITIONING	100.00
SIRIUSXM RADIO CAPABLE, ALL ACCESS TRIAL W/ SUBSCRIPTION SOLD SEPARATELY	100.00
GVWR: 6,900 LBS. (3,130 KG)	INC.
REAR AXLE: 3.42 RATIO	INC.
ALTERNATOR; 220 AMPS	INC.
17" PAINTED STEEL WHEELS	INC.
TOTAL OPTIONS	$2,655.00
TOTAL VEHICLE & OPTIONS	$36,555.00
DESTINATION CHARGE	1,695.00
TOTAL BEFORE SAVINGS	$38,250.00
WT VALUE PACKAGE DISCOUNT &	-2,500.00
2.7 L TURBO ENGINE CREDIT	
TOTAL VEHICLE PRICE*	**$35,750.00**

EPA DOT Fuel Economy and Environment

Gasoline Vehicle

Fuel Economy

20 MPG combined city/hwy — 19 city — 22 highway

5.0 gallons per 100 miles

Standard pickup trucks range from 12 to 27 MPG. The best vehicle rates 141 MPGe.

You **spend $2,500** more in fuel costs over 5 years compared to the average new vehicle.

GKX

Annual fuel cost $2,000

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 4 (1 — 10 Best)

Smog Rating (tailpipe only): 6 (1 — 10 Best)

This vehicle emits 443 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $2.70 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code*

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score ★★★★
Based on the combined ratings of frontal, side and rollover.
Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver	★★★★★
	Passenger	★★★★

Based on the risk of injury in a frontal impact.
Should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat	★★★★★
	Rear seat	Not Rated

Based on the risk of injury in a side impact.

Rollover ★★★★
Based on the risk of rollover in a single-vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

Equipped with the safety and security of OnStar.
Visit onstar.com for details.
onstar.com/privacy

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 46%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 38%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
SILAO, GJ MEXICO
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law – Do not remove prior to delivery to the ultimate purchaser. "Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above, local taxes or license fees.

ORDER NO ZPNFMW SALES CODE E
SALES MODEL CODE CK10903
DEALER NO 19148
FINAL ASSEMBLY:
SILAO, GJ MEXICO
VIN 3GCNYAEK4MG374353 REISSUE

DEALER TO WHOM DELIVERED
RIVERSIDE CHEVROLET BUICK GMC
5273 HWY US 2 & 41
ESCANABA, MI 49829-9574

Agenda Item: NB-6
Date: 08-05-2021

City Council Agenda Item Request

Date: 7/29/2021

Name: Jeff Lampi

Department: Water Department

Item: 2021 Ram 5500 Reg. Cab DRW 4x4 with dump box

Meeting date requested: 8/5/2021

Explanation for request:

Please considerer this as a request for City Council's authorization to purchase a 2021 Ram 5500 regular cab DRW 4x4 with dump box from LaFontaine CDJR-Lansing from Lansing, Michigan, at a cost not to exceed $62,000 delivered and $1,500.00 for signage, lighting, and 2-way radio.

Money is available and alloted for this purchase within the current budget.

LaFontaine CDJR-Lansing
6131 S. Pennsylvania Ave.
Lansing, MI 48911
517-394-1022-Direct
517-394-1205-Fax
mdeacon@lafontaine.com

QUOTATION

Name: City of Escanaba
Address:
City: State: Zip:
Contact: Jeff Lampi
Phone: 906.786.3291
Email: jlampi@escanaba.org

Date: 7/19/2021
Quote: 071921

State of Michigan	
2021 Ram 5500 Crew Cab Chassis 4x4	$33,164.00
2YA 6.7l i6 Cummings Turbo Diesel Engine	$8,909.00
V9 Black Cloth Bench Seat 40/20/4	$295.00
TY5 225/70R All Traction Tires	$250.00
MRT Chrome Side Steps	$495.00
LBN Power Take Off Prep	$295.00
A61 Tradesman Level 1 Equipment Group	$995.00
AMP Chrome Appearance Group	$801.00
AHQ Max Tow Package	$695.00
AHD Heavy Duty Snow Plow Prep Group	$317.00
XNR Manual DPF Regeneration	$245.00
ADH Electrical Accessory Group	$545.00
XAC Parkview Rear Back up Camera	$495.00
ADE Cold Weather Group	$175.00
UAA Uconnect 3 w/ 5" Display	$640.00
Knapheide 9' Dump Body (see attachment)	$11,054.00
Note per contract delivery is available @ $2.00 per one way mileage.	
Total Cost:	$59,370.00

Signed: *Michelle Deacon*

KNAPHEIDE TRUCK EQUIPMENT CENTER

KNAPHEIDE TRUCK EQUIPMENT
1200 S. AVERILL AVE
FLINT MI 48503
810-744-0295
FAX #: 855-629-4643

I N V O I C E
==========

P.O.
INVOICE:
ORDER: F94265
DATE:

Customer: 7085
LAFONTAINE DJR OF LANSING
6131 S. PENNSYLVANIA AVE.

LANSING MI 48911
517-394-1200
Contact: MARK VANLOO

End User ID:
LAFONTAINE DODGE-LANSING
6131 SOUTH PENNSYLVANIA AVE

LANSING MI
SALES REP: 22
Ship Via:INSTALLER

MAKE:RAM	MODEL:5500	YEAR: 2021	VIN:3C7WRNAL2MG526205
Start:12/21/20	Reqd:03/26/21	FO:47193772	TPC\LPC\FPC: TPC227896

KDBF916-B MARK VANLOO

KNAPHEIDE 9' GENERAL CONTRACTOR DUMP BODY ,
16 INCH FIXED SIDES, 3.22 YARD CAPACITY
" 7GA HRCQ floor plate (hot rolled cold quenched)
- Two piece, full seam welded
" 10GA HY50 bulkhead
" 12GA HY50 double panel sides
" Double panel tailgate construction
- 12GA HY50 outer panel
- 10 GA HY50 inner panel
" 10 GA HY50 End rails, Bulkhead & Corner posts
" Boxed section top rail for strength and appearance.
" 100% Fully Seam Welded Construction
" E Coated in Knapheide's 12 stage Electrodeposition prime paint system
" Six inch tall Side /Cheater Board pockets
" Designed to accept 2X6 lumber
" CNC punched window for rear visibility
" Quick, easy, one handed tailgate operation
" Offset handle for coal chute option
" Industry standard tailgate release
" Locks tailgate in place for transport
" Full sized handle for ease of operation
" Delayed release rope attachment provision
" Chain loop for transport security
" Toe saver safety catch is designed to keep the tailgate from dropping on your foot when upper and lower tailgate latches are released

*** CONTINUED NEXT PAGE ***

KNAPHEIDE TRUCK EQUIPMENT CENTER

KNAPHEIDE TRUCK EQUIPMENT
1200 S. AVERILL AVE
FLINT MI 48503
810-744-0295
FAX #: 855-629-4643

I N V O I C E
==========

P.O.
INVOICE:
ORDER: F94265
DATE:

Customer: 7085
LAFONTAINE DJR OF LANSING
6131 S. PENNSYLVANIA AVE.

LANSING MI 48911
517-394-1200
Contact: MARK VANLOO

End User ID:
LAFONTAINE DODGE-LANSING
6131 SOUTH PENNSYLVANIA AVE

LANSING MI
SALES REP: 22
Ship Via:INSTALLER

MAKE:RAM	MODEL:5500	YEAR: 2021	VIN:3C7WRNAL2MG526205
Start:12/21/20	Reqd:03/26/21	FO:47193772	TPC\LPC\FPC: TPC227896

KDBF916-B MARK VANLOO
" Safety catch built into the lower tailgate pivot point
" Boxed rear corner posts
" Roll tarp retainers
" Spreader chain banjos - top and bottom
" LED marker lights
" Grease fittings on anything that moves
" Western style understructure (a.k.a. crossmemberless)
" No crossmembers to rust out
" Floor wash boarding is eliminated
" Smooth underbody reduces corrosion
" Trapezoidal boxed longsills support the dump body floor
" Long sills are fully coated inside and out with a water based undercoating

DUMP BODY STRAIGHT 1/4 CAB PROTECTOR, FORD/GM/RAM, BLACK

CHAMPION 11' SUBFRAME HOIST
D/A ELECTRIC KNAP SUBFRAME

BUSS 250A MEGA FUSE

BUSS FUSE HOLDER FOR AMG FUSES

*** CONTINUED NEXT PAGE ***

KNAPHEIDE TRUCK EQUIPMENT CENTER

KNAPHEIDE TRUCK EQUIPMENT
1200 S. AVERILL AVE
FLINT MI 48503
810-744-0295
FAX #: 855-629-4643

I N V O I C E
==========

P.O.
INVOICE:
ORDER: F94265
DATE:

Customer: 7085
LAFONTAINE DJR OF LANSING
6131 S. PENNSYLVANIA AVE.

LANSING MI 48911
517-394-1200
Contact: MARK VANLOO

End User ID:
LAFONTAINE DODGE-LANSING
6131 SOUTH PENNSYLVANIA AVE

LANSING MI
SALES REP: 22
Ship Via:INSTALLER

MAKE:RAM	MODEL:5500	YEAR: 2021	VIN:3C7WRNAL2MG526205
Start:12/21/20	Reqd:03/26/21	FO:47193772	TPC\LPC\FPC: TPC227896

KDBF916-B MARK VANLOO
12V ELECTRIC/HYDRAULIC SUBFRAME HOIST
DOUBLE-ACTING (POWER-UP/POWER-DOWN)
IN-CAB REMOTE PENDANT CONTROL, RATED @ 8.7-TONS

FUEL FILL BRACKET PER PRINT
6/13/2016

MUD FLAP BRACKET PER PRINT

BRACKET ANTI-SAIL CHROME

PIONEER MANUAL ECONOMY TARP
8'-11' MESH W/DELUXE HDWE

LS400 LANDSCAPE KIT W/PULL BAR

3/8" SPRING-LOADED BOLT SNAP

CONDUIT HANGER W/BOLT/NUT

MISC. PAINT

*** CONTINUED NEXT PAGE ***

KNAPHEIDE
SINCE 1848

KNAPHEIDE TRUCK EQUIPMENT CENTER

KNAPHEIDE TRUCK EQUIPMENT
1200 S. AVERILL AVE
FLINT MI 48503
810-744-0295
FAX #: 855-629-4643

I N V O I C E
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P.O.
INVOICE:
ORDER: F94265
DATE:

Customer: 7085
LAFONTAINE DJR OF LANSING
6131 S. PENNSYLVANIA AVE.

LANSING MI 48911
517-394-1200
Contact: MARK VANLOO

End User ID:
LAFONTAINE DODGE-LANSING
6131 SOUTH PENNSYLVANIA AVE

LANSING MI
SALES REP: 22
Ship Via:INSTALLER

MAKE:RAM	MODEL:5500	YEAR: 2021	VIN:3C7WRNAL2MG526205
Start:12/21/20	Reqd:03/26/21	FO:47193772	TPC\LPC\FPC: TPC227896

KDBF916-B MARK VANLOO

RUSTPROOF DUMP BODY

HITCH PLATE FOR PINTLE MOUNT

COMBINATION PINTLE HITCH WITH 2-5/16" BALL

ADAPTER PLUG

OEM-STYLE 7-WAY "RV" TRAILER PLUG.

HOOK UP OEM CAMERA

SHOP OUR ONLINE PARTS STORE 24/7 AT WWW.SHOPKTEC.COM

REMIT TO:
KNAPHEIDE TRUCK EQ CENTER
1200 S. AVERILL AVE
FLINT, MI 48503

COMMERCIAL VOLUME
TERMS:N30
LIKE US ON FACEBOOK!

Subtotal	11,353.07
DISCOUNT	-300.00
Sales Tax	0.00
TOTAL	11,053.07

KNAPHEIDE
SINCE 1848

RAM

2021 MODEL YEAR

RAM 5500 CHASSIS TRADESMAN REG CAB 60"C/A 4X4

For more information visit: www.ramtrucks.com
or call 1–866–RAMINFO

FCA US LLC

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION

Base Price: $43,695

RAM 5500 REG CAB CHASSIS
Exterior Color: Bright White Clear–Coat Exterior Paint
Interior Color: Black / Diesel Gray Interior Colors
Interior: Cloth 40/20/40 Bench Seat
Engine: 6.7L I6 Cummins Turbo Diesel Engine
Transmission: 6–Speed Automatic Aisin AS69RC HD Transmission

STANDARD EQUIPMENT (UNLESS REPLACED BY OPTIONAL EQUIPMENT)

FUNCTIONAL/SAFETY FEATURES
Advanced Multistage Front Air Bags
Job Rated
Anti–Spin Differential Rear Axle
Manual Shift–On–The–Fly Transfer Case
Electronic Stability Control
Stationary Elevated Engine Idle
Upfitter Electronic Module (VSIM)
Anti–Lock 4–Wheel Disc Brakes
730–Amp Maintenance Free Battery
180–Amp Alternator
Rear Heavy Duty Stabilizer Bar
Push–Button Start
Sentry Key® Theft Deterrent System
Speed Control
Active Grille Shutters
Automatic Headlamps
Low–Beam Daytime Running Headlamps
Power Accessory Delay
Dash Pass Thru Wire Circuits
52–Gallon Rear Fuel Tank

INTERIOR FEATURES
Integrated Voice Command with Bluetooth®
Full Function Media Hub with 2–USB Plus Aux Port
Instrument Panel Mounted Auxiliary Switches
12–Volt Auxiliary Power Outlet
Air Conditioning
40 / 20 / 40 Split Bench Seat
Behind the Seat Storage / Bin
Tilt Steering Column
Passenger Side–Sun Visor with Mirror
Rear–View Day / Night Mirror
Driver / Passenger Assist Handles
Front Height–Adjustable Shoulder Belts
Uconnect® 3.0
Black Vinyl Floor Covering

EXTERIOR FEATURES
19.5–Inch x 6.0–Inch Steel Wheels
7–Pin Trailer Wiring Harness
Folding Trailer–Tow Mirrors
Clearance Lamps
Tow Hooks
Tinted Windshield Glass
Tinted Glass Windows

OPTIONAL EQUIPMENT (May Replace Standard Equipment)	
Cloth 40/20/40 Bench Seat	$295
Customer Preferred Package 2YA	
Cold Weather Group Engine Block Heater	$175
Electrical Accessory Group Trailer Light Check	$545
Heavy–Duty Snow–Plow Prep Group Heavy–Duty Front Suspension Group Transfer Case Skid–Plate Shield	$345
Max Tow Package	$695
Chrome Appearance Group	$870
Tradesman Level 1 Equipment Group Power Black Trailer–Tow Mirrors Remote Keyless–Entry Speed–Sensitive Power–Locks Power Windows with Front One–Touch–Down Feature	$995
6–Speed Automatic Aisin AS69RC HD Transmission	$1,600
6.7L I6 Cummins Turbo Diesel Engine	$7,945
Power Take–Off Prep	$295
Chrome Tubular Side Steps	$495
225/70R19.5G All Traction Tires	$250
Uconnect® 3 with 5–Inch Display SiriusXM® with 6–Month Radio Sub Call 800–643–2112	$695
ParkView® Rear Back–Up Camera	$495
Manual DPF Regeneration	$245
Destination Charge	**$1,695**

TOTAL PRICE: * $61,330

WARRANTY COVERAGE
5–year or 100,000–mile Powertrain Limited Warranty
3–year or 36,000–mile Basic Limited Warranty.
Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

5 YEAR/100,000 MILE POWERTRAIN WARRANTY

Assembly Point/Port of Entry: SALTILLO, MEXICO S L SHIP TO: SOLD TO:

VIN: 3C7–WRNAL2MG–526205 L4–VON: 3772 1219–3

THIS LABEL IS ADDED TO THIS VEHICLE TO COMPLY WITH FEDERAL LAW. THE LABEL CANNOT BE REMOVED OR ALTERED PRIOR TO DELIVERY TO THE ULTIMATE PURCHASER.

* STATE AND/OR LOCAL TAXES IF ANY, LICENSE AND TITLE FEES AND DEALER SUPPLIED AND INSTALLED OPTIONS AND ACCESSORIES ARE NOT INCLUDED IN THIS PRICE. DISCOUNT, IF ANY, IS BASED ON PRICE OF OPTIONS IF PURCHASED SEPARATELY.

EPA DOT Fuel Economy and Environment

Fuel Economy
N/A
combined city/hwy city highway
N/A gallons per 100 miles

Heavy duty vehicle, no label required.

You spend N/A in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost N/A

Fuel Economy & Greenhouse Gas Rating (tailpipe only) 1 — 10 Best

Smog Rating (tailpipe only) 1 — 10 Best

fueleconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5–STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash, or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1–888–327–4236

MOPAR. VEHICLE PROTECTION
A PRODUCT OF FCA US LLC
Ask for Mopar Vehicle Protection for your vehicle. We Built It. We Back It.

Retail Price
Truck $61,330
Dump Box 11,054
$72,384

City Price: $59,370

Finding t
LaFontaine Chrysler Jee
6131 S. Pe

Back To Search Results

Shar

Family

Vie

021 Ram 5500 Regular Cab DRW 4x4, Knapheide R

Back To Search Results

oto shown is a stock image and not an image of this exact vehicle. Contact us for more information.

Dump Bodies Literature

Watch Video

Hide Body Details

Manufacturer	KNAPHEIDE SINCE 1848
Body Type	Dump Body
Body Line	Rigid Side
Body Model	KDBF916A
Inside Body Length	111"
Inside Body Width	86.9"
Side Height	16"
Sides	Fixed
Dump Body Capacity	3.29 Yard
Hoist	Champion 11' Subframe Hoist
Bulkhead	22" High
Body Weight	1468 lbs.

Agenda Item: NB-7
Date: 08-05-2021

City Council Agenda Item Request

Date: July 21, 2021

Name: Jeff Lampi

Department: Wastewater Dept.

Item: Asbestos Removal Bid

Meeting date requested: 8/5/21

Explanation for request:

Administration is requesting Council's approval to hire and retain the services of Pearson Asbestos Abatement of Escanaba, MI, for the removal of asbestos at the City of Escanaba Wastewater Plant in an amount not to exceed $18,000.00.

Wastewater Dept.

MEMO

To: Patrick Jordan, City Manager
From: Jeff Lampi, W & WW Supt.
Date: July 21, 2021
Re: Wastewater Asbestos Bid – 2021

With your approval I would like to award Pearson Asbestos Abatement the bid for WWTP Improvements – Asbestos Removal - 2021 at the Wastewater Treatment Plant regarding the Project Plan.

It was decided that project costs could be curtailed if the city was responsible for all of the asbestos mitigation during the demolition of the 1930's primary tanks.

With that in mind work for all the asbestos mitigation was bid out according to City Policy. Four contractors meet at the Wastewater plant for a pre-bid site visit, and Pearson Asbestos was the only one who submitted a bid for this work.

Said work was bid at a cost of $17,241.50.

7-13-21
2:00 p.m.

CITY OF ESCANABA
RECORD OF BIDS

DATE BIDS OPENED: 7/13/2021
DESCRIPTION OF ITEM: Escanaba WWTP Improvements - Asbestos Removal

NAME OF BIDDER	TOTAL PROJECT COST	Certifed Check/ Bid Bond
Pearson Asbestos	17241.50	Bid bond

PRESENT:

Tracey Uppers

Agenda Item: NB-8
Date: 08-05-2021

City Council Agenda Item Request

Date: 7/29/2021

Name: Jeff Lampi

Department: Water Department

Item: Proposal - DWSRF - Water Plant Improvements Project

Meeting date requested: 8/5/2021

Explanation for request:

Administration is requesting Council's approval to hire and retain the engineering services of C2AE of Escanaba, MI, to assist the City with regard to phase one of the engineering plans for the Water Treatment Plant (WTP) Improvements Project in an amount not to exceed $196,000.00.

Total Engineering for the project shall not exceed $735,200 should the City accept the DWRF loan.

1211 Ludington St.
Escanaba, MI 49829
O: 906.233.9360
www.c2ae.com

July 28, 2021

Mr. Jeff Lampi
Utilities Superintendent
City of Escanaba
PO Box 948
Escanaba, MI 49829

Re: Proposal for Engineering Services: DWSRF Water Treatment Plant (WTP) Project

Dear Mr. Lampi,

The second component of the DWSRF Project Plan is the Water Treatment Plant Upgrades. C2AE and the City of Escanaba will need to be attentive to the overall project schedule to meet State funding guidelines. Final Project Plan report has been assembled and submitted to EGLE before the July 1st, 2021 deadline.

In order for the project to proceed, the next step will be the development of Preliminary Engineering Plans for the WTP Project. This will involve preparation of the Basis of Design, preliminary drawings, outline specifications and written descriptions of the project. In addition, soil borings, on-site investigations, control surveys, and SHPO Clearance will be needed in preparation of these documents.

The schedule set by EGLE to meet their 4th Quarter financing guidelines requires a preliminary plan and specification submittal no later than February 4th, 2022. However, if CDBG grant funding becomes available, the timeline will be reduced by several months. To meet this time scale, C2AE and the City will need to move forward with Preliminary Engineering Phase quickly.

In our efforts to secure the maximum amount of State grant funding and potential CDBG grant funding for the WTP, both the Lead Service Line Replacement Project and the Water Plant Improvements need to be bid out and under construction in 2022. By doing so, Escanaba was placed very high on the EGLE preliminary priority list for the State. Per my discussions with EGLE staff, it is very promising that Escanaba will be funded the $2 million in DWI grant funds and $3 million in loan for the WTP Project. In addition, CDBG grant funding looks just as promising which could bring $1.8 million in grant. Formal notice, however, of total project acceptance will not be provided by EGLE until later this summer.

I have attached the EJCDC Agreement for Professional Services prepared for the Water Plant Improvement Project. C2AE is requesting the City of Escanaba authorize C2AE to proceed with the following Engineering Services line items to keep in sequence with financing schedules.

- Basis Of Design Phase: $ 80,000
- Preliminary Engineering Phase: $100,000
- Additional Services – Soil Borings: $ 6,500
- Additional Services – Control Survey: $ 6,000
- SHPO Archeological Investigation: $ 3,500

$196,000 Total

Total Professional Engineering Agreement Amount for Water Treatment Plant Project: $735,200

Basic Services and Additional Engineering Services can be found in Exhibit C of the Agreement. These costs are identical to what has been programmed into the Project Plan and are part of the overall budget. Engineering costs can be reimbursable to the City once project financing has been completed through EGLE.

This letter would limit C2AE to the Task and Phases of work listed above for the project. C2AE will request future approvals to proceed with the other components of the design as they arise and once formal notice on full funding amounts from EGLE and CDBG are provided.

C2AE thanks the City of Escanaba for the opportunity to work in our home town and build a better community. We look forward to working with you and your staff on this project.

Respectfully,

Darren Pionk, P.E.
C2AE – Project Manager

Agenda Item: NB-9
Date: 08-05-2021

City Council Agenda Item Request

Date: 7/29/2021

Name: Jeff Lampi

Department: Water Department

Item: Proposal - DWSRF Lead Service Line Replacement (LSLR) Project

Meeting date requested: 8/5/2021

Explanation for request:

Administration is requesting Council's approval to hire and retain the engineering services of C2AE of Escanaba, MI, to assist the City with regard to first phase of the engineering plans for the DWRF Lead Service Line Replacement Project for the City of Escanaba Water Treatment Plant in an amount not to exceed $129,100.00.

Total Engineering for the project shall not exceed $754,400, should the City accept the DWRF loan.

1211 Ludington St.
Escanaba, MI 49829
O: 906.233.9360
C: 906.675.1587
www.c2ae.com

July 13, 2021

Mr. Jeff Lampi
Utilities Superintendent
City of Escanaba
PO Box 948
Escanaba, MI 49829

RE: Proposal for Professional Services: DWSRF Lead Service Line Replacement (LSLR) Project

Dear Mr. Lampi,

As the City of Escanaba moves forward with Lead Service Line Replacements Project, C2AE and the City have to be attentive to the overall project schedule to meet State DWSRF quarterly project funding guidelines. Final Project Plan report has been assembled and submitted to EGLE before the July 1st, 2021 deadline.

In order for the project to proceed, the next step would be the development of the Preliminary Engineering Plans for the LSRL Project. This will involve preparation of preliminary design phase documents consisting of final design criteria, preliminary drawings, outline specifications and written descriptions of the project. In addition, soil borings, on-site investigations and SHPO Clearance will be needed in the preparation of these documents.

The schedule required by EGLE to meet their 3rd Quarter financing guidelines requires a preliminary plan and specifications submittal no later than November 20th, 2021. To meet this time scale, C2AE and the City will need to move forward with the Preliminary Engineering Phase fairly quickly.

In our efforts to secure the maximum amount of State grant funding for the City of Escanaba, both the Lead Service Line Replacements Project and the Water Plant Improvements need to be bid out and under construction in 2022. By doing this, Escanaba was placed very high on the EGLE preliminary priority list for the State. Per my discussions with EGLE staff, it is very promising that Escanaba will be funded the $3 million in Booker grant funds and $2 million in loan for the LSLR Project. However, formal notice of total project acceptance will not be provided by EGLE until later this summer.

I have attached the EJCDC Agreement for Professional Services prepared for the Lead Service Line Replacement Project. C2AE is requesting the City of Escanaba authorize C2AE to proceed with the following Engineering Services line items to keep in sequence with 3rd Quarter financing schedule

- Preliminary Engineering Phase: $100,000
- Additional Services - Soil Borings: $ 11,000
- Additional Services – Building Service Investigations: $ 11,600
- SHPO Archaeological Investigation: $ 6,500

$129,100 total

Total Professional Engineering Agreement Amount for Lead Service Line Replacement Project: $754,400

Basic Services and Additional Engineering Services can be found in Exhibit C of the Agreement. These costs are identical to what has been programmed into the Project Plan and are part of the overall budget. Engineering costs can be reimbursable to the City once project financing has been completed through EGLE.

This letter would limit C2AE to the Preliminary Engineering Phase, Soil Borings, Site Investigations and SHPO Review of the project. C2AE would request future approvals to proceed with the other components of the design as they arise and once formal notice on full funding amounts from EGLE are provided.

As for the Water Plant Improvement component of the DWSRF, C2AE has proposed 4th Quarter Financing. One reason why this is scheduled for a later financing period is the potential for a CDBG grant to assist with construction costs. The Clearwell component of the treatment plant has passed the first round of review by MEDC, which is a very good sign. The Engineering Services Agreement will need to wait until further notice from MEDC on grant approval before we can begin this design work.

C2AE has the history and experience to fully assist Escanaba with the design and construction phases of the Lead Service Line Replacement Project. We look forward to working with you and your staff on this project.

If you have any questions, please contact me at your earliest convenience.

Respectfully

Darren Pionk, P.E.
C2AE - Project Manager

Agenda Item: NB-11
Date: 08-05-2021

City Council Agenda Item Request

Date: July 28, 2021

Name: Gerald Pirkola

Department: Electric Department

Item: Purchase Pickup Truck

Meeting date requested: August 5, 2021

Explanation for request:

The Electric Department is in need of a pick up truck for the Crew Leader for meeting with customers and contractors and for planning daily work for the linemen. $35,000.00 was budgeted for a pick up truck for fiscal year 2021-22. Two quotes were received through the MiDeal vehicle purchase program. I'm requesting approval to move forward with purchasing a 2022 Ford pickup truck from Riverside Ford in Escanaba for a total of $32,788.00.

CNGP530 VEHICLE ORDER CONFIRMATION 07/22/21 14:44:05
==> _____ Dealer: F41614
2022 F-SERIES SD Page: 1 of 2
Order No: 0722 Priority: D1 Ord FIN: QD226 Order Type: 5B Price Level: 230
Ord PEP: 600A Cust/Flt Name: CITY OF ESKY PO Number:

		RETAIL			RETAIL
X2B	F250 4X4 S/C	$40285		FLEET SPCL ADJ	NC
	164" WHEELBASE			10000# GVWR PKG	
BY	SCHL BUS YELLOW	660	41P	SKID PLATES	100
1	CLTH 40/20/40	100	425	50 STATE EMISS	NC
S	MEDIUM EARTH GR		43C	110V/400W OUTLT	175
600A	PREF EQUIP PKG		473	SNOW PLOW PREP	250
	.XL TRIM		512	SPARE TIRE/WHL2	NC
572	.AIR CONDITIONER	NC			
	.AMFM/MP3/CLK			TOTAL BASE AND OPTIONS	45520
996	.6.2L EFI V8 ENG	NC		TOTAL	45520
44S	6-SPD AUTOMATIC	NC		*THIS IS NOT AN INVOICE*	
TBM	LT245 BSW AT 17	165		*TOTAL PRICE EXCLUDES COMP PR	
X3E	3.73 ELOCKING	390			
	JOB #1 BUILD			* MORE ORDER INFO NEXT PAGE *	
	TRAILER TOW PKG			F8=Next	

F1=Help F2=Return to Order F3/F12=Veh Ord Menu
F4=Submit F5=Add to Library F9=View Trailers
5006 - MORE DATA IS AVAILABLE. QC09523

With Plowprep.

$45,520.00
$4,760.00 Dlr Dis.
230.00 Doc fee
15.00 Title
$41.005.00
$8.217.00 Gov't CPA
$32,788.00

CNGP530 VEHICLE ORDER CONFIRMATION 07/22/21 14:44:18
==> _____ _____ Dealer: F41614
2022 F-SERIES SD Page: 2 of 2
Order No: 0722 Priority: D1 Ord FIN: QD226 Order Type: 5B Price Level: 230
Ord PEP: 600A Cust/Flt Name: CITY OF ESKY PO Number:

		RETAIL		RETAIL
52B	BRAKE CONTROLLR	$270		
525	CRUISE CONTROL	235	TOTAL BASE AND OPTIONS	45520
	JACK		TOTAL	45520
66S	UPFITTER SWTCH	165	*THIS IS NOT AN INVOICE*	
67E	240 AMP ALTRNTR	85	*TOTAL PRICE EXCLUDES COMP PR	
76C	EX BACKUP ALARM	140		
794	PRICE CONCESSN			
	REMARKS TRAILER			
85S	TOUGH BED	595		
86M	DUAL BATTERY	210		
	SP DLR ACCT ADJ			
	SP FLT ACCT CR			
	FUEL CHARGE			
B4A	NET INV FLT OPT	NC		
	DEST AND DELIV	1695		

F7=Prev
F1=Help F2=Return to Order F3/F12=Veh Ord Menu
F4=Submit F5=Add to Library F9=View Trailers
5099 - PRESS F4 TO SUBMIT QC09523

GORNO FORD
22025 ALLEN ROAD
WOODHAVEN, MI 48183

DATE: **7/22/21** ***F-250***

TO: GERRY PIRKOLA, CITY OF ESCANABA (ELEC.)
906-786-0061 (DIRECT) gpirkola@escanaba.org

FROM: JIM AGNEY, GORNO FORD, GOVERNMENT & FLEET SALES
734-671-4033 (DIRECT) jagney@gornoford.com

RE: **MiDEAL 4WDL-0077 - (1) *2022MY* FORD *F-250*, *4x4, EXT.. CAB, 148"WB,* 6 ¾' Box, SCHOOL BUS YELLOW/STEEL VINYL, 6.2L V8, 6spd.A/Tw/OD, A/C, AM/FM/CMP3w/CLOCK/SYNC, PWR. DISC BRKSw/ABS, AIR BAGS, *3.73 REG. AXLE*, 10,000 # GVWR, *LT265/70R-17AT*, TRAILER TOW PKG., TILT/CRUISE, H.D. TOW PKG. ADVANCE TRACw/ROLL STABILITY CNTRL., DRL's, FRNT. TOW HOOKS, TPMS, *PWR. WINDOWS/LOCKS/Htd.MIRRORS*, UPFITTER SWITCHES, DÉCOR TRIM, *ELEC. BRAKE CNTRLR.* H.D. ALT., DUAL BATT., DAYTIME RUNNING LIGHTS, *PLOW PREP, H.D. SUSPw/REAR SWAY BAR,* FACTORY RUNNING BOARDS**

F.O.B. DELIVERED TO SOUTH SIDE OF MACKINAC BEIDGE , MI..... $33,461.00
(MSRP = $46,675.00)

Current lead time to order 2022MY is estimated at 30 - 36 weeks from receipt of Purchase Order.

RECOMMENDED OPTIONS:

MUNICIPAL SAFETY LIGHT PKG. (Incl; Amber LED Roof Mount Mini Light Bar, Fr./Rr. LED Amber Flashers) ..	**1,795.00**
LOCKER REAR AXLE	**390.00**
SKID PLATES	**100.00**
ENGINE BLOCK HTR.	**100.00**
LED ROOF CLEARANCE LIGHTS	**95.00**
REVERSE SAFETY BEEPER	**149.00**
8.0' BED ..... (ADD)	**400.00**
RHINO SPRAY-IN BED LINER	**679.00**
ALL-WEATHER H.D. RUBBER FLOOR MATS	**89.00**
BOSS VXT-8'2"" V-BLADE STEEL PLOW SYSTEM w/DEFLECTOR	**7,762.00**
(straight blade Boss 8'2") ..... (DEDUCT)	**<500.00>**
WESTERN 8.5' MVP3 V-BLADE PLOW SYSTEM w/DEFLECTOR	**6,795.00**
(straight blade Western 8.5') ..... (DEDUCT)	**<500.00>**
Optional LED Lighting for Western Plow	**550.00**
BUYER'S 2.0 cubic yd, Poly Salt Spreader	**4,995.00**
WESTERN Stainless Steel 2.0 cubic yd. Salt Spreader	**5,695.00**
DELIVERY TO ESCANABA ..... (ADD)	**500.00**

Please review *SELECT OPTIONS*, sign and e-mail back or e-mail Purchase Order to Jim Agney.

Customer Signature: _____

Thank you,

Jim Agney

Agenda Item: NB-11.
Date: 08-05-2021

City Council Agenda Item Request

Date: July 29, 2021

Name: Gerald Pirkola

Department: Electric & Water Depts

Item: Advanced Metering Infrastructure - AMI

Meeting date requested: August 5, 2021

Explanation for request:

Bids were received on June 15, 2021 for Advanced Metering Infrastructure (AMI) for reading both Electric and Water meters. On July 14, 2021 the Electrical Advisory Committee (EAC) was presented with the AMI information and quotes. The EAC supported moving forward with the AMI project and recommended using Tantalus Systems as the supplier for AMI.

The Electric Department is requesting approval to enter into an agreement with Tantalus Systems in an amount not to exceed $800,000. The funds are in the 2021/22 capital budget.

The Water Department is requesting approval for $63,540.92 to cover one half of the base infrastructure of the AMI project.

City of Escanaba MICHIGAN

Tantalus Proposal to City of Escanaba Electric Department RFP Advanced Metering Infrastructure

June 9, 2021

Tantalus

Tomorrow's Smart Grid. Today.

Confidentiality Statement

This proposal, including all copies, exhibits, attachments, related materials and subsequent amendments, (collectively, the "**Materials**") contains information that is confidential and proprietary to Tantalus Systems Inc. ("**Tantalus**"). The Materials are provided in confidence for use solely by the recipient to whom it is addressed and only for the purpose for which is the Materials are supplied.

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The recipient shall immediately provide Tantalus with written notification of any request for release of information contained in the Materials immediately upon receipt of the request via electronic mail and USPS at the following physical and electronic mail addresses:

Tantalus Systems Inc.
Attn: Erin T. Gould
1130 Situs Court, Suite 230
Raleigh, NC 27606
Email to: egould@tantalus.com

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While Tantalus' proposal will address customer-provided requirements in the RFP, customer requirements often change between release of an RFP and final contract negotiations. For this reason, the RFP and this proposal response are not intended for incorporation into contract documents in their entirety, but instead should be used as a basis for guiding negotiations in order to establish and finalize contract commitments and obligations.

Tantalus Systems Inc. 1130 Situs Ct., Ste. 230, Raleigh, NC 27606
P: 919.900.8970 | F: 919.900.8978 I www.tantalus.com

June 9, 2021

Jerry Pirkola
Director
City of Escanaba
Electric Department
1711 Sheridan Rd.
Escanaba, MI 49829

Dear Mr. Pirkola:

Tantalus Systems Inc. is pleased to present the City of Escanaba ("Escanaba") with our proposal response to the RFP for Advanced Metering Infrastructure. We appreciate the opportunity to provide you this information.

With commercial headquarters in Raleigh, NC, Tantalus is a leading provider of smart grid applications **exclusively focused on public power and cooperative utilities**. We provide solutions to utilities that want to gain additional insight and control of their network in order to improve operational efficiencies and reliability, manage energy resources more intelligently and improve customer satisfaction. Beyond providing an AMI system platform for electricity and water, the Tantalus Utility Network (TUNet®) supports value-added applications such as distribution automation, load management, pre-pay and streetlight control.

Tantalus offers Escanaba the unique advantages of our proposed solution, which include:

- A commitment to the energy futures of the communities we serve, with more than 185 TUNet customers representing 3 million municipal and cooperative endpoints in North America.
- The ability to continue use of existing Itron electric and water ERT technology, a value proposition that is unique in our industry.
- A "future proof" endpoint with a software definable radio that allows for over-the-air updating, ensuring a modern solution for many years to come.

Tantalus' proposal package consists of this offer letter and the attached documents. Tantalus's pricing and technical responses are subject to due diligence, finalization of work scope, project schedule and negotiation of mutually acceptable terms and conditions.

As Tantalus' solution may include products and services from 3rd party providers, we reserve the right to negotiate terms consistent with the utility, Tantalus and 3rd party requirements. This offer is valid for 90 days and should Tantalus be officially short-listed for this award, we will extend the validity as necessary to complete the selection and contracting process.

We realize this is an important initiative for Escanaba and we respectfully request an in-person meeting to discuss the details of our TUNet proposal. In the meantime, please do not hesitate to contact Chris Christensen at cchristensen@tantalus.com or 325.260.6717. We look forward to a lasting partnership with Escanaba that will support both your current and future needs.

Best regards,

Param Pawar
VP, Finance

Table of Contents

Appendix C:

Vendor's Total Cost and Timeline

Appendix C: Vendor's Total Costs and Timeline

Provide the total one-time or fixed implementation/initiation cost of the AMI solution from your pricing schedule. This should include all costs associated with needed Software, Network, Integrations, Maintenance, Training, Support, Meters, Installation, etc. as per the RFP Documents.

Please provide a period of validity for the cost and any term length requirements for the AMI solution.

$ _____ 749,181.35_____/_____

Installation has been included as an option.

Please provide, separately from the implementation cost, the recurring costs or fees required to maintain and use/access the AMI solution. Indicate the schedule or frequency of these payments (monthly, quarterly, annually, etc). Include any known future increases in fee schedules and their frequency.

List any known third party dependencies that may cause additional incurred costs.

$ _____22,506 Annual Support and Maintenance_____/_

$ _____ /

$ _____ /

_____

_____

_____

Indicate the target date for start of work and or design of the solution for the City of Escanaba. Provide the estimated length of time from start to full deployment. Note any major milestone dates between project initiation and full deployment.

Start: **Full Deployment:**

Project activities will commence upon receipt of a purchase order. Project assumes a 9 month deployment time frame. Milestones and sequencing activities can be seen in the sample project schedule. _____

_____

_____

Executive Summary

Tantalus Systems Inc. is pleased to present the City of Escanaba ("Escanaba") with our proposal response to the RFP for Advanced Metering Infrastructure (AMI).

What Our Customers Need:

By utilizing the Tantalus TUNet® system, municipal utilities can leverage data to deliver higher value and more innovative services to its customers, and improve financial performance while driving operational reliability and efficiency. Tantalus respects the need for municipal utilities to maintain control of their future, and avert a costly solution optimized for large cities and shareholder profits. Utilities like Escanaba have a special mandate to optimize the use of their time, resources and budgets, and be trusted by their communities. The utility has the opportunity to be a driver of economic prosperity and socioeconomic progress. These are just a few of the unique challenges that Tantalus' solution was purpose-built to address.

Tantalus recognizes the unique challenges faced by municipal utilities in this country. The people that the utility serves are counting on Escanaba and Tantalus to realize immediate and long-term value from their smart grid investment, and that infrastructure needs to be one that is also flexible and capable, serving as a foundation for future innovation as smart grid applications evolve over time. An AMI system must meet the current near-term needs while transforming municipal utilities into truly sustainable utilities.

Our Purpose: Building the Sustainable Utility of the Future

Delivery: Safely and reliably deliver electricity, water and gas with next-gen AMI solutions;

Resiliency: Proactively identify vulnerabilities to mitigate outages and prepare for Mother Nature through data analytics;

Environment: Embrace the integration of distributed energy resources (DERs) such as solar, storage and EVs as a controllable-resource for the utility;

Community: Enhance service and responsiveness by proactively engaging with customers to meet increasing expectations.

What We Help Customers Do:

Connect: Devices, Data, and Decisions

TUNet is a two-way, near-real-time communications platform to every meter and TUNet endpoint. We support a multi-application network for Advanced Metering, Demand Response, Distribution Automation, & Grid Optimization.

Learn How to Meet and Anticipate Your Community's Needs

Tantalus is dedicated to supporting the safety, prosperity, and autonomy of communities like Escanaba. The health, well-being, and values of the communities that municipal utilities serve depend on having an energy partner who's fully aligned with you and your future.

Optimize for Current and Future Needs

At Tantalus, we help municipal utilities balance the cost, operational efficiency, reliability, and innovative services to meet today's needs. At the same time, we provide an AMI platform that meets future needs of flexibility and expandability for coming innovations in market technology as well.

Succeed on Your Own Terms and In Your Own Time

Tantalus is unique in that 100% of our smart grid network deployments are being used by municipal and cooperative utilities. For 30 years, and our heritage, business model, solutions and company culture are completely aligned with this commitment, making sure that municipal utilities and the communities they serve continue to grow and thrive.

Our Unique Value Proposition to Escanaba:

One example of Tantalus' value to Escanaba and their citizens relates to the investment in existing electric metering technology. Over the years, the city's citizens have invested significant dollars in electric and water ERT technology to automate your meter reading and data reporting processes. Tantalus has worked alongside Itron along with our many public power users who have expressed an interest both in extending and expanding the value proposition of their technology while at the same time leveraging a 2-way fixed network to form the communications platform for AMI and smart community applications.

Tantalus offers Escanaba our unique ERT overlay deployment option where a significant portion of the capital expense can be deferred to future years, while enjoy enjoying a suite of AMI capabilities. Our unique solution replaces non-ERT electric meters with TUNet equipped meters to "overlay" the electric ERT population with AMI capable meters. These AMI meters listen for the electric and water ERT protocol and then relay the readings to the head end on a daily basis for electric, and hourly for water, providing a significantly larger amount of data from the same in-place meters. The head-end is the same for both the ERT and the AMI meters, with a seamless integration to the CIS for billing purposes. Now the majority of

AMI functionality is available on day 1, with the remainder of meters being migrated over the future years at the utility's pace and as budgets allow.

The ERT overlay implementation mitigates the tradeoff between solving near term objectives, while at the same time deploying a platform for future innovation. The ERT overlay concept presents the ability to control capital expense allowing Escanaba to better manage budgets while gaining a significant portion of AMI functionality, and establishing a foundation for future growth.

Our Goal: Align our Purpose with Our Customers' Purpose

• To help these communities thrive by helping our customers power their economic prosperity, environmental sustainability and social progress;

• To ensure these communities are empowered to shape the future of their own smart grids as the adoption of distributed energy resources such as solar panels, distributed storage and electric vehicles transform the requirements of distribution grids; and

• To give our customers the flexibility and expandability they need to serve their communities today and well into the future.

What Makes Us Different:

Tantalus has an unrivaled commitment to this market, with 100% of our customers, 100% of our revenue, 100% of R&D funding and 100% of our endpoints deployed in the Municipal and Cooperative market. Our purpose-driven solutions are developed specifically for Escanaba and their unique needs, and were co-created with our customers, not cookie-cutter solutions meant for big cities. TUNet design can be used by current utility staff; there is no need to be an IT expert or data scientist to use our solutions.

We emphasize flexibility for what your customers need today, with near-real-time data delivery to enable a faster and more impactful response. Additionally, our system offers network expandability for what Escanaba will need tomorrow, with unrivaled computing power at the edge, and open systems that are compatible with other hardware and software platforms.

As a company, Tantalus is independent and autonomous, just like Escanaba. We are not beholden to any hidden shareholder agendas, and provide access to senior decision-makers, with client input into our product roadmaps.

Response to Requirements and Details

Requirements and Details

The City of Escanaba is looking for a cost-effective AMI solution that will modernize their current metering infrastructure. At a minimum, the proposal shall provide for these requirements:

- The system shall maintain time synchronization for all meters, nodes, and other devices connected to the network and provide time-stamp capabilities

  TUNet is synchronized to the NIST atomic clock, ensuring the accuracy of readings within +/- 1 second across the network. Time is broadcast to all network devices at least once every 15 minutes. Metering devices maintain +/- 1-second reporting accuracy.

- All AMI meters shall be uniquely identified in the network

  The unique network identification assigned by Tantalus during manufacturing and registered with the TCC is required to communicate with individual devices. TUNet will not recognize any communication device that does not submit a valid endpoint ID. The WAN Transceivers must be manually associated in the TUNet network. The system will not communicate with unassociated units.

- All residential electric AMI meters shall provide a minimum of 60-minute meter reads delivered hourly; C&I AMI meters shall have 15-minute intervals delivered at a minimum

  TUNet supports interval data at 5, 15, 30, and 60-minutes intervals. Data is pushed from the endpoint to the headend within the next interval i.e., 15-minute data is pushed every 15 minutes. The proposed solution was designed to support 60-minute interval data on residential meters and 15-minute intervals on commercial meters.

- AMI meters shall collect and send ERT (both electric and water) readings through the network to the head end.

  Comply, TUNet equipped endpoints and network infrastructure can intercept ERT transmissions and relay them to the head end.

- Head end software shall provide a file consumable by ***Itron FCS*** to process reads collected by AMI

  Comply, the TUNet head-end has the ability to integrate to the existing FCS software that is already integrated to your billing system. There will be minimal disruption to your current billing processes. This allows you to move to AMI with the lowest technical risk.

- All AMI meters shall have the ability to monitor and report voltage and/or current in a manner that allows the utility to react to the information

  Voltage is reported with every interval read. In addition, the system can be configured to provide voltage snapshots periodically. TUNet residential meter modules measure voltage over a range of 175 to 280 volts to an accuracy of +/- 3 volts. Sag and swell alarms can be established per meter to monitor for voltages that stray below or above user-defined sag and swell thresholds for a defined period. The period can vary between 15 seconds to 15 minutes in 15-second increments. With the ability to have a unique sag/swell configuration for each meter, the utility can keep closer watch on specific bellwether meters while allowing others to have more voltage tolerance.

- The system shall support two way communications and remote programming capability

  The TUNet system supports full two-way communications between AMI-enabled endpoints

and infrastructure devices. TUNet-equipped devices support remote reprogramming and upgrading of the communication modules including things such as schedule changes (e.g., interval read frequency). The TUNet communication module contains a Software Configurable Radio, allowing firmware upgrades to change/enhance communications protocol.

Tantalus utilizes a NIST compliant "over-the-air" upgrade (OTAP) protocol to securely download new firmware on all products. This allows utilities to remotely (over-the-air) upgrade firmware of deployed TUNet devices when new functions, fixes and features become available. All deployed meters can be upgraded at the same time or in groups.

- The system shall support net metering and allow for customer monitoring

  Most of Tantalus's customers have leveraged the household meter's net metering functionality to track how much energy is flowing back onto the grid from solar installations. Net metering is supported on all meter types supported by TUNet. On the Sentinel (C&I meter) net metering can be purchased as an option, and net metering is included on the base model of all other meters. TUNet can report delivered and received energy registers, or net (delivered-received) if preferred.

  There are 2 ways for customer monitoring to occur, either through a customer web portal, or through the direct connection to the KYZ port on a polyphase meter. Tantalus is happy to explore either option for the utility with additional information provided.

- The system shall support time of use (TOU) metering capability

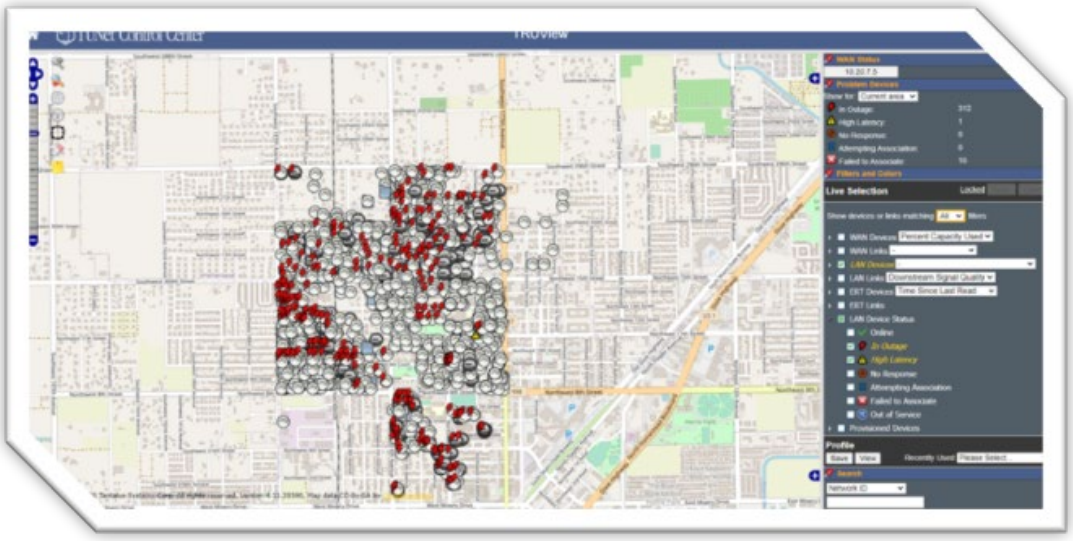
  Tantalus will soon offer our customers the ability to do TOU; it is on our roadmap for 2022.

  The TOU capability will not require any new hardware and is only a head-end software and module firmware update.

  Tantalus' TOU solution will be interoperable on any of the metering platforms we support (Itron, Aclara, Landis+Gyr), will not require a battery, and will make data available to a portal for informing the customer.

- The system shall support outage detection, restoration, and reporting (OMS)

  Many of our customers deploy AMI without an Outage Management System (OMS), as TUNet Control Center (TCC) and TUNet Insight® has many of the features that OMS solutions offer.



Tantalus' near-real-time data, provided using out TRUPush® technology, makes all the difference when it comes to outages. Once a problem occurs, the outage is pushed to the head-end where it is displayed on a system map, a manner simple and easy to understand by utility personnel. Simply put, we tell you what isn't working when it stops working.

Supercapacitors continue to provide power to the device after AC voltage is lost, and Gateway devices use batteries to maintain power for several hours. These combine to keep the network operating to report outages. TUNet module immediately sends an outage message, which includes the time of the outage and the kWh register reading at the time of the outage, through the network to the TUNet head end.

TUNet outage and restoration messages are sent only on defined message paths rather than broadcasting them to all devices as some other systems do. While it may seem intuitive that broadcasting increases the probability of a message getting through the network, it can actually have the opposite effect in a large outage scenario, because if a large number of meters are all doing this at the same time, collisions will occur, and the messages won't get through. Better reliability is achieved by managing network traffic more intelligently and limiting the number of messages to only what is necessary. TUNet manages network traffic by acknowledging all messages, including outage messages. Systems that do not acknowledge outage messages have to send each message several times since there is no way to confirm that it got through the network. This flooding of the network with unnecessary retries can cause collisions and prevent other messages from getting through, especially in a large outage scenario. Acknowledging all messages enables TUNet to avoid this problem by retrying only messages that are not acknowledged. Additionally, beneficial is the ability to define additional attribute fields such as transformer, feeder and phase, allowing for quick identification of the problem scenario.

TUNet's robust TRUPush technology typically results in 85-100% of devices successfully reporting outages to the headend within 50 seconds of the onset of the outage. To handle all this data and filter from reclosing events, TUNet provides multiple levels of outage filtering.

Filtering in the end device: The outage notification period can be programmed with a threshold of from 1 to 10 seconds. Momentary outages less than the threshold are accumulated in an internal blink counter and reported with the power quality measurement data message (typically every 6 hours). Momentary outages greater than or equal to the outage notification threshold result in outage messages. These messages, including timestamp and full-scale register read, are pushed to Insight in near real-time.

Filtering in the head-end: The TUNet Control Center can prevent momentary outages from being delivered to the outage management system. Insight can be configured to only report outages that last longer than a specified amount of time – typically 5 minutes for most utilities. If the corresponding restoral message comes in within that time, the outage is not reported to the OMS. This eliminates nuisance calls and truck rolls for momentary outages. TUNet allows the utility to define the time threshold for what constitutes a momentary loss of power (blink), and what is defined as an outage. Blinks are recorded and reported under the Power Quality Management section of the TUNet Control Center.

Network Restoration Reporting

When power is restored, the device attempts to get time from the network. This usually happens within seconds. Once the device knows the time, it calculates the time when power is restored, and immediately sends a time-stamped restoral message through the network to the head-end. Typically, 90% of restoration messages are reported to the head-end within

one minute after restoration, and 100% within 5 minutes, assuming the network infrastructure devices that the meter communicates with have also powered up or are still being powered by their batteries. If this is not the case the device will know to retry sending the restoral message once power has been restored to its parent device. Should the restoral of a parent take an extended period of time, the device will initiate self-healing to find an alternate path back home. To eliminate ghost outages whereby several meters appear in outage due to an upstream communication problem, most modern OMS systems will accurately predict the clearing of the outage.

Upon receipt of the restoral message, or any other message from a device that was in an outage state, the head-end reports the restoration on the event monitor and, if enabled, by email or text, and clears the outage. Meters that were unable to successfully send their outage message through the network before the supercapacitor discharged will send their outage message with the restoral message, so that the fact that they were in outage is recorded, along with the time of the outage and restoral, but the outage is immediately cleared.

Nested outages

Tantalus' network architecture is optimized for timely delivery of large volumes of outage alerts within a short period of time and without being affected by communication bottlenecking that can occur in other IOT and AMI systems. This ensures a high number of alerts are received within a timely manner and before crews leave the area. Tantalus customers have benefitted from this because they can check on the Insight head-end outage map for any residual nested outages that crews may have missed that their OMS system may have closed in error.

- The system shall support remote disconnect and reconnect for residential meters

  TUNet supports remote disconnect/reconnect of electric meters provisioned with a disconnect switch. The disconnect/reconnect can be initiated from the TCC headed or from a third-party application such as a CIS or MDMS integrated to TUNet and with appropriate licensing.

- The system shall support near real-time power quality data to support distribution engineering analysis, and other distribution system applications

  TUNet reports instantaneous voltage per interval with every kWh recorded interval length for all meters (end of interval snapshot). Instantaneous current per phase is also provided on polyphase meters.

  TUNet will support metering devices such as DNP3 capable RTUs provided that the system can accommodate polling rates of between 5 and 15 minutes depending on the WAN backhaul type. The data can then be fed back into the utility SCADA system or distribution engineering software for energy flow analysis.

  AMI metering data from transformer rated meters can also be provided to the SCADA system via the Tantalus CLVR bellwether meter application or through the Tantalus MultiSpeak meter interface.

  Below are examples of metrics displayed on the head-end:

  · Event Monitor – Monitors network for power outages and power quality events in real-time

  · Report of consumption & power quality for a specified period, by meter or group of meters· Report of missing consumption and power quality readings for a specified period

· Report blink count and minimum/maximum voltage, by the meter or by a group of meters for a specified period

· Report of single-phase power quality events, by the meter or by a group of meters for a specified period

- The system shall readily integrate with existing or future SCADA, MDM, OMS, CIS, and GIS system via standard protocols

  TUNet has integrated with all desired applications, and we have included a graphic detailing some of our most common integration partners.

Tantalus integrates through standard protocols including flat-file, MVRS/FCS, and MultiSpeak to name a few.

Additionally, the Vendor responsibilities include:

- Train City staff on retrofitting of existing solid-state meters and installation of network elements

  Yes, we have included a field programming/shop tool with this proposal that will allow the utility to program meters, enabling the ability to retrofit existing electric meters at the utility.

  Additionally, there is training provided on the practice of retrofitting, as well as the installation and troubleshooting of network elements.

- Conduct system acceptance testing

  Tantalus has provided a sample SAT. The test plan will be modified based on scope and mutually agreeable testing criteria.

- Design AMI network to meet outlined requirements

  Tantalus is proposing an AMI system that has been designed to meet the requirements defined in the RFP and to provide network coverage to all meters in the utility service territory.

  Tantalus is the leader in multi-commodity AMI and software interoperability in the utility industry. One example is Tantalus' commitment to sustaining and leveraging utility investments in ERT technologies while providing seamless and risk-averse methods to migrate

entire systems to our industry-leading AMI 2-way, multi-commodity TRUEdge network. Specifically, Tantalus is unique in the industry with Itron-licensed ERT drive-by protocols by way of providing a fixed network overlay that can intercept all the utility's Itron electric ERTs when roughly 1 in 7 electric meters have been replaced with TRUEdge equipped AMI meters. This solution provides the majority of Tantalus' innovative AMI functionality at a fraction of the cost to "rip and replace" all the electric ERTs. The ERT overlay implementation allows utilities to selectively deploy two-way AMI devices in higher-value applications such as industrial/commercial and disconnect customers. Further, the overlay solution delivers value to the utility and your community initially and for the long-term by seamlessly enabling applications such as load management, streetlight management, and outage and voltage monitoring. Secure connectivity to your distribution equipment is a further option with this same network.

- Providing or provisions for acquiring smart meters and/or AMI modules

  For this proposal we have provided indicative pricing from Border States Electric and assume the utility will contract directly with them for the purchase of electric meters. All water meters and MIUs (ERTs) are purchased through United Systems.

  All other products are purchased through Tantalus.

- Provide secure communications within the AMI network, as well as the local area, intermediate and or regional networks, for related AMI functionalities

  All TUNet communications are secured through the use of AES 256-bit encryption, RSA and SHA-2 technologies. TUNet LAN communications security is further enhanced at the physical by utilizing a technique of two-dimensional pseudo-random encoding of the data, which provides best-in-class anti-interception and anti-jamming immunity. The technique, which is modeled after military applications, provides deep parallelism of communications and provides superior security and reliability with profound interception immunity.

  The TUNet system utilizes specific subcomponents of the following standards with respect to security, authentication, and encryption:

  - NERC CIP-005-1
  - NERC CIP-007-1
  - AES symmetrical encryption standard
  - RSA asymmetrical encryption standard
  - Secure Shell SSH-2

  Secure access to the Insight head-end is managed through the use of VPN and standard Secure Shell (SSH). Keys are generated using a standard tool that utilizes a method to generate a random key value. Field operations manage these key pairs and is able to issue and revoke keys for remote access to the customer system. WAN infrastructure consoles also leverage SSH but are firewalled to only allow communications from the head-end system.

  No direct access to TRUEdge modules is possible without secure Tantalus tools. Wireless communications between modules are confidential and fully encrypted with NIST-approved AES-256. Key management is performed in accordance with recommendations in NIST SP 800-57.

- Demonstrate ability to support water (Itron) and electric (Itron, Hunt) ERTs on the same network

Tantalus is unique in our ability to read ERTs (both Itron and Hunt), and we are the only company licensed to read Itron ERTs. By replacing all current non-ERT electric meters, the utility will be able to read, over TUNet, the electric ERTs that remain in the field, as well as water ERTs if currently deployed. This will allow the utility to migrate to a two-way 'smart grid' solution on your own timing - as resources and budget are available. This solution presents the opportunity to defer some of the capital investment in AMI endpoints to the future.

- System must be able to upload the readings into Itron FCS for billing.

  TUNet integrates with MV-RS/FCS via a standard DRE file. Tantalus has successfully integrated to Itron MVRS/FCS for many utilities.

- Provide and provision AMI network management system

  Tantalus Deployment Services includes training on installation, deployment, optimization, system operation training, and ongoing system support.

- Provide training on AMI network management system

  Tantalus project managers typically spend 3 full days on-site during the initial training trips. The first trip is typically geared towards the installers and primary users of the system. This is our "train the trainer" approach. The second trip is typically after meters and devices have been installed on the system and is geared towards a wider audience. This trip will typically have sessions geared towards various roles at the utility. For example, there are usually sessions for CSRs which will learn the primary effect the Tantalus system will have on their position. There could also be a session for billing managers to discuss integrations of CIS and other software with TUNet. These training trips are customized for the needs of the individual utilities including network management as many utilities have different organizational structures.

- Provide implementation support (trouble shooting, network provisioning, other)

  The Deployment Services fee includes Project Management, Field Engineering, User Training. Tantalus will support troubleshooting during implementation as part of the deployment services and after implementation per the Technical Services Agreement.

  Training is a key component to ensure your staff is ready to operate and maintain the AMI system. Tantalus works with your project team to provide training that include Tantalus led and train-the-trainer programs focusing on the deployment and maintenance of all field devices, TUNet user interface for utility operations and network administration and finally, operation of the system as a whole as it is integrated with other utility application.

  TUNet includes an embedded Oracle database which does not require database administration by the utility.

  Please see the included project management approach for details of our deployment approach and methodology.

- Secure delivery of meter reading data into appropriate database(s)

  TUNet sends meter/billing data to an MDM or CIS via flat file or MultiSpeak.

- Support interfaces to other utility applications via MultiSpeak (or other standards as applicable)

  TUNet supports MultiSpeak interfaces for MultiSpeak 3.0 and MultiSpeak 4.1.

  Tantalus has integrated via MultiSpeak to the following application types:

- MDM
- OMS
- Prepay
- CIS
- SCADA
- Engineering Analysis

A list of supported methods can be made available.

- Perform propagation studies as required

  Acknowledged and comply.

Pricing

Please include detailed pricing along with the proposal, including, but not limited to:

software, network, integration, maintenance, training, support, meters, installation, etc. Clearly indicate which items are one-time fees and those that are recurring. Vendors shall use Appendix C for total amount(s).

Acknowledged and Comply. Please see the included detailed price sheet along with the completed Appendix C document provided in the RFP.

Response to Vendor Questionnaire

Vendor Questionnaire

General

1. The City of Escanaba currently has a drive-by meter reading system, can these existing endpoints be utilized in the system being proposed?

   Yes, Tantalus' TRUScan application is unique in the industry with the ability to read multiple communications protocols from Itron (ERT electric, ERT water, and ERT gas), Badger/Orion (CE water), and Neptune (R900 water).

2. What is the frequency of interval reads that can be collected from existing (legacy) meters if left in the field and read by the AMI system?

   In the case of Itron ERTs, the frequency of interval reads depends on the ERT module and can range from daily in the case of the R300 electric ERT, to hourly in the case of the 100-series water ERTs.

3. Would the electric meters/encoders/switches in the system maintain a clock coordinated with NOAA, WWV, GPS or equivalent?

   All TUNet enabled electric meters and TUNet infrastructure devices are synchronized to the NIST atomic clock, ensuring the accuracy of readings to within +/- 1 second across the network. Time is broadcast to all Tantalus network devices at least once per interval as configured.

4. Does your solution provide an AMI communications module for retrofitting existing solid-state electric meters from multiple vendors? Which vendors?

   Yes, the Tantalus network supports meters from multiple manufacturers (Itron, Aclara, Landis + Gyr) all on the same network, and many meter types can be retrofitted depending on the make/model/year.

   Further discussion of the exact meter type and vintage is welcome as to better elaborate on the quantity of meters capable of retrofit.

5. Do you manufacture all components of your proposed network?

   Yes, Tantalus manufactures all network hardware which includes gateways, repeaters, and AMI modules.

6. Do you warranty all components of the proposed network?

   All TUNet hardware and software come with a warranty.

   The meters and any third-party software have a separate warranty from the provider.

7. What deployment options are available for the system?

   The Head End System can be deployed as a virtualized system on-site or can be hosted offsite. For this project we propose a virtualized on-premise solution.

   a. Is there an option for the solution to be deployed and owned by the City?

      Yes, the TUNet head-end system can be deployed in a virtualized environment on

servers owned by the city.

b. Can the solution be hosted off-site?

Yes, the TUNet head-end System can be hosted offsite at an Oracle datacenter.

8. Do your endpoints have the ability to accommodate multiple protocols? Which protocols?

Yes, the TUNet TRUEdge communication module can operate multiple protocols through our TRUScan application which "listens" for Itron, Badger and Neptune RF protocols, and can read and relay this data to the head end.

Additionally, each endpoint and can be reconfigured with new protocols with over-the-air upgrades.

9. Can protocols used by the system be updated over-the-air?

Yes. Each endpoint and can be reconfigured with new protocols with over-the-air upgrades.

10. How does the system scale to accommodate increases in meter population or reporting frequency?

The solution is fully scalable. The proposed solution contains sufficient redundancy that small increases in the device population will not raise the operation and maintenance cost of the system. Typically, our LAN gateways are designed to 80% capacity with 20% spare capacity remaining for growth in population. The headend system is typically designed at 65% capacity for performance reasons allowing significant room for increases endpoints or other desired functionality. If all electric meters are replaced with TUNet equipped meters, then it is possible there will need to be additional collectors.

The increase of meter population or the decrease in interval duration will increase both the network infrastructure and server capacity requirements respectively. The TUNet system is designed with spare capacity to accommodate minor increases in capacity, so specific increases to network traffic should be discussed with the design team to evaluate system impacts/requirements.

11. Can your solution support meters from multiple vendors on the same AMI network?

Yes, TUNet can support multiple meter vendors on the same network. These meter vendors currently include Itron (CENTRON C1S and C2S, SENTINEL), Aclara (i210+, Gen5 kV2c), and Landis+Gyr (FOCUS AXe), with new support in development for the Itron CENTRON 3 Polyphase and the Landis+Gyr s4x Polyphase meters.

System Communications

1. What frequency band(s) of operation does the system utilize at all network levels (LAN, WAN)?

   The LAN communication is unlicensed 902-928MHz. The WAN back-haul proposed is cellular: Verizon - 4G: 700 MHz Block C, Band 13 (LTE). 1900 MHz PCS, Band 1 (1xRTT/ EV-DO/ eHRPD). 1900 MHz PCS, Band 2 (LTE). 1700/ 2100 MHz AWS, Band 4 (LTE). AT&T - 4G: 700 MHz Lower B/C, Band 12/17 (LTE). 850 MHz Cellular, Band 5 (LTE). 1700/ 2100 MHz AWS, Band 4 (LTE). 1900 MHz PCS, Band 2 (LTE). 2300 MHz WCS, Band 30 (LTE).

2. How do you address hard-to-reach meters?

   The design of the TUNet system accounts for hard-to-reach meters. Tantalus offers a low-cost repeater that can be installed at or near the hard-to-reach premise to extend the network range.

   We do offer an external antenna for meters, though they are rarely needed when the system is deployed per the design.

3. Does your system support authentication across all devices in the proposed network?

   During the meter integration process, a registration file for each meter, including a meter serial number paired with a Tantalus network ID, is created. This file is automatically imported into Tantalus' certificate server where the corresponding certificates are pulled from Tantalus' manufacturing database and delivered to the customer's TCC via a secure connection (every Tantalus device is manufactured with a unique certificate). When a meter is installed in the field, the TCC allows it to join the network only if it has received the matching information.

4. Do you support remote firmware upgrade for AMI modules?

   New firmware is transmitted to the TUNet modules using a “broadcast mechanism” to all (or a subset of) devices at the same time. The broadcast mechanism ensures that the time to upgrade is done as efficiently as possible, upgrading many devices at the same time and not via a serial/sequential methodology.

   Firmware updates consist of instructions to go from the device's current image to the new image - resulting in a much smaller "patch" file. This file is further compressed to save even more transmission time.

   Images must be authenticated, and the devices only accept valid images. Once the new firmware is activated, the device performs specific checks to confirm that the firmware is working correctly and if not, automatically “rolls back” to the previous “locked down” image (this monitoring is done via the boot loader which is not part of the firmware being upgraded). If the upgrade was successful, the device will report its new firmware image to the Upgrade Server. If the upgrade was not successful, the device will restart with the previous firmware image and inform the Upgrade Server.

5. Does your solution support remote reprogramming (read interval, demand period, other) for AMI modules?

   Meter measurements and intervals (5-60 minutes), power quality settings (including sag/swell notification criteria), outage settings, demand reset schedules (daily/weekly/monthly/ad-hoc) can be configured remotely either via the user interface or

import file.

6. Does your system support an IP-based interface to the utility access point?

   TUNet can utilize most IP-based backhauls; fiber, WiMAX, radio, cellular, satellite, microwave, etc. All that is required is an RJ-45 connection. The system designed is to support IP-based systems to transport system data.

7. Can gateway communications accommodate IP based (cellular or fiber) backhaul options?

   Yes, comply.

8. Is your system a push system or polling system? Does the system push data back to head end on every interval?

   TUNet is a near-real-time "push" system. Consumption and voltage data are pushed on the interval, alarms are pushed in real-time as events occur.

9. Does the system push alerts (such as outages) regardless of method used for meter reading?

   Comply. All readings and alerts are pushed up to the headend.

10. If a radio solution is proposed, does it use licensed and/or unlicensed frequency?

    The proposed solution uses only unlicensed spectrum and does not require any licensed spectrum.

11. If licensed frequency(ies) are proposed, what entity holds the license to the spectrum?

    Our TUNet proposal does not require licensed frequencies, and therefore this does not apply to our system design.

12. Is communications within the proposed network a mesh, point-to-multipoint, or another type?

    Tantalus's system is a hybrid design that combines the benefits of a point-to-multipoint system and a mesh system.

    Our networks have limited architecture and make direct connections from the endpoint to the network and are intentionally designed with fewer hops. As a result, our system can outperform a mesh but has the added benefits of a self-healing network, unlike a point-to-multipoint system.

13. What RF transmit power levels will be used at each network device including at the smart meters, gateways, etc.?

    TUNet modules typically transmit between 0.8-1.0 watt of power.

    TUNet gateways transmit at 1 watt of power.

    TUNet LAN repeaters transmit at 0.9 watts of power.

14. How often is billing and voltage data for each meter delivered to the head end?

    TUNet pushes all data, including billing data and voltage, from every TUNet electricity meter in near-real-time. Of course, alarms, exceptions including sag/swell and outage/restoral messages are also pushed with high priority to the headend.

15. Explain how LAN traffic is managed throughout the day and at times of peak volumes, and how

the network ensures that messages are not lost during outages in times of high traffic such as data polling.

TUNet's hierarchical network architecture is designed to support the highly efficient use of frequency hopping within the communication channel. The efficiency of channel usage is actually more important than the width of the channel. AMI and channel management take up less than 25% of the available TUNet LAN capacity. Leaving the remaining 75% to handle spontaneous messages such as outage, restoration, voltage alerts, and endpoint Alarms. That also leaves plenty of capacity available for "Beyond AMI" applications such as DNP3 messaging for Grid Optimization, Load Management with Measurement and Verification, Streetlight Control, to name a few.

The overall efficiency is realized through Tantalus' unique approach to channel management. TUNet constructs each channel as a vector set comprising a minimum of 50 frequencies per transmission, providing 64,000 individual vectored channels. Should a collision occur in the communication channel, redundant encoding across the other frequencies allows TUNet to reconstruct the missing data. This approach avoids the need to retransmit packets due to RF collisions. All "in-flight" messages are preserved in non-volatile memory and are not lost during network reconfiguration or outages.

Most other AMI systems also use frequency hopping but use just the minimum FCC required 25 frequencies and only provide a maximum of 200 channels for communication. Their extra available channel capacity is greatly limited with this approach.

Finally, TUNet monitors all expected data and if any holes are seen, TUNet has a feature called Transaction Retrieval (TXNR). This process will request any missing interval data, in the database, from the end point.

All outage messages are at the top of our priority messages and get through in the fastest possible manner. The TUNet system utilizes priority messaging to provide efficient use of the network and timely data. TUNet supports multiple levels of message priority with the highest level reserved for DA, followed by outages, then alarms. Interval data is delivered with the lowest priority. When meters generate high priority data, the data is immediately pushed to the gateway and on to the head-end. Outages are typically displayed in the head end in 1 minute or less.

During an outage, all messages are stored in RAM and are re-broadcast upon restoration of power.

16. What data is included in each outage message? e.g. kWh, voltage, etc.

    Each last gasp outage message contains, current consumption (dial) reading and the time stamp of when the outage condition began.

17. Does the proposed system utilize smaller LANs to reduce network congestion? What is the average number of endpoints per LAN in the quoted design?

    Tantalus designed TUNet to accommodate smaller LANs to ensure effective command and control communications. Smaller LANs are more efficient, and it may seem counter-intuitive, but they provide a more robust network. The frequency hopping channel management efficiency mentioned above is achieved partly through the support of smaller LAN sizes, which leads to processing fewer messages per controller, thus making command and control more robust and dependable. Using smaller LANs also allows TUNet field deployments to be

designed with fewer hops than most mesh-based AMI systems. This results in a more robust network with lower latency because meters rely on fewer devices to relay their messages to the head end. This is especially valuable in outage and restoration reporting.

18. If the quoted design uses a hierarchical or mesh network, what is the average number of hops expected to reach an endpoint in the system as quoted? What percentage of meters will be connected directly to an access point?

    Approximately 90% of the meters should connect directly to an access point. Another 8% of the meters should connect with 1 hop. All the meters should connect within 3 hops.

19. Does the system have redundant communication paths (i.e. "self-healing") in the event of loss of communication?

    TUNet LANs are self-initializing, self-healing and self-optimizing. Upon initial power-up, the meters find an optimal path to the TCC and several alternate paths which are stored in the TUNet communication module in the meter. If the primary path is not viable (loss of communication between the meter and the head-end), the meter will utilize one of its alternate paths to push data to the head-end. In the event the alternate path is unavailable, the meter will seek to continue to seek a path to the headend. In the meantime, it stores its data in non-volatile memory so no data is lost.

20. Are any readings collected from the ERT communication modules done under a license agreement?

    Yes, Tantalus has a detailed agreement in place with Itron to read their ERT technology and use of our technology does not void the Itron warranty.

Security

1. Do meters have the ability to authenticate valid requests and reject those initiated from unauthorized systems or devices?

   All meters have the ability to authenticate valid requests and reject those initiated from unauthorized systems or devices.

2. What method of signal security is provided (i.e., type of encryption)?

   TUNet LAN communications security utilizes AES, RSA, and SHA technologies and is further enhanced at the physical layer during the 2-dimension pseudo-random encoding of the data, this provides best-in-class anti interception and anti-jamming immunity. The technique, which is modeled after military applications, provides deep parallelism of communications and provides superior security with profound interception immunity. Security of remote access to the TUNet WAN infrastructure (backhaul) requires a valid SSH-2 (AES) encrypted tunnel. Please see Tantalus Security Framework Architecture document provided later in this proposal for further details on Tantalus' commitment and approach to complete system security.

3. What standards are followed relating system security?

   The TUNet system utilizes specific subcomponents of the following standards with respect to security, authentication and encryption;

   ANSI C12.18, 19, 21, Metering protocol standards.

   NERC CIP-005-1

   NERC CIP-007-1

   AES symmetrical encryption standard

   RSA asymmetrical encryption standard

   Secure Shell SSH-2

   TUNet makes particularly heavy use of Secure Shell SSH-2 with extended feature sets to form highly secure tunneled connections for user access complete with key management, authentication services and management of digital certificates etc. TUNet Network data transfer to the TUNet Control Center (TCC) is via TCP/IP, utilizing SSH (AES) using 1024-bit RSA keys and PKI for data security. Data is transferred from the meters to the TCC through, a 900 MHz Local Area Network (LAN) between meters, and a TCP/IP Internet Wide Area Network (WAN). The protocols used over the RF network are proprietary to Tantalus and include encryption and spread spectrum frequency hopping. TUNet web application access is handled via an Apache® Tomcat web server, providing access, authentication and security (SSL) to the TCC by an unlimited number of PC users running a standard web browser.

   Local access to WAN devices for the purpose of firmware upgrades is expressly disallowed. All WAN class upgrade activity is restricted to secure access via the TUNet Control Center. Upgrade images may be rolled back.

   TUNet LAN communications encryption is encoded at the physical layer during the 2-dimension spreading of the data. Updates to firmware or changes in parametric configuration to ANY component within the TUNet system can only be initiated from the TCC. Local access

to LAN endpoint devices for the purpose of firmware upgrades is expressly disallowed without authentications as prescribed within the ANSI C12.18 and C12.21 standards. The protocols used over the RF LAN network are proprietary to Tantalus and include encryption as described. Wireless communication between various endpoint devices uses a spread-spectrum 900 MHz approach with frequency-hopping algorithms that are equivalent to an encryption security key. An outside listener is not able to easily determine on which frequency at which time a transmitter will be on. The unique network identification assigned by Tantalus during manufacturing and registered with the TCC is required to communicate with individual devices. TUNet will not recognize any communication device that does not submit a valid endpoint ID. The WAN Transceivers must be manually associated in the TUNet network. The system will not communicate with unassociated units.

TUNet is connected to the utility's private corporate network and typically operated inside the utility's firewall. Any computer accessing TUNet will therefore adhere to all existing corporate IT practices before being given access to TUNet. TUNet web application access is handled via an Apache® Tomcat web server, providing access, authentication and security (SSL or TSL) to the TCC by a standard web browser. All web connections are automatically logged out after a period of unattended use.

TUNet provides a series of login IDs and passwords to give users role-based access to the network. Users from any department connected to the Intranet can access TUNet using any PC with a standard web browser, such as Microsoft Explorer. Users will be required to log into TUNet with a pre-assigned user ID and password.

The Tantalus TCC server is running Security-Enhanced Linux, which was designed by the NSA. The IP traffic interfaces are highly restricted and access of programs within the server is highly confined, so can conceptually be thought of as an internal firewall between programs. For every release, the system is scanned with industry-leading vulnerability analysis tools (e.g. Nessus) to ensure that we are addressing the most recently discovered vulnerabilities related to our software system.

4. Does turning on security in the AMI impact network performance (i.e. latency)?

   The ability to comply with the recommended security guidelines for AMI/Smart Grid is inherent in our solution. Security is provided via hardware and software at each layer of the system. The network performance will not be impacted by use of these security measures as the system was designed to incorporate these measures on all deployments.

5. How does the system protect the confidentiality of the utility and its members?

   TUNet provides a series of login IDs and passwords to give users role-based access to the network.

   The Tantalus TCC server is running Security-Enhanced Linux, which was designed by the NSA. The IP traffic interfaces are highly restricted and access to programs within the server is highly confined, so can conceptually be thought of as an internal firewall between programs. For every release, the system is scanned with industry-leading vulnerability analysis tools (e.g., Nessus) to ensure that we are addressing the most recently discovered vulnerabilities related to our software system.

Electric Meters

1. Is the meter a solid-state measurement device, with industrial grade electronic components?

   Yes.

2. What class accuracies are available for the electric meters proposed in the system?

   The Itron residential meters quoted meet the ANSI Class 0.5 accuracy standard. The C2S meter typically provides 0.3% accuracy.

   Itron Sentinel Meters quoted meet the ANSI class 0.2 accuracy standard.

3. Is the meter designed such that the AMI communication module can be replaced without affecting the metrology?

   Electric meter communication modules are field-replaceable without affecting metrology and calibration.

4. Is the calibration affected by changing the AMI communication module?

   No.

5. Does the meter have the capability to accumulate positive energy if inverted in the socket?

   Yes, comply.

6. Is the meter able to meter bi-directional energy?

   On the Sentinel meter, kWh Received and Net requires the bi-directional option. If the meter has this option, TUNet can report the Del, Rec & Net registers from the meter each interval.

7. Would meters have three registers (delivered, received and net) for net-use customers?

   Most of Tantalus's customers have leveraged the household meter's net metering functionality to track how much energy is flowing back onto the grid from solar installations. Net metering is supported on all meter types supported by TUNet. On the Sentinel (C&I meter) net metering can be purchased as an option, and net metering is included on the base model of all other meters. TUNet can report delivered and received energy registers, or net (delivered-received) if preferred.

8. Is the C&I meter capable of providing cumulative, previous interval, and present interval demand?

   Comply.

9. Does the C&I meter support interval data for both real and reactive power?

   Sentinel and kV2c meters are available in these forms and can be used where reactive energy is required. Sentinel requires measurement level 2 or higher. kV2c requires the K Softswitch.

10. Does C&I meter comply with the following measurement functionalities:

    a. Energy (KWh delivered, received, net; VAh delivered & received; VARh and VA lead/lag)?

       The C&I meter supports kWh delivered, received, net & unidirectional, kVAh delivered, kVARh delivered & received, and corresponding demands for each of

these, plus coincident demands. (On the Sentinel meter, kVAh or kVARh requires a level 2 or higher Sentinel meter; kVAh and kVARh in the same meter requires level 3 or higher, and kWh received requires the bi-directional option.)

b. Demand (Max VA, Instantaneous; Max VAR)?

Comply.

c. Volts?

Comply.

d. Amps?

Comply.

e. Power Factor?

Comply.

11. Can the system report manufacturer diagnostic codes or installed softswitches in the C&I meter?

Diagnostic log information is part of the PQM reports which are sent automatically to the head end several times a day. They can also be provided on-demand.

12. Does the system support remote disconnect and reconnect of residential electric meters with an integrated AMI module?

TUNet supports remote disconnect/reconnect of electric meters provisioned with an under-glass disconnect switch.

The disconnect/reconnect can be initiated from the TCC headend or from a third-party application such as a CIS, MDMS or prepayment application integrated to TUNet. (Additional licensing may apply for third-party initiation. No additional licensing is required for TCC head-end initiation.)

13. Can both single and polyphase electric meters be retrofitted with AMI communication modules?

Most GE/Aclara I-210+ meters and Itron Centron I (C1S) meters can be retrofitted with Tantalus modules by the utility or a meter service provider. Itron Centron II (C2S) meters can also be retrofitted but the work must be done by Itron.

Itron Sentinel meters manufactured since 2007 (version 5.02) can be retrofitted with TUNet modules. Most GE/Aclara kV2c meters manufactured since 2008 can also be retrofitted.

Water Meters

1. Which water meter manufacturer's modules can the AMI system read?

   Tantalus supports reading the Itron ERT MIU (60W, 100W), the Badger Orion MIU, and the Neptune R900 MIU, which collectively support many commonly used water meters. For example, the Itron 100W ERT compatibility details are provided in the appendix of this proposal.

2. Can the AMI system read Itron ERTs?

   Yes, and Tantalus is the only company licensed to read Itron ERTs. The ERT modules' 900MHz communication is intercepted by TUNet electric meters and/or TUNet infrastructure components, and the gathered data is relayed to the TUNet head-end.

   The TUNet system initially discovers the 100 Series ERT module in mobile mode and sends a reconfiguration message to move it into fixed network mode. The fixed network mode increases the transmit power but increases the time duration between transmissions.

3. Are the City's existing Itron ERTs (50W, 60W, 100W) powerful enough to reach the collection network?

   All of the water endpoints are believed to be 100W ERTs and are powerful enough to reach the collection network. If the case of a hard-to-reach water meter a low-cost repeater can be deployed.

4. Can the system transfer water reads to the AMI headend at least daily?

   Yes, for lower powered ERTs (50W, 60W) daily water consumption reads are transferred at least daily, and for the 100W ERT reads are transferred more frequently and with greater granularity, providing hourly interval consumption data.

5. Do water meters communicate with the AMI network, directly with the host, in the same manner as electric meters?

   TUNet-enabled devices (AMI modules in electricity meters, repeaters, and gateways) capture the water meter communication protocol messages and transmit the included data to the head end over the same AMI network used for electric meters.

6. Is the water endpoint (i.e., the water meter communication module) readable by the same AMI system used for communicating with the electric meters?

   Yes, water and electric metering data is all collected over the same network and displayed on the same head-end.

7. Does the water endpoint transmit in the 902 – 928MHz frequency range?

   Yes, this is the communication frequency range of the Itron ERT MIU.

8. Does the water endpoint require a license from the Federal Communications Commission (FCC)?

   Yes.

9. What is the estimated battery life of the water endpoint?

   The expected battery life of water communication (ERT) modules is 20 years. Tantalus is

proposing to read existing ERT modules, and this will not affect the unit's remaining battery life. The 20-year battery warranty will still be honored by Itron.

Itron's 100W+ ERT module sends a Low Battery warning when the battery is 90% exhausted. This warning is transmitted with every bubble-up. A report in the TUNet software will show all endpoints transmitting the low battery warning. On average two years will elapse between the first Low Battery warning and the end of battery life, allowing ample opportunity for ERT change-out to be accomplished.

Operations

1. What hardware, software, or services will be required to deploy your proposed system?

   Tantalus has included the necessary hardware, software, and services in our proposal. This includes a virtualized on-premise server, IP-based collectors and repeaters for the 900 MHz LAN, cellular modems in cases where fiber may not be available, electric meters with integrated TUNet communication modules, Itron ERT 100W communication modules, professional services for integration and project management, with optional installation services for the network infrastructure and electric meters.

   Additional optional items include a MDM and customer portal from UtiliSmart.

2. What is the expected deployment timeframe?

   Tantalus can support an aggressive deployment schedule with the appropriate technical resources, one that matches the Utilities internal resources and budget.

3. Prior to proceeding beyond the first phase of the AMI implementation, the City of Escanaba will require a system acceptance test. How will this test be performed?

   Please see the included sample SAT test in the Appendix.

4. Are additional or multiple support services available?

   Tantalus Support is available in both Standard and Premium levels. For this project we have proposed standard level support; Premium level support is available at an additional charge.

   Please see the Technical Support Agreement included in the Appendix for details of the features of each support level.

5. What maintenance is the utility responsible for and what maintenance falls under the maintenance contract?

   Tantalus offers two (2) levels of maintenance and support: Standard and Premium. Please see the attached TUNet Technical Support Plan Summary for additional details.

6. Can the solution be procured as a software as a service (SaaS) model?

   Partial comply. We offer a SAAS model on software, hosting, support and maintenance. We do not offer a SAAS model on hardware. Hardware would be purchased and owned by the utility.

7. If applicable, what services are covered under the SaaS subscription?

   We have proposed a standard pricing model but can discuss SaaS services and pricing in the future if desired.

Advanced Applications

1. Does the system support the ability for the utility to control additional electric field devices?

   Yes, comply. The DA Bridge Modem can be used to interface with any intelligent device using DNP3 protocol.

2. Does the system have the capability for distribution automation and control?

   TUNet supports distribution automation and control, please see the included "Advanced Applications" document for further information.

3. Does the system have the capability for conservation voltage reduction?

   TUNet supports conservation voltage reduction, branded Closed Loop Voltage reduction (CLVR), please see the included "Advanced Applications" document for further information.

4. Does the system have the capability for demand response and load management?

   TUNet supports demand response and load management, please see the included "Advanced Applications" document for further information.

5. Does the system have the capability for street light control or monitoring?

   TUNet supports streetlight control and monitoring, please see the included "Advanced Applications" document for further information.

6. Does the system have the capability for renewable energy integration and energy storage?

   TUNet supports renewable energy integration and storage, please see the included "Advanced Applications" document for further information.

Integration

1. What integration interface and communication standards is the system capable of?

   TUNet supports integration via flat file, MVRS/FCS, MultiSpeak 3, MultiSpeak 4.1, and DNP3.

   ### Communication standards

   Tantalus developed a 'hybrid' communications network that leverages the most effective and efficient communications options available in order to design the right solution for our utility customers. As we can deploy different options in each solution, we are able to take into consideration the specific requirements and geography/topology of the utility and deploy our flexible network as appropriate. That means we design the system just for you - and don't try to force any one particular architecture for every utility.

   TUNet can leverage different transport methods, including fiber, cellular, Wi-Fi, WiMAX and 220 MHz RF. Each transport method can be used individually throughout the service territory or in combination with others to provide the infrastructure best suited to your current and evolving needs.

   The TUNet system utilizes specific subcomponents of the following standards:

   ANSI C12.18, 19, 21,

   Metering protocol standards.

   NERC CIP-005-1

   NERC CIP-007-1

   AES symmetrical encryption standard

   RSA asymmetrical encryption standard

   Secure Shell SSH-2

   Additionally, the TRUScan application supports Itron ERT, Orion CE and Neptune communications protocols, which is unique in our industry.

2. Does the system support MultiSpeak interfaces?

   Tantalus has integrated using MultiSpeak to all the major software brands for utility systems.

   CIS - 3.0/4.1

   MDM - 3.0/4.1

   SCADA - 3.0

   OMS - 3.0/4.1

   DERMS/DR - 3.0/4.1

   EMS - 3.0/4.1

3. Does the system support ModBus?

Field devices using Modbus and other SCADA protocols can be supported using protocol converters to convert to/from DNP 3.0.

4. Does the system support DNP?

   TUNet supports DNP 3.0 directly.

5. Does the system interface and with third party application types such as:

   Today TUNet integrates with CIS, MDM, MDMS, Portals, GIS, OMS, MV-RS, SCADA, and several other types of 3rd party applications including prepay.

   a. MDM?

      Tantalus has worked with many MDM/customer engagement portal vendors and can integrate TUNet to the MDM vendor of your choice. TUNet has been integrated into the MDM vendors listed below via a variety of methods including MultiSpeak and flat files. Some of the preferred MDM providers we have integrated with include IPKeys/Electsolve, UtiliSmart, UtiltyHawk, Central Service Association (CSA), NISC, and Harris. These partners also offer residential and commercial portal applications. Tantalus is currently integrated with each above system at their current version. These can be provided upon request to the third party for more information.

   b. OMS?

      We interface with various outage management systems via MultiSpeak 3.0 or 4.1.

   c. GIS?

      TUNet supports exporting of data to ESRI utilizing a WFS Geoserver standard. In addition, TUNet provides a flat file interface as well.

      Integration to the ESRI GIS is supported but has not been included in the proposed solution.

      Many of our customers deploy AMI without a Graphical Information System (GIS), as TUNet Control Center (TCC) with TUNet Insight® has many of the features that GIS solutions offer.

      Ease of use is a hallmark of the TUNet Insight platform, and the capabilities of the TRUView® application are at the center of the intuitive interface. The Tantalus AMI system is displayed in a map format for ease of understanding, as an overlay to an open street map of the utility service territory.

      This graphical representation of the AMI network shows the near-real-time status of all TUNet network components and utility assets being read over the system. The communications linkages are displayed between Tantalus radios visually, so the user can see the network associations. Additionally, device read status and history is viewable as well as real-time outage information.

      A powerful tool often utilized on GIS platforms is the filtering of various layers of information to better understand network occurrences. The capability to filter layers is built into TRUView, allowing the utility to separate data on a specific classification.

For more information on how TUNet can replace the need for a Graphical Information System, we can gladly provide additional detail upon request.

d. CIS?

TUNet has been integrated into dozens of CIS systems - many of which do not support MultiSpeak. As we learn more about your CIS, we would be happy to provide a comparable reference.

e. SCADA?

ACS, OSI, and Survalent are the most common SCADA vendors we integrate with, having 10+ successful integrations with each. Some additional SCADA companies we have integrated with include:

- Schneider Power Monitoring

- Siemens

- Spectrum Engineering UMS

- Aveva/Wonderware

- CG Automation

- GE iFix

f. PrePay?

TUNet enables the utility to add pre-pay functionality at any time. TUNet can be integrated with prepayment applications from several vendors via MultiSpeak and flat files. TUNet has been integrated with several prepayment vendors including NISC, Exceleron, and PayGo.

Warranty

1. Does the Vendor's warranty encompass any 3rd party products required for the system?

   New Third-Party Products are warranted per the manufacturer. The Itron meter warranty is for 3 years.

2. What hardware is covered under warranty and what are its term lengths?
   Tantalus's standard warranty is 12 months from the date of shipment of each unit of Tantalus products as detailed in the attached Network Systems Agreement.

3. Is an extended warranty available?

   Warranty options are available to extend the warranty to 24 months or 36 months at an additional cost. Currently, Tantalus does not offer any warranty beyond 3 years.

Reporting

1. Does the system allow for both administrative and privilege-defined user accounts?

   TUNet head-end software provides role-based security for all authorized users - including read-only access and various levels of restricted access to certain features. Multiple roles can be assigned or removed for a given user account.

2. Does the system allow for custom GUI diagrams or overlays?

   Utilizing TRUView the utility can obtain a graphical representation of the system. The Monitor Menu in the TUNet GUI allows you to drill down to the Event Monitor, WAN Collector Monitor, LAN Device Monitor, Meter Monitor, LM Device Monitor, and ERT Device Monitor. The individual monitors provide data on communication status, signal quality, association, and events such as outages, swells and sags, and tamper.

3. Can the system define groups of specific endpoints for custom reporting rules or alarms/events?

   Yes. An on-request read can be sent to individual meters or groups of meters (using Contextual Addressing) to provide power status. Using Contextual Addressing, the Network Server allows groupings of devices. TUNet data and TUNet Contextual Addressing information can be incorporated and implemented in high-level application-specific, decision support tools such as SCADA, GIS, IVR, OMS, etc. to provide enhancements in data management or drive the control of a variety of distribution devices including capacitor banks, disconnect switches, load management switches, etc. Contextual Addressing is an innovative and powerful sorting tool provided by TUNet which allows the utility to sort and search based upon a number of utility-defined criteria and supports distributed command and control of intelligent devices. Meters can be grouped by substation and feeder for polling as required. It allows employees of the utility to write powerful system queries without previous software training or dedicated software resources/time. It provides the utility with the ability to define and report the grouping of customers as they choose. For instance, it may be desirable to group customers by billing cycle, and also by meter route, feeder, or transformer, etc.

4. Can report data be exported in commonly used formats for use in other systems?

   Currently TUNet supports data export including CSV and HTML for use by other systems.

5. Do reporting tools give access to networking status and communication performance?

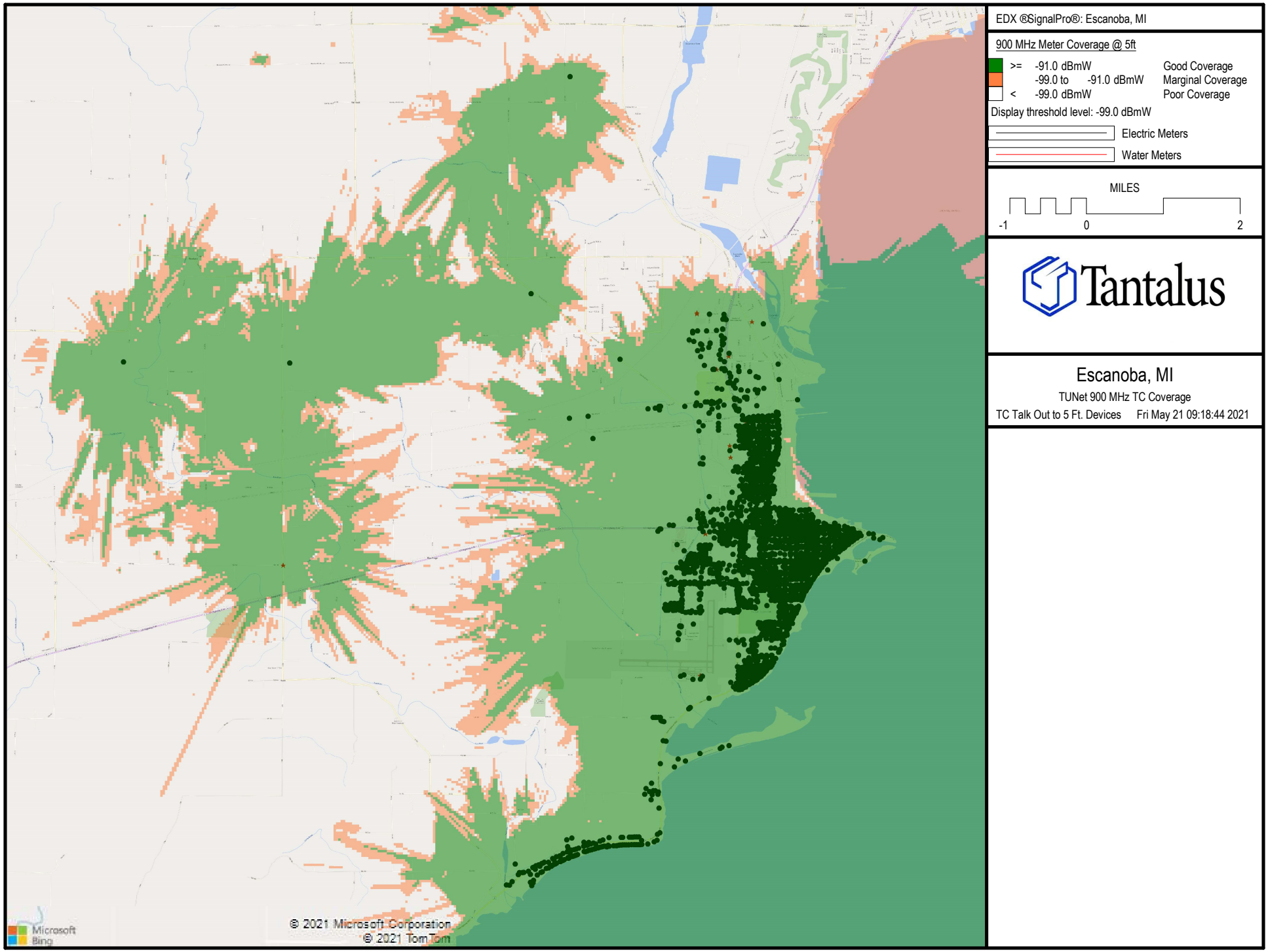
   TUNet provides robust reporting capabilities. The TUNet User Interface (UI) includes many diagnostic and troubleshooting reports. System Dashboards provide read reliability reports, active event logs, the status of networking equipment, and performance. TRUView displays real-time events and system performance data in graphical format.

   The Monitor screen provides the ability to access network data and reports associated with managing active events such as outages and tampers as well as communication status of the LAN and WAN.

6. Can reporting be accessed via the internet from outside the LAN or immediate WAN?

   Yes, TUNet is a web-enabled platform, and reports can be accessed via an internet connected device with a compatible web browser and appropriate login credentials.

Propagation Study



EDX ®SignalPro®: Escanoba, MI

900 MHz Meter Coverage @ 5ft

>=	-91.0 dBmW		Good Coverage
	-99.0 to	-91.0 dBmW	Marginal Coverage
<	-99.0 dBmW		Poor Coverage

Display threshold level: -99.0 dBmW

Electric Meters

Water Meters

MILES

-1 0 2

Tantalus

Escanoba, MI

TUNet 900 MHz TC Coverage

TC Talk Out to 5 Ft. Devices Fri May 21 09:18:44 2021

Detailed Pricing

Tantalus

City of Escanaba MI
Tantalus Proposal - ERT Overlay Deployment

TUNet Equipment and Services	Full Deployment		
TUNet WAN/LAN Equipment	**Quantity**	**Unit Price**	**Ext. Price**
VC-934 Versa Collector	6	$ 3,400.00	$ 20,400.00
VC-820 Cellular Modem	6	$ 975.00	$ 5,850.00
TR-1901 Pole Mounted 900MHz LAN Repeater	5	$ 289.00	$ 1,445.00
DT-116 Centron Reset Key	1	$ 32.85	$ 32.85
DT-420-BUN-VM Programming Kit	1	$ 1,530.00	$ 1,530.00
TUNet Infrastructure Sub Total			**$ 29,257.85**
TUNet Endpoint			
TC-1216 Tantalus Single Phase Module - Itron	3295	$ 55.00	$ 181,225.00
TC-1220RD Tantalus Single Phase Remote Disconnect Module - Itron	240	$ 60.00	$ 14,400.00
PP-1316 Tantalus Poly Phase Module - Itron Sentinel	41	$ 160.00	$ 6,560.00
Endpoint and Meter Sub Total			**$ 202,185.00**
TUNet Server & Software - Hosted Solution			
VSL-200 TUNet Control Center Software Virtualization License	1	$ -	$ -
TCC-2005 TUNet Control Center Head End Software	1	$ 40,000.00	$ 40,000.00
NSE-201 TUNet Software License - per Endpoint	3,576	$ 3.50	$ 12,516.00
PPA-100 Polyphase Software - per Endpoint (100 endpoint license)	1	$ 1,200.00	$ 1,200.00
TAL-400-1 TUNet Application - Electric ERT Reading	3,700	$ 2.00	$ 7,400.00
TAL-410-1 TUNet Application - Water ERT Reading	6,445	$ 2.00	$ 12,890.00
NSE-303 TUNet Software License - Multispeak 4.1 Remote Disconnect	-	$ 20,000.00	$ -
NSI-302 TUNet Software License - Multispeak 4.1 Outage Filter	-	$ 20,000.00	$ -
TAL-530-1 TUNet Application License - Residential Peak Demand	-	$ 9,000.00	$ -
NSI-306 TUNet TRUView GIS Admin License - ESRI Integration	-	$ 10,000.00	$ -
NSI-304 TUNet Software License - Multispeak 4.1 MDM/CIS Interface	-	$ 25,000.00	$ -
Total Server and Software Price			**$ 74,006.00**
TUNet System Services - Assumes 12 Month Pilot Deployment			
SV-1000 Deployment Services -Project engineering, training, project mgt, system design, deployment prep -Server and base station configuration, set up, and commissioning. -Database set up, billing integration. -Travel and Travel Expenses included.	1	$ 51,480.00	$ 51,480.00
TUNet System Services Sub Total			**$ 51,480.00**
TUNet Equipment and Services Grand Total			**$ 356,928.85**

Itron Meters	Quantity	Unit Price	Ext. Price
Itron C2SXD 2S CL200 240V w/ Disconnect w/ Tantalus Installed	240	$95.00	$22,800.00
Itron C1SX 2S CL200 240V w/ Tantalus Installed	3295	$35.00	$115,325.00
Itron C1SX 2S CL320 240V w/ Tantalus Installed	0	$0.00	$0.00
Itron C1SX 2S CL320 480V w/ Tantalus Installed	0	$0.00	$0.00
Itron C1SX 3S w/ Tantalus Installed	0	$0.00	$0.00
Itron C1SX 4S w/ Tantalus Installed	0	$0.00	$0.00
Itron Sentinel L1 9S CL20 w/ Tantalus Installed	41	$215.00	$8,815.00
Itron Sentinel L1 16S CL320 w/ Tantalus Installed	0	$0.00	$0.00
Itron Meter Grand Total			**$146,940.00**

Water ERTS	Quantity	Unit Price	Ext. Price
Itron 100W+ Water Module - Pit ERW-1300-402 or Remote ERW-1300-313	3125	$78.50	$245,312.50
Itron 100W+ Pit Through Lid Mount Kit (Quantity TBD)	0	$3.00	$0.00
Itron 100W+ Mounting Kit for Remote Installations (Quantity TBD)	0	$3.00	$0.00
Itron Meter Grand Total			**$245,312.50**

Tantalus Project Grand Total	**$ 749,181.35**

OPTION - Turnkey Project - Electric Meter and Infrastructure (Collector and Repeater) Installation			
Install - Infrastructure (Repeaters and Collectors)	1	$ 7,900.00	$ 7,900.00
Turnkey Deployment Services - Infrastructure	1	$ 4,160.00	$ 4,160.00
Electric Meter Install	1	$ 68,491.13	$ 68,491.13
Water Meter Register Upgrades - Based on meters up to 1"	1	$ 132,968.75	$ 132,968.75
Turnkey Deployment Services - Meter Install	1	$ 12,000.00	$ 12,000.00
Mobilization	1	$ 3,680.00	$ 3,680.00
OPTION Grand Total - TUNet System Install			**$ 229,199.88**

OPTION - MDM - Please see attached pricing pages.	
OPTION Grand Total - MDM	**$ -**

TUNet System Annual Support & Maintenance				
TUNet Annual Maintenance	1	$ 12,946.00	$	12,946.00
SL-2001 TUNet Technical Support - Standard	1	$ 9,560.00	$	9,560.00
TUNet System Annual Support & Maintenance			**$**	**22,506.00**

Pricing Notes & Assumptions:

Prices are in US Dollars and are exclusive of taxes, duties, freight, or insurance.
Price does not include shipping. All products are shipped FOB Origin.
Tantalus service time billed on milestones. If additional days are necessary, customer will be billed at the rate of $1,500 per day.
Tantalus' pricing and technical responses are subject to du diligence, finalization of work scope, project schedule and negotiation of mutually acceptable terms and conditions.
We are willing to discuss all resonable alternatives.
If ERT's a represent, quote assumes all ERT's are R300, 60, 80, or 100 series devices. If they are not, additional costs may be incurred.
Our offer is based on the Tantalus Network Systems Agreement.
This quotation may contain allowances, discounts and / or promotional pricing. Prices quoted are valid for 30 days from the date of this quote.
Additional equipment purchases and services shall be invoiced at Tantalus's then current List Price unless parties agree to alternative pricing.
With the exception of meters, modules, and ERTS shipped by Itron, prices do not include shipping. All products are shipped FOB Origin. Other arrangements can be made at additional cost.
Tantalus Standard Terms and Conditions apply.
Annual System Support is available in both Premium and Standard Level.
Meter pricing assumes the utility will purchase meters with integrated TUNet modules directly from the Itron distributor/representative.
Support and Maintenance prices subject to increase as more applications are added in the future.
Service time does not include installation of meters, collectors, repeaters, or other infrastructure equipment.
Tantalus' network is designed to provide full connectivity and is based on customer supplied site location data. To allow for variances in data accuracy or completeness, Tantalus provides a Network Design Reserve of 10% for this project. If during deployment it is determined additional network equipment is required, the Reserve shall cover the cost of such equipment. This cost is not billed to the client unless used. Any additional equipment required beyond the Reserve will be furnished by Tantalus at its expense.

Final performance criteria is contingent upon installation of equipment and deployment of TUNet per the final AMI network design and in accordance with Tantalus' specifications. Regardless of the party performing the installation, it is the responsibility of the Utility to provide utility specific information that may have an impact on the final design and/or performance criteria (i.e. location, conditions of water pits and type of pit lids, etc.) prior to contractual commitment to ensure that all equipment is installed in a manner that mitigates communication issues.

Not included:
3rd Party Installation of meters, collectors, repeaters, and tower rigging. Meter install is available for an additional charge.
220 Mhz License Fees.
Shelters for base stations.

GENERAL PRICING NOTES

- The pricing provided is limited to the equipment, software and services as proposed in this offer. Changes to quantities, deal structure or third-party partners that are part of this proposal may change the prices contained in this offer.
- Prices quoted for Tantalus's Network Equipment and Services may contain allowances, discounts and/or promotional pricing which are available for a period of 180 days from the date of bid opening.
- Design Reserve:
    - Tantalus' network is designed to provide full connectivity and is based on Customer supplied site location data. A detailed TUNet system design, Statement of Work and associated project plan ("Final Network Design and Plan") will be developed by Tantalus, in consultation with the Customer and applicable third parties, as required, during the contracting phase. To allow for variances in data accuracy or completeness Tantalus provides a Network Design Reserve. In the event additional collectors or repeaters are deemed necessary and required to meet a coverage commitment (as defined and agreed to in the final contract), Tantalus will provide such additional collectors and/or repeaters to the Customer at no additional expense to the Customer. The Network Design Reserve for Customer is: $_____
- Final performance criteria and any associated guarantees will be included in the final contract and are contingent upon installation of equipment and deployment of TUNet per the final AMI network design and in accordance with Tantalus' specifications. Regardless of the party performing the installation, it is the responsibility of the Utility to provide utility specific information that may have an impact on the final design and/or performance criteria (i.e. location, conditions of water pits and type of pit lids, etc.) prior to contractual commitment to ensure that all equipment is installed in a manner that mitigates communication issues.
- The standard warranty terms and conditions set forth in Tantalus's Network Systems Agreement (NSA) apply unless otherwise expressly agreed to by Tantalus in the final contract. Tantalus offers an optional Extended Warranty of up to a total of three (3) years for an additional cost.
- Acceptance terms shall be discussed, mutually agreed to and set forth in the final contract, including without limitation those terms associated with acceptance of shipments for invoicing purposes and system acceptance relative to each phase of the project.
- Final commitments shall be exclusive of failures resulting from the acts, omissions or performance of systems, services or networks provided by third parties or not otherwise within the control of Tantalus; and contingent upon the Customer's taking commercially reasonable actions in connection with maintaining the TUNet system, including, without limitation, entering into and complying with the terms of End User License Agreement and Technical Support contained in Tantalus's NSA.
- Annual System Support is available in both Premium and Standard Level (as quoted). Premium pricing is an additional $15,000.00 annually. The Customer may elect to receive Premium Level support features, subject to up-front payment in full of the Premium Maintenance and Support Adder ($15,000.00) at the time of such election.

- Meters are Third-Party Products. Unless otherwise specifically set forth in writing (and subject to applicable pass through terms and conditions), Tantalus does not provide a guaranty or warranty of any type or manner with respect to Third-party Products, Third-party Services and/or Third-party Software (as defined in the NSA) and disclaims all responsibility and liability for these items.
- Pricing includes all of work, if any component is split, Tantalus reserves the right to reprice. Additional or incremental functionalities are subject to additional fees.
- A minimum lead time of 90 days is required on all Purchase Orders.
- Notwithstanding anything to the contrary in the Customer's RFP or Tantalus's response thereto, Tantalus's Response, including the pricing provided, is based upon its Network Systems Agreement (as attached) and the absence of a specific response or annotation by Tantalus to any of the specifications, the Customer's requirements or terms and conditions in the RFP does not otherwise limit Tantalus's ability and right to negotiate such details during contract negotiations.
- [The cost of any bonds shall be the sole responsibility of the Customer and the cost thereof shall be finalized based on the final project structure as agreed during contracting.]
- Integration to existing vendor supported interfaces are included in the Deployment Services – To the extent Customer requests custom services, including custom integration(s) between TUNet and third party applications that are not existing vendor supported interfaces are not included in the Deployment Services and are subject to additional fees and agreement between Tantalus, Customer and any applicable third party in the form of a written Change Order.
- "Deployment Services" means Tantalus's project management services, network setup, system integration, training and field engineering support services provided during the Project Setup and Project Deployment Stages Deployment services includes travel and expenses based on the Customer specific bill of material at the time of contracting. Changes to the Customer's bill of material that require an increased number of onsite visits by Tantalus support personnel, in Tantalus' discretion, are subject to additional fees. Integration to existing vendor supported interfaces are included in the Initial Deployment Services. To the extent Customer requests custom services, including integration(s) between TUNet and third-party applications that are not existing vendor supported interfaces, such customer services are subject to additional fees and agreement between Tantalus, Customer and any applicable third party in writing.
- Tantalus shall invoice the Customer and the Customer shall remit payment to Tantalus for the SV-1000 Deployment Service fees associated with each phase of the project pursuant to the following Milestone schedule:
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#	Milestones	Percentage of SV-1000 Due
1	Project Setup/kickoff	15.00%
2	TCC (HES) Installed	10.00%
3	System Design Complete	10.00%
4	Initial Training Session	10.00%
5	System Integration	15.00%
6	Equipment Deployment	10.00%
7	Second Training	10.00%
8	SAT	15.00%
9	Project Complete	5.00%

- Annual System Support is available in both Premium and Standard Levels. The Customer may elect to receive Premium Level support features during the Alpha POC deployment phase, subject to up-front payment in full of the Premium Maintenance and Support Adder ($15,000.00) at the time of such election.
- Adding additional features and functionality such as NSI, PPX, DA and TAL options will increase Ongoing System Costs/SM-5000" by 22% of added feature/functionality.
- Optional Equipment/Services may be subject to additional terms and conditions, including without limitation those related to use of the software.
- [Markup added to installation and third-party electric meters purchased through Tantalus. Customer would realize cost savings by contracting directly with third party providers.]
- Tantalus does not guarantee pricing of Third-Party AMI Meters, which are quoted pursuant to and subject to the respective third-party meter manufacturer's terms and conditions (including warranty). Notwithstanding anything to the contrary and unless otherwise expressly and mutually agreed to in writing (including applicable pass through terms and conditions) between the Customer, Tantalus and the third-party manufacturer, the third-party terms and conditions shall govern and control over all purchases involving Third-Party Products, Services and Software.
- Third-Party AMI Meter pricing and any related quantity and price validity terms set forth herein have been provided by the third-party manufacturer, in its sole discretion.
- [Water Meters encoder registers, connectors, RF endpoint and thru the lid antenna pricing is estimated AND NOT INCLUDED IN TOTAL COST.]
- Changes to the phased approach, including without limitation, the scope, budget, associated pricing and timing shall be discussed between the parties and set forth in a mutually agreed written Change Order.
- [Estimated Taxes are included at the request of the Customer. Tantalus does not invoice for taxes and does not make any representations regarding the accuracy of the same.]

Escanaba (Wesco) CONFIDENTIAL INFORMATION **Valid until September 08, 2021**

Electric Meters	7,235
Water Meters	6,445
Total Meters	13680

FEES SCHEDULE

UTILISMART BASE MDMS: UTILITY DATA MANAGER, UTILITY DEVICE MANAGER AND HEALTHMAP

ONE-TIME IMPLEMENTATION FEES

Item	One-Time Implementation Fees	
Utilismart MDMS Setup: Utility Data Manager, Utility Device Manager and HealthMAP	$ 27,500.00	**Note**
Utilismart MDMS to AMI Integration: Tantalus AMI Headend (CMEP, last gaps messages)	$ 8,800.00	
Utilismart MDMS to CIS Integration: billing reads (CSV file), meter synchronization (uSync CSV file or MultiSpeak), on/off register reads (CSV file)	$ 16,500.00	
Utilismart MDMS (HealthMAP) to GIS Integration: meter to transformer relationship, meter attributes (Excel workbook)	$ 11,000.00	
Total One-Time Fees	**$ 63,800.00**	

ANNUAL RECURRING FEES

Item	Annual Fees	Additional Fees
Utilismart Base MDMS: Utility Data Manager, Utility Device Manager, HealthMAP	$ 60,245.99	Meter over 13,680 will be billed $4.26 per year
Total Annual Recurring Fees	**$ 60,245.99**	

FEES SCHEDULE

UTILISMART OPTIONAL MDMS MODULES: SmartMAP, Residential Energy Manager, C&I Energy Manager

ONE-TIME IMPLEMENTATION FEES (optional services)

Item	One-Time Implementation Fees	Note
SmartMAP Setup (Outage Management, Grid Visualization, Engineering Analysis)	$ 27,500.00	
SmartMAP to GIS Integration	$ 16,500.00	
SmartMAP to SCADA Integration	$ 11,000.00	
Residential Energy Manager	$ 16,500.00	
C&I Energy Manager	$ 3,300.00	Assumes the setup of 100 C&I meters

ANNUAL RECURRING FEES (optional services)

Item	Annual Fees	Additional Fees
SmartMAP	$ 38,845.62	Electric meters over 7,235 will be billed $3.96 per year
Residential Energy Manager	$ 22,778.80	Meters over 13,680 will be billed $0.66 per year
C&I Energy Manager	$ 18,150.00	Service fee includes 100 C&I meters

United Systems
AMR / AMI | SOFTWARE | WATER LOSS

Itron

Quotation

For:
Escanaba, MI – AMI RFP
Tantalus, Chris Christensen
E: cchristensen@tantalus.com

Prepared By:
Brad Bersch, United Systems & Software, Inc.
P.O. Box 547 – 205 Ash Street, Benton, KY 42025
Phone: 262.328.7291 - Email: bradb@united-systems.com

Date	PO Number	Shipping Method	Shipping Terms	Delivery Date
May 25, 2021	TBD	Best Way	**Shipping Not Included**	~30-60 Days

Qty	Item # - Description	Unit Price - $	Line Total - $
Itron-			
~3125	Itron 100W+ Water Module- PIT- ERW-1300-402	78.50	TBD
~3125	Itron 100W+ Pit Through Lid Mount Kit	3.00	TBD
~3125	Itron 100W+ Water Module- REMOTE- ERW-1300-313	78.50	TBD
~3125	Itron 100W+ Mounting Kit for Remote Installations	3.00	TBD
Kamstrup-			
TBD	Kamstrup FlowIQ- 5/8x3/4 or 5/8x1/2 Composite-5' cable with bare wires- REMOTE	111.00	TBD
TBD	Kamstrup FlowIQ- 5/8x3/4 or 5/8x1/2 Composite-5' cable with Itron Connector- PIT	128.00	TBD
TBD	Kamstrup FlowIQ- 1" T-(10.75" lay) Stainless-5' cable with bare wires- REMOTE	243.00	TBD
TBD	Kamstrup FlowIQ- 1" T-(10.75" lay) Stainless-5' cable with Itron Connector- PIT	260.00	TBD
TBD	Kamstrup FlowIQ- 1.5" F-(13" lay) Stainless-5' cable with bare wires- REMOTE	481.00	TBD
TBD	Kamstrup FlowIQ- 1.5" F-(13" lay) Stainless-5' cable with Itron Connector- PIT	498.00	TBD
TBD	Kamstrup FlowIQ- 2" F-(17" lay) Stainless-5' cable with bare wires- REMOTE	638.00	TBD
TBD	Kamstrup FlowIQ- 2" F-(17" lay) Stainless-5' cable with Itron Connector- PIT	655.00	TBD
Optional-			
TBD	Itron 5' cable with Splice Kit (Waterproof pit splices)	15.00	TBD
TBD	Professional Services (Remote Training Services) *	$175.00/hour	TBD
	*If On-site, ADD $750 Trip fee & $250/day per diem		

General— Unless specifically stated to the contrary, prices do not include shipping and/or sales tax, if applicable. Likewise, this quotation does not include technical services related to setup, installation & configuration of proposed items unless specifically stated above. All related invoices shall be paid on a Net 30 Day basis. This quotation shall remain firm for ninety (90) days from the quotation date, unless modified in writing by USS prior to USS acceptance.
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TUNet Overview

The following 900MHz system design overview provides a technical description, functional and performance features, advantages and benefits of the proposed TUNet system.

TUNet General Overview

The Tantalus Utility Network (TUNet®) solution is a robust, multi-purpose platform purpose-built for municipal and cooperative utilities that provides data to power advanced smart grid applications. TUNet enables utilities to control costs, improve reliability, enhance customer satisfaction and manage energy and resources more intelligently. As decisions are made to add advanced functionality, Tantalus' single platform can support those requirements through its advanced, unique, and patented communications methods and its ease of scalability.

TUNet's data delivery method is unique in the industry and provides significant benefits to our customers. The network utilizes a predominantly push method (TRUPUSH™) for data delivery which enables the meters to deliver interval data as frequently as every five minutes for electric meters. Alerts and outages are pushed from the meters in near real-time. With TRUPUSH technology, data arrives sooner and will remain fresher than data provided by in a batched method three or four times a day. Because of this, not only can utilities react faster to the incoming information, but with the analytical tools available they can preempt many situations thus mitigating the negative impacts.

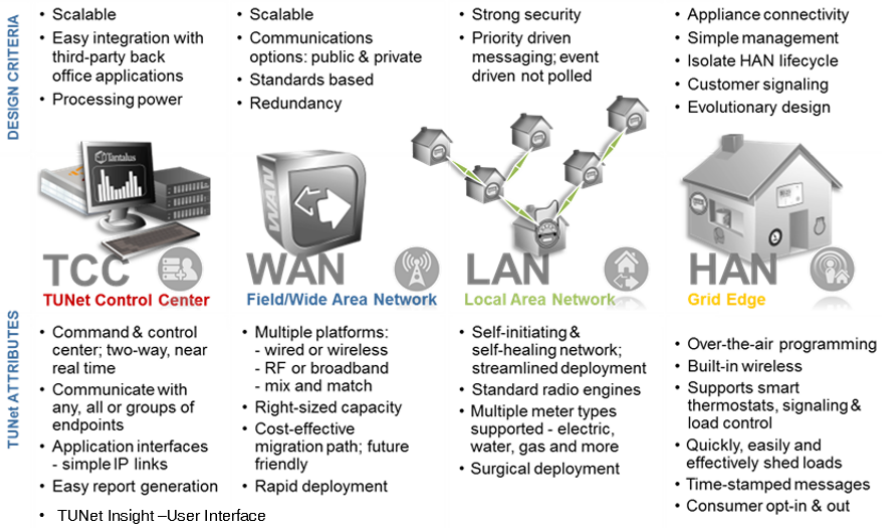
TUNet Control Center (TCC)

The heart of the data collection system is the TUNet Insight User Interface. This interface:

- Provides an intuitive visualization of the system and the AMI functionality,
- Manages and monitors the network,
- Displays meter interval data, alarms, and events,
- Provides a platform for 3rd-party applications over TUNet,
- The web-based interface provides easy access to a wealth of data and functionality that will facilitate customer service and improve operational efficiency.

TCC can be deployed as a virtualized or hosted solution that is purpose-built for municipal and cooperative utilities and can scale in a cost-effective manner.

The TCC accumulates and processes the data that has been pushed from the LAN (e.g. meter read data, DA devices, events, alerts) in near real-time. The server provides the central database and is designed to collect and accommodate large amounts of data. The data is stored in the TCC for up to 14 months and can be exported to other systems for longer retention time.



TUNet Insight

Tantalus is excited to be releasing a redesigned user interface with an updated look and feel and improved user efficiencies. Working with a design consultant and feedback from current customers, our new interface is more user-centric - providing more content at a glance with a configurable, intuitive design. Reports and analytics are easily accessible and the user interface is supported on smartphones and tablets allowing authorized employees secure access on-the-go.

Starting with a deep understanding of the tasks to be accomplished and the typical workflow for utilities, the interface facilitates maximum productivity. As an example, the initial screen differs depending on the user login credentials. A System Administrator will be taken to one landing page while a Customer Service Representative (CSR) will be taken to a different landing page. Because the Administrator and CSR perform different tasks, the information they need is very different. We have eliminated the frustration of having to click and drill down endlessly to get to where you need to start. The CSR landing page is user-configurable and supports robust search capabilities to help retrieve data quickly and better serve customers.

The intuitive interface lays out a clear path for users to get what they need - quickly. In just three clicks, users can drill down from strategic macro displays to tactical component views. This ease of use reduces the learning curve and improves productivity for users at all levels of the organization.

The dashboards provide a wealth of information at a glance. Users can evaluate the entire system and easily pinpoint and address critical issues. Balancing the format of the data content with a combination of tables, text, and graphics improves comprehension. The TUNet GUI provides a variety of methods for next actions (slide-out menus, drop-down boxes, expanding widgets) which makes an enormous amount of information instantly accessible without cluttering the screen.

Additionally, TUNet Insight screen-shots have been included in a separate document in the appendix located at the end of this proposal.

Data

All data, including outage notifications and sags/swells, provide a timestamp and full-scale register read, and are pushed to the TCC in near-real-time.

TUNet's data delivery method is unique in the industry and provides significant benefits to our customers. The network utilizes an endpoint push technology (TRUPUSH™) for data delivery which enables the system to deliver interval data as frequently as every five minutes for electric meters. Alerts and outages are pushed in near-real-time. With TRUPUSH technology, your data will get to you sooner and remain fresher than data provided by other vendors who provide batched data polled three or four times a day. Because of receiving more granular data when you need it, not only can you react faster to the incoming information but with the analytical tools available, you can preempt many situations thus avoiding the negative impacts. The TUNet TRUPUSH design also enables utilities to provide consumers with more detailed and timely consumption data as well as alerts, such as outages and water leaks (when coupled with ERT technology).

The TUNet module enables advanced monitoring capabilities including:

- Peak demand reset on request, by schedule, or by custom date and time as commanded by the TUNet Control Center.
- At peak demand reset, provides coincident and non-coincident peak kW and kVAR as calculated by the Sentinel meter.
- kW, kVAR, and kVA intervals for trending and profiling purposes.
- Instantaneous per phase voltage upon request or by interval.

- Upon request: coincident values to the peaks (kW / kVA / kVAR) if configured in the meter, cumulative kWh, kVAh, kVARh, and current values for non-coincident peak kW, kVAR, and kVA.
- Power quality information including current and voltage, line frequency, and power factor.
- Voltage monitoring: remotely configurable in the Tantalus module, real-time sags, swells, and outage alerts per phase.
- Load limiting/service limiting support

Network Analysis and Troubleshooting

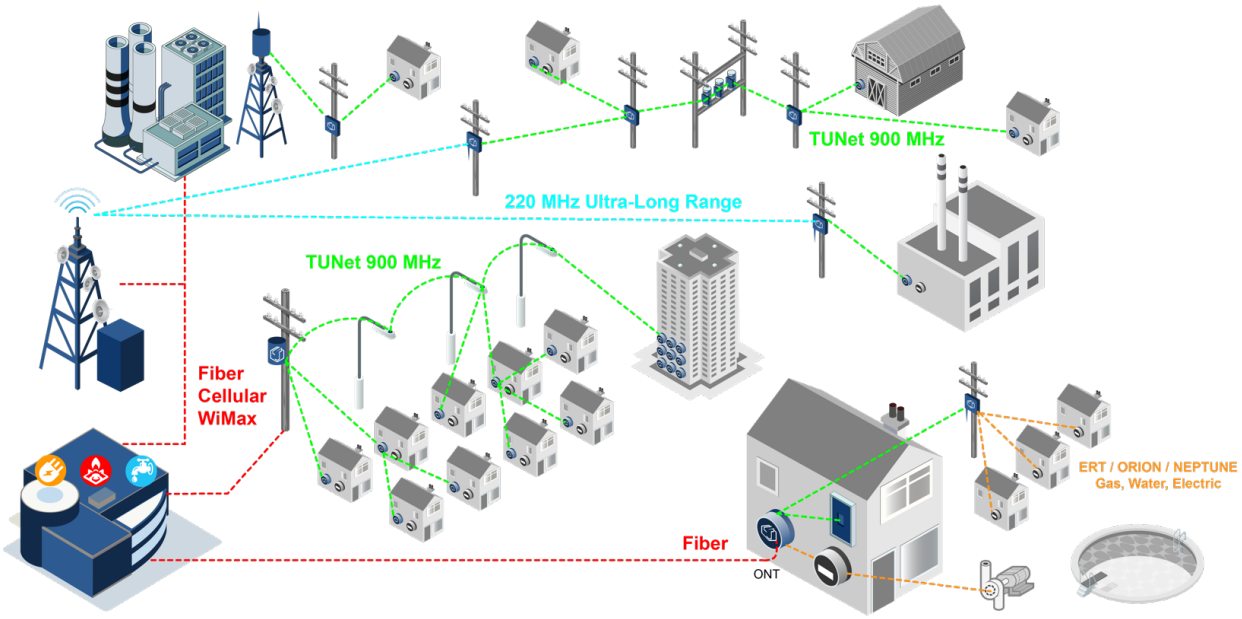
TUNet Insight, the graphical user interface, includes many diagnostic and troubleshooting capabilities.

- System Dashboards provide read reliability reports, active event logs, the status of networking equipment and performance.
- TRUView is a geolocation GIS tool that displays real-time events and system performance data in graphical format.
- The Monitor screen provides the ability to access network data and reports associated with managing active events such as outages and tampers as well as the communication status of the LAN and WAN.
- TUNet Insight provides the Status snapshot as a landing screen. It includes network and system statistics such as meter read rate and communication infrastructure health.

TUNet Network Components

900MHz Network Design

The image below provides an overview of what a deployment a 900MHz network will look like, including VersaComms (VC) Gateways, repeaters and 900Mhz communication with electric endpoints.



Wide Area Network (WAN)

TUNet can leverage multiple transport methods for the WAN/backhaul infrastructure including cellular, fiber, Wi-Fi, WiMAX, and others. Each transport method can be used individually throughout the service territory or in combination with others to provide the infrastructure best suited to current and evolving needs.

The VersaComms (VC) Gateway is a device that supports communication between the local area network (LAN) and the WAN. Tantalus offers a variety of Gateways to provide coverage for all types of deployments and terrain, while limiting the risks associated with a single point of failure.

The VC Gateway is aptly named as it is versatile in both the backhaul that it supports and its scalability in field deployments. The VC Gateway can be mounted at any convenient location where sufficient power is available, such as on the side of a building or at the top of a street pole and is available in several capacity sizes for cost-effectiveness. The VC Gateway enables connection to fiber, cellular and/or other IP-based communication backhaul platforms.

Local Area Network (LAN)

The local area network provides communication among the endpoints (electric, gas and water meters, DR/DA devices, future streetlight controllers) utilizing a 900 MHz RF technology in the unlicensed band. It is self-initializing, self-healing and self-optimizing. A key differentiator between TUNet and other 900 MHz LANs is that the data is pushed from the endpoints to the VC Gateways via TRUPUSH™ technology.

Routers – TUNet routers extend the reach of the LAN to provide connectivity between the VC Gateway and the harder to reach meters at the edge of the LAN. In addition, the module in every TUNet device acts as a repeater extending LAN coverage if needed and providing economical coverage in more rural deployments, as well as providing redundancy for the network.

Tantalus designed TUNet to accommodate smaller LANs to ensure effective command and control communications. Smaller LANs are more efficient, and it may seem counter-intuitive, but they provide a more robust network. The frequency hopping channel management efficiency is achieved partly through the support of smaller LAN sizes, which leads to processing fewer messages per controller, thus making command and control more robust and dependable. Using smaller LANs also allows TUNet field deployments to be designed with fewer hops than most mesh-based AMI systems. This results in a more robust network with lower latency because meters rely on fewer devices to relay their messages to the head end. This is especially valuable in outage and restoration reporting. Intelligent network routing and self-healing ensure the fewest hops possible without sacrificing the quality of the links.

Other AMI systems have thousands of meters communicating through a single data collection point controller. These systems also utilize polling to bring back meter data, with a large number of meters pouring data into one collection point controller. This bottleneck makes it difficult for high priority messages to get through. This inefficient use of network capacity means there is either limited capacity to support basic AMI such as remote disconnect, outage and alarms, or additional infrastructure is needed to ensure support. This limits the ability to add applications beyond AMI.

TUNet limits each LAN to a max of 250 TUNet endpoints. But fewer endpoints per LAN doesn't mean more infrastructure devices, more installation work, or a higher infrastructure cost per endpoint. Up to four LAN controller gateways can be co-located in one enclosure, providing a cost-effective high capacity device without sacrificing the benefits of smaller LANs. As an example, the TUNet VersaComms Gateway can support up to 1,000 endpoints in a single battery backed-up pole-mounted unit with up to four LANs. For ease of deployment and maintenance, LAN controllers can also be meter socket-based.

The scalability of the TUNet VersaComms Gateway allows for a more cost-effective infrastructure deployment in low-density areas. Why pay for an access point that supports many thousands of meters when the remote area only has 100 meters or less?

TUNet's combination of "right-sized" LANs, intelligent endpoints, prioritized messaging, guaranteed message delivery, and near-real-time data delivery, rather than batching, results in much more efficient use of network capacity and provides a more reliable communications network.

Endpoints

Electric Meters with TUNet Communication Modules – Itron, Aclara and Landis+Gyr meters are available with integrated TUNet communication modules for single-phase and polyphase metering applications. The single-phase meters can be equipped with an optional integrated disconnect switch to support remote disconnect and reconnect for move-in/move-out, collections and prepayment applications. This integrated meter/module solution is assembled and calibrated at the manufacturer's facility.

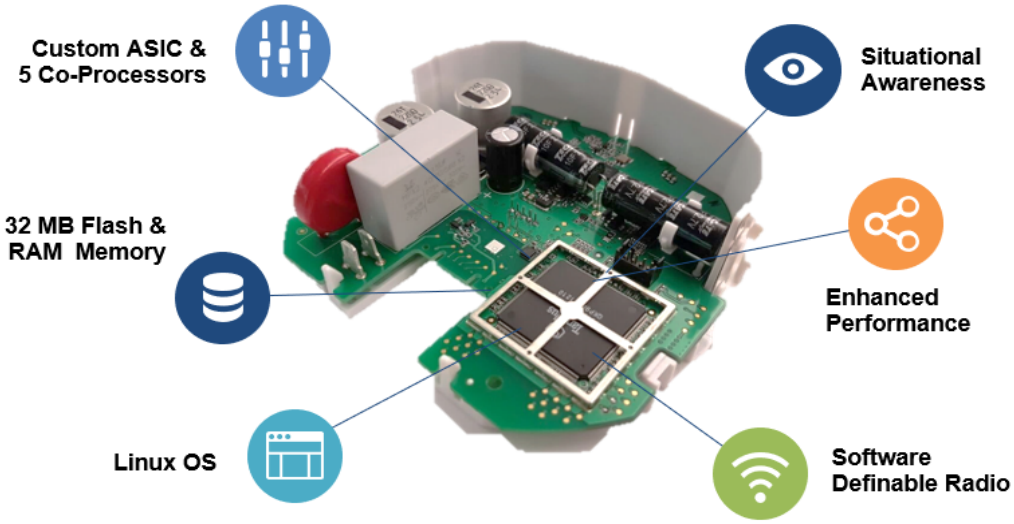
The DA Bridge Modem is an industrial modem designed to route SCADA protocols (DNP3) over the TUNet network. It features Tantalus TRUPUSH™ technology for instant, field-initiated event notifications such as outage alerts or load shed success without device polling.

Home Area Network (HAN)

Tantalus Load Management System (TLMS) works with HVAC systems, electric water heaters, pool pumps, electric vehicle chargers, and a variety of other large and small loads. The solution supports load control events, static and dynamic rate structures with automatic price response. Through TLMS the utility can design and execute load control events either immediately or in the future. Events can be defined as mandatory or voluntary with various levels of priority.

Endpoint Power

Tantalus was the first to introduce a high-resolution real-time data processing platform that supports distributed intelligence at the endpoint. The TUNet communication module is Linux-based with a powerful ASIC and 5 co-processors, 32MB RAM + 32MB flash and powerful computing capacity. It was first introduced in 2013.



The Tantalus TUNet Communication module is an intelligent endpoint that supports analytics and reports edge data by exception. Distributed intelligence is the ability to analyze more granular data at the endpoint, make decisions, and take actions without having to ship all of the data to the central server, reporting only the relevant results. Tantalus has embedded the computing power of a smartphone into an AMI communication module making smart meters and devices even "smarter". This enables advanced communications, high-resolution data processing and analysis in the edge device. This platform was built with support for tomorrow's predictive analytics, not just historical analysis of yesterday.

Tantalus' powerful intelligent communications module enables Tantalus to provide a unified software platform that takes smart metering and grid communications beyond the world of static firmware running basic, pre-programmed functions to a robust platform for software applications that can be upgraded via

over the air updates. With this platform, Tantalus has provided a future-proof endpoint with the ability to support and deploy new features as they become available.

Security-Enhanced Linux OS provides a secure application platform. It also provides for rapid software development on a standardized platform that can support 3rd party endpoint applications. Based on work by the National Security Agency (NSA), SELinux provides enhanced security over many other systems and is utilized by the Department of Defense for critical systems.

LAN Behavior

TRUPUSH

With TUNet's TRUPUSH technology, data from the electric meter is pushed to the TCC headend within the next interval period. For example, 15-minute interval data is sent every 15 minutes. TUNet can support data as frequent as every 5 minutes. The data is routed through the WAN and backhauled to the headend. Tantalus' utility customers are using TRUPUSH technology to enable applications where near real-time data is required such as voltage management, checking transformer/line loading prior to servicing, power factor management, grid optimization (e.g. CVR, VVO) and faster response to exceptions such as consumption on inactive accounts. TUNet's near-real-time data delivery enhances customer portals.

Automatic Registration and Self-healing

The LAN is self-initializing, self-healing, and self-optimizing. Upon initial power-up, the meters find an optimal path to the TCC and several alternate paths. Multiple paths are stored in the TUNet communication module within the meter. If the primary path is not viable (loss of communication between the meter and the TCC), the meter will utilize one of its alternate paths to push data to the TCC.

Message Prioritization

The TUNet system utilizes priority messaging to provide efficient use of the network and timely data delivery. TUNet supports 8 levels of message priority with the highest level reserved for DA, followed by outages, then alarms, with interval data delivered at the lowest priority. When meters generate high priority data, the data is immediately pushed to the VC and on to the TCC. Low priority data (which accounts for the majority of messaging on our systems today) is pushed through the network within the following interval and momentarily aggregated with other low priority data before being delivered, increasing the efficiency of the WAN.

Scalability

TUNet provides a robust platform to support multiple applications and scales easily to accommodate additional endpoints and/or data requirements by adding Gateways, Routers and/or increasing the capacity of the TCC server. Tantalus will appropriately design the network based on the number and location of endpoints and the data requirements. The design includes excess capacity to support additional functionality and/or devices. The server hardware and software requirements are calculated based on the number of devices and the messaging required (i.e. interval frequency).

The LANs typically have significant excess capacity. Interval data uses a small fraction of the capacity with the vast majority reserved for advanced applications such as outages, restorals, DA, street light, load control, voltage monitoring, and other future applications.

Flexibility

The Tantalus Utility Network (TUNet) can support multiple meter vendors on the same network. These meter vendors include Itron (Centron C1S and C2S, Sentinel), Aclara (i210+, kV2c), and Landis+Gyr (FocusAXe). This flexibility allows our customers to potentially retrofit existing meters when migrating to AMI, or chose the preferred or most competitively priced meter in the market.

Outage and Restoration Performance

All TUNet modules can detect the loss of AC voltage. Supercapacitors that continue to provide power to the device after AC voltage is lost, and Gateway devices use batteries to maintain power for several hours. These combine to keep the network operating to report outages. As soon as the module detects loss of AC voltage, it begins to time the outage. The TUNet module identifies outages that are shorter than a configurable duration and records them as blinks. This configurable duration is referred to as the outage qualification time, which can be set to between 1 and 10 seconds. Blinks are handled separately and are not reported as outages. If power is restored before the outage qualification time has elapsed, the TUNet module logs it as a blink and does not send outage and restoral messages. However, once the outage qualification time has elapsed without power being restored, the TUNet module immediately sends an outage message, which includes the time of the outage and the kWh register reading at the time of the outage, through the network to the TUNet head end. The supercapacitors power the TUNet modules long enough to send the outage messages, with retries if necessary, and also to relay outage messages from other devices.

In a multiple-meter outage scenario, 85-100% of devices typically report an outage to the head end within one minute of the onset of the outage, assuming the system is deployed and maintained as recommended. Actual performance depends on the extent of the outage and the characteristics of the network – some outage messages may not make it up through the network in a nested outage scenario if the upstream meters have already been down long enough for their supercapacitors have discharged – but a number of properties of TUNet's outage reporting design and the TUNet network in general combine to provide superior outage reporting performance. This has been demonstrated in utility trials comparing TUNet's outage performance with other systems. These design advantages include:

- TUNet's long range and network designs tend to result in relatively "flat" LANs. Unlike other vendor's designs that tout large LANs and the ability to hop 16 times, Tantalus has chosen a different approach, one that creates a more stable, less chatty network. Although TUNet LANs can support 15 hops by design, meters are typically only a couple hops from the Gateway devices. This minimizes the dependence on parent meters to relay outage messages to the Gateway, and minimizes the impact of nested outages.
- TUNet outage and restoration messages are sent only on defined message paths rather than broadcasting them to all devices as some other systems do. While it may seem intuitive that broadcasting increases the probability of a message getting through the network, it can have the opposite effect in a large outage scenario, because if a large number of meters are all doing this at the same time, collisions will occur and the messages won't get through. Better reliability is actually achieved by managing network traffic more intelligently and limiting the number of messages to only what is necessary.
- Another way TUNet manages network traffic is by acknowledging all messages, including outage messages. Systems that do not acknowledge outage messages have to send each message several times since there is no way to confirm that it got through the network. This flooding of the network with unnecessary retries can cause collisions and prevent other messages from getting through, especially in a large outage scenario. Acknowledging all messages enables TUNet to avoid this problem by retrying only messages that are not acknowledged.

TUNet has multiple methods available to report outages:

- System dashboard
- Event monitor
- TRUView GIS tool, which shows outages on a map
- Real-time email or text notification
- Reporting to an outage management system (OMS) via easily integrated MultiSpeak interfaces

If TUNet is being used with an outage management system, in addition to the blink filtering performed by the endpoint, an additional level of outage filtering is available in the head end on the outage messages it receives from the endpoints. The head end can be configured to distinguish between momentary and sustained outages, and report only sustained outages and their corresponding restorals to the OMS.

When used with an OMS in a multiple-meter outage scenario, typically the number of outages reported by TUNet is sufficient for the OMS to identify the full extent of the outage within 2 minutes. However, several Tantalus customers have found that they are able to effectively manage outages using TUNet without an OMS. TUNet's immediate outage, and the ability to view outages in the TRUView GIS tool, provide visual display of the location of outages that have been reported by the endpoints, enabling the utility to identify the source of the outage usually within a few minutes, even if some of the meters have not yet reported their outage.

When power is restored, the device attempts to get time from the network. This usually happens within seconds. Once the device knows the time, it calculates the time when power is restored, and immediately sends a timestamped restoral message through the network to the head end. Typically, 90% of restorals are reported to the head end within one minute after restoration, and 100% within 5 minutes, assuming the network infrastructure devices that the meter communicates with have also powered up or are still being powered by their batteries. If this is not the case, then because all messages are acknowledged, the device will know to retry sending the restoral message when power has been restored to the device that did not acknowledge the message.

Upon receipt of the restoral message, or any other message from a device that was in an outage state, the head end reports the restoration on the event monitor and, if enabled, by email or text, and clears the outage. Meters that were unable to successfully send their outage message through the network before the supercapacitor discharged will send their outage message with the restoral message, so that the fact that they were in an outage is recorded, along with the time of the outage and restoral, but the outage is immediately cleared.

Beyond AMI Capabilities

- Distribution Automation: The Tantalus DA Bridge Modem allows for down-line automation devices to be seen and managed using DNP. Our partner S&C is doing this to leverage TUNet for their latest devices being deployed in the public power space.
- CLVR: Rather than having to deploy specialized bellwether meters, Tantalus's Closed Loop Voltage Reduction (CLVR) can report voltage data in near real-time from any designated meter allowing operators to make decisions without guesswork. When integrated with a SCADA system, Tantalus's near real-time push technology enables the utility's SCADA system to lower feeder voltages within seconds.
- Streetlight Control: Tantalus notes that most public utilities have already begun to deploy LED streetlights. Tantalus has partnered with LED Roadway to enhance our technology offering to our customers. By deploying the Tantalus module in LED streetlights, the Tantalus TUNet AMI can reduce costs and enhance community safety by adding functions such as motion and audio detection.
- Tantalus Load Management System (TLMS): TLMS works with HVAC systems, electric water heaters, pool pumps, electric vehicle chargers, and a variety of other large and small loads. The solution supports load control events, static and dynamic rate structures with automatic price response, energy efficiency. It supports customer engagement through a browser-based consumer portal as well as mobile apps for both iOS and Android devices. Devices are reached through a combination of TUNet, Wi-Fi and ZigBee, and no special options are required in the meter to enable HAN functionality in the future.

Additional Meter Reading Capabilities

Electric ERT Technology

Currently Tantalus has a partnership with Itron to read electric ERT technology messaging protocols over TUNet. This capability allows existing R300 Electric ERTs to broadcast consumption data over-the-air to TUNet modules that intercept and then transmit the data to the head end. This "ERT Overlay" concept has been extremely popular with a number of our clients, as it provides a significant AMI benefit at a fraction of the cost. Typically, in and ERT overlay only 1 in 5 meters needs to be replaced, depending on the geography and proximity of adjacent meters. This capability works in tandem with the other ERT commodity reading capabilities listed below.

Water Meter Reading

Tantalus is unique in our unmatched water reading capability. Currently Tantalus has a partnership with Itron to read water ERT technology messaging protocols over TUNet. Additionally, Tantalus has developed the capability to also read communication modules from Badger Orion as well as Neptune Systems.

The capability to read water allows existing 60W and 100W ERT communications devices to broadcast consumption data over-the-air to TUNet modules that intercept and then transmit the data to the head end. This allows utilities to increase the useful like of existing assets, often saving significant amounts of money when compared to a "rip-and-replace" approach. Please see the included "Tantalus ERT Value Proposition" included below.

Gas Meter Reading

Currently Tantalus has a partnership with Itron to read gas ERT technology messaging protocols over TUNet. This capability allows existing 100G ERT communications devices to broadcast consumption data over-the-air to TUNet modules that intercept and then transmit the data to the head end.

Project Management Approach

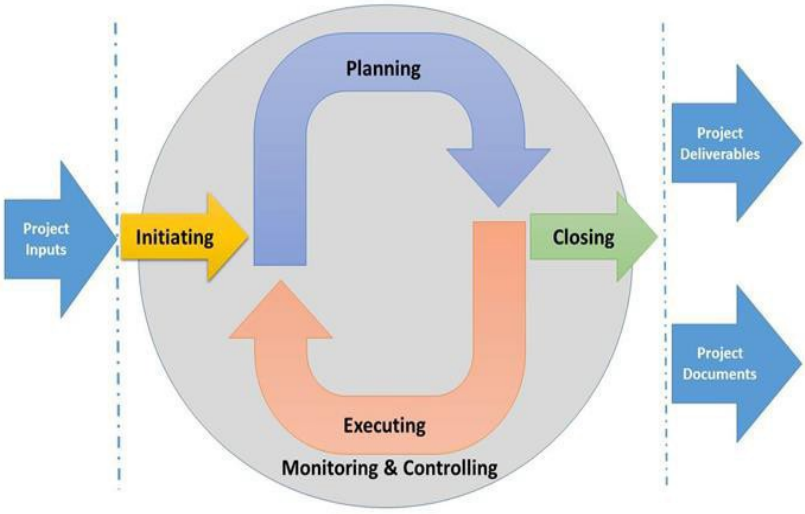
With more than 180 TUNet customers representing 3 million endpoints in North America, Tantalus has gained valuable experience and has learned that the best approach for a successful deployment is collaboration. A utility's AMI project involves much more than deploying the TUNet system. Other utility systems and work flows are impacted and must be identified and managed by the utility.

At the center of a successful AMI project are the Project Managers. One Project Manager from Tantalus and one Project Manager from the utility, planning, executing, controlling, monitoring and adjusting their respective work in coordination. Each with the required authority to get the job done and the support of many others in their organizations. Tantalus works closely with our customers to establish a project team that includes the utility, other vendors and Tantalus resources as applicable.

All Tantalus Project Managers follow a well-known Project Management Process defined by the PMI PMBOK Standards which are generally accepted as best practices for project management.

Though much of the work is interrelated and dependent on one another, the work of an AMI project can often be described and organized by five processes:

- Initiating
- Planning
- Executing
- Monitoring and Controlling
- Closing



Initiating

This start-up phase begins with the identification of project stakeholders and approval for each organization's resources to engage in the project. The two Project Managers will confirm this prior to the Project Kick-off Meeting.

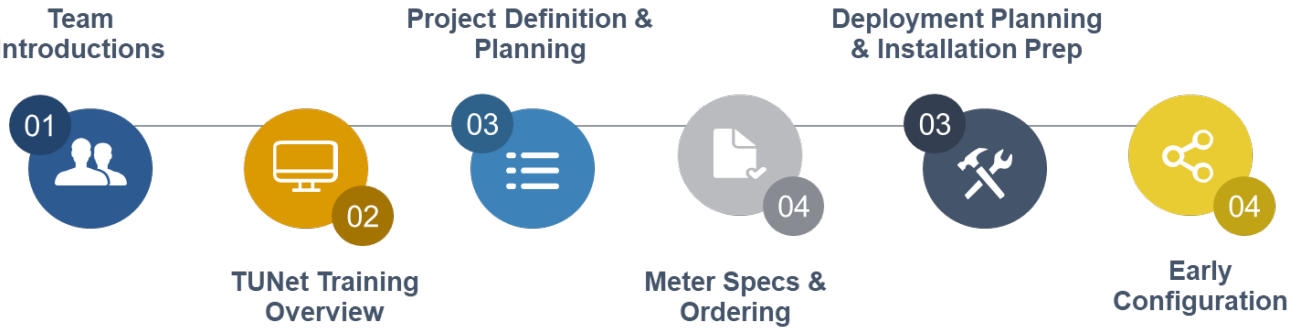
The Statement of Work will be agreed to and included in the contract. This document defines the scope of work to be completed, the timelines for the overall project, and provides visibility into the interdependencies required to achieve the desired outcome. It will assist all parties in understanding and executing their respective roles, responsibilities and tasks.

Risk Management

Risk Management planning will be initiated at the start of the project by discussion with the customer prior to or during project kick off. Tantalus uses a risk tracking tool to analyze, prioritize and assess the impact of project risks. Risks are assigned a weight based on probability of occurrence and severity of impact. As part of iterative process, risk reviews are conducted and updated on a regular basis.

Planning

Planning activities include defining the scope, defining tasks, developing the schedule, identifying risks and mitigating actions, and identifying resources to produce project plan. The project plan is a living document, and as such will be updated throughout the project.



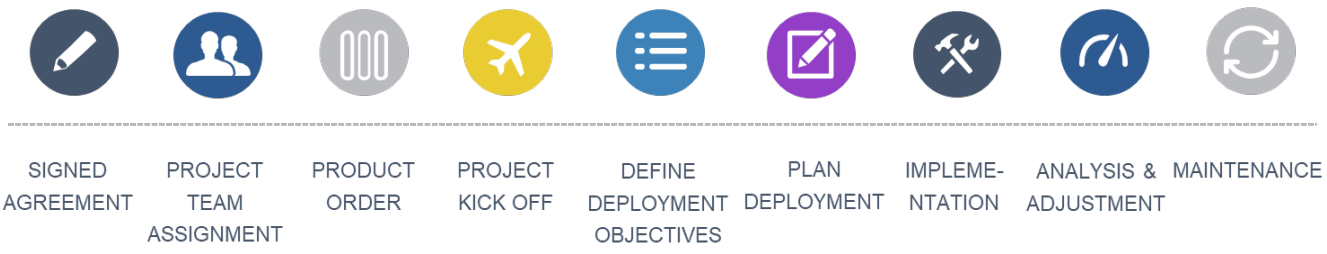
Using the Statement of Work, a Work Breakdown Structure (WBS) is created for all the activities needed to deliver the scope. The activities are then sequenced with dependencies identified. The tasks and activities are grouped in phases, milestones are identified and time estimates are determined. The project schedule is then reviewed for errors and approved by the Customer and Tantalus and baselined. The project schedule is then reviewed at project meeting.

Project procedures will be mutually agreed to and used by all parties as a means to control activities between the utility and Tantalus. These procedures will include the Project Schedule and Management of the Schedule, timing and frequency of Project Review Meetings, Change Order procedures, formal transmittal requests and acknowledgements.

Schedule

The deployment schedule is critical in any AMI project and is carefully managed by the Tantalus project team. The initial deployment plan is documented early in the design process and updated as necessary. Project Review meetings will occur at least quarterly and should include representatives of all stakeholders. Smaller team meetings often occur weekly or as needed.

The meetings will include a review of the deployment schedule and identification of potential risks to the schedule. Mitigating plans will be discussed, agreed to and formally communicated to the team.



Tantalus is committed to ensuring successful Smart Grid deployments for our customers.

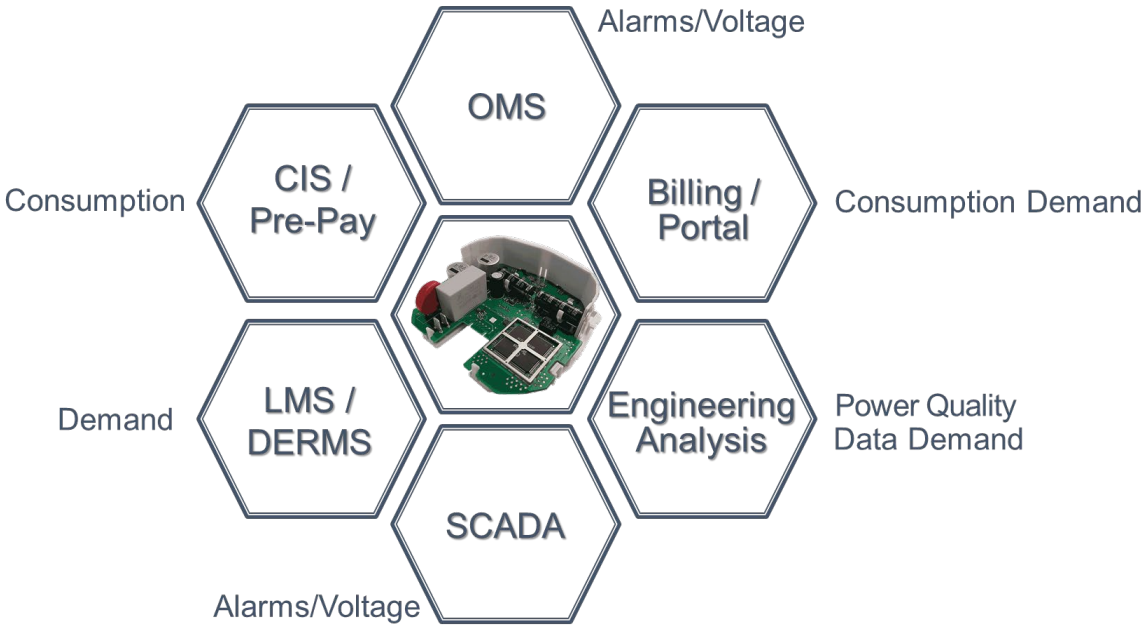
Project Kickoff Meeting

The Project Kickoff Meeting typically covers these key tasks:

- Project Management Activities - deliverables, ordering, invoicing, meetings, reports and communications
- IT Infrastructure - server and TUNet Control Center installation, VPN requirements, backup
- Other Vendors, if applicable - roles of Subcontractor or Utility's other vendors
- Network planning
- IT integration planning
- Field Installation
- Meter Configurations
- Training
- Project Plan and Schedule planning

Executing

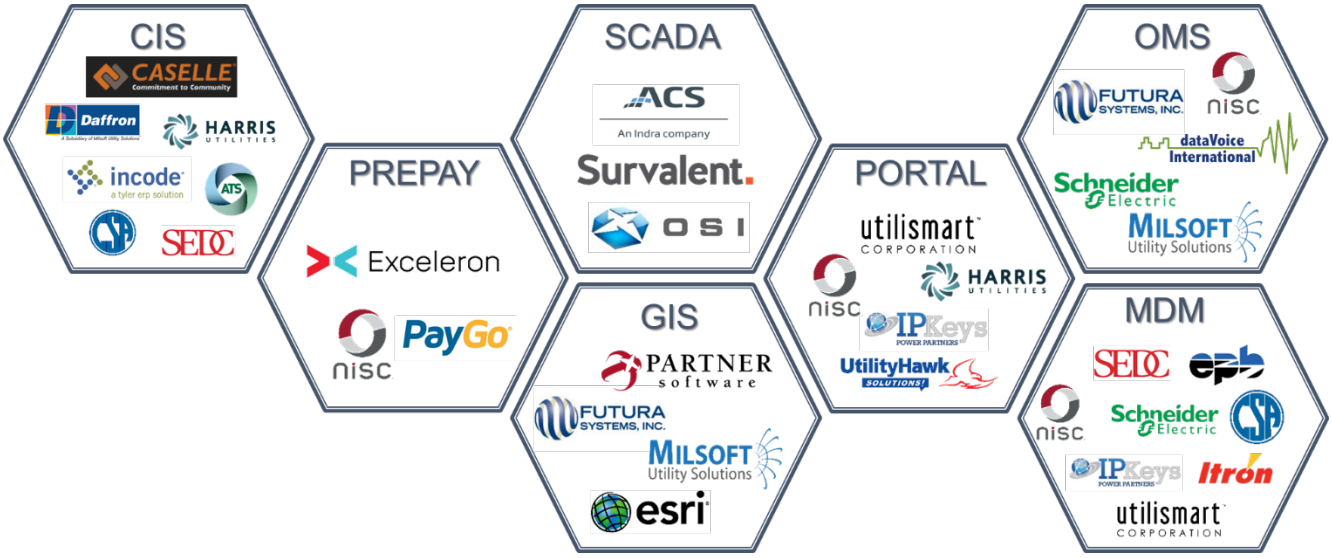
Implementation of the plan requires the project manager to monitor, manage and control the resources, and ensure that the project is on track to deliver the project objectives. Common activities include confirming/refining the network design, procuring hardware, installing and configuring the head-end, installation and testing of the field network infrastructure, installation of meters, integration to others systems (i.e. MDM, CIS), testing of integration and training.



Tantalus will develop a detailed coverage plan for the AMI communication network, which ensures that any smart meter installed in your service territory will meet the AMI performance requirements.

Integration

Tantalus will work with your billing vendor to integrate the two systems. With further discussion among all parties, we will document the requirements and desired outcomes of the integration. TUNet has been integrated to many utility enterprise systems.



Problem Resolution

Our approach to problem resolution is effective and easily measured. We define the issue, determine the causes, generate ideas to resolve issues, select the best solution and implement. The issue and resolution are also recorded and reviewed in the project post mortem, lessons learned meeting.

Training

Training is a key component to ensure your staff is ready to operate and maintain the AMI system. Tantalus works with your project team to provide training that includes Tantalus led and train-the- trainer programs focusing on the deployment and maintenance of all field devices, TUNet user interface for utility operations and network administration and finally, operation of the system as a whole as it is integrated with other utility applications.

Monitoring and Controlling

Project status is tracked and reported on a regular basis to identify variances from the project management plan in terms of the project performance baseline (time, cost and scope). An important aspect here is that only approved changes are implemented.

Scope Change

All changes to the project scope require a Scope Change Document necessary to amend the SOW for reasons including, but not limited to, the following:

- Discretionary changes to the project schedule
- Discretionary changes to the project scope

- Non-availability of products, resources or services which are beyond Tantalus' control
- Environmental or architectural impediments not previously identified
- Lack of access to client personnel or facilities necessary to complete project

The Change Order must describe the change, reasons for the change, and the anticipated effect the change will have on the project. The Change Order may include, but not be limited to, scheduling changes, pricing changes, etc. A change order may be initiated by either customer or Tantalus. The customer and Tantalus Project Managers will review the change order and either approve or reject it. If further investigation is requested in order to determine the scope of the change, any charges for that investigation will be outlined. Both Project Managers will be required to sign the Change Order indicating acceptance. Upon acceptance of the change request by both Project Managers, the changes will be incorporated into the project.

Quality Assurance

Quality Assurance (QA) is an ongoing effort and a focus from the start of the project. It is measured in several ways – all of which impact the level of customer satisfaction. As such, our goal is to provide continual monitoring and control of QA. Data quality, integration and training are among the most important factors to consider as part of QA.

Tantalus approach to training is very collaborative and as a result, it starts early. In addition to our training plan, we evaluate each customer's needs and provide the necessary training. We believe that an educated, well-trained customer is best equipped to fully realize the benefits of TUNet.

The User Interface includes a wealth of information on the health of the network and the quality of data. In addition, there are many reports available including the Timed Reading report which highlights any problems with data continuity and can trigger investigation if needed.

Closing and Transition

Closing and transition ensures that the project deliverables are accepted, that the support environment is in place, that any lessons learned are passed on, and documentation is provided.

System Acceptance

System acceptance does not always require formal System Acceptance Testing. Tantalus always verifies the functionality of the system prior to recommending its release into production. Please see the Testing section below.

Support

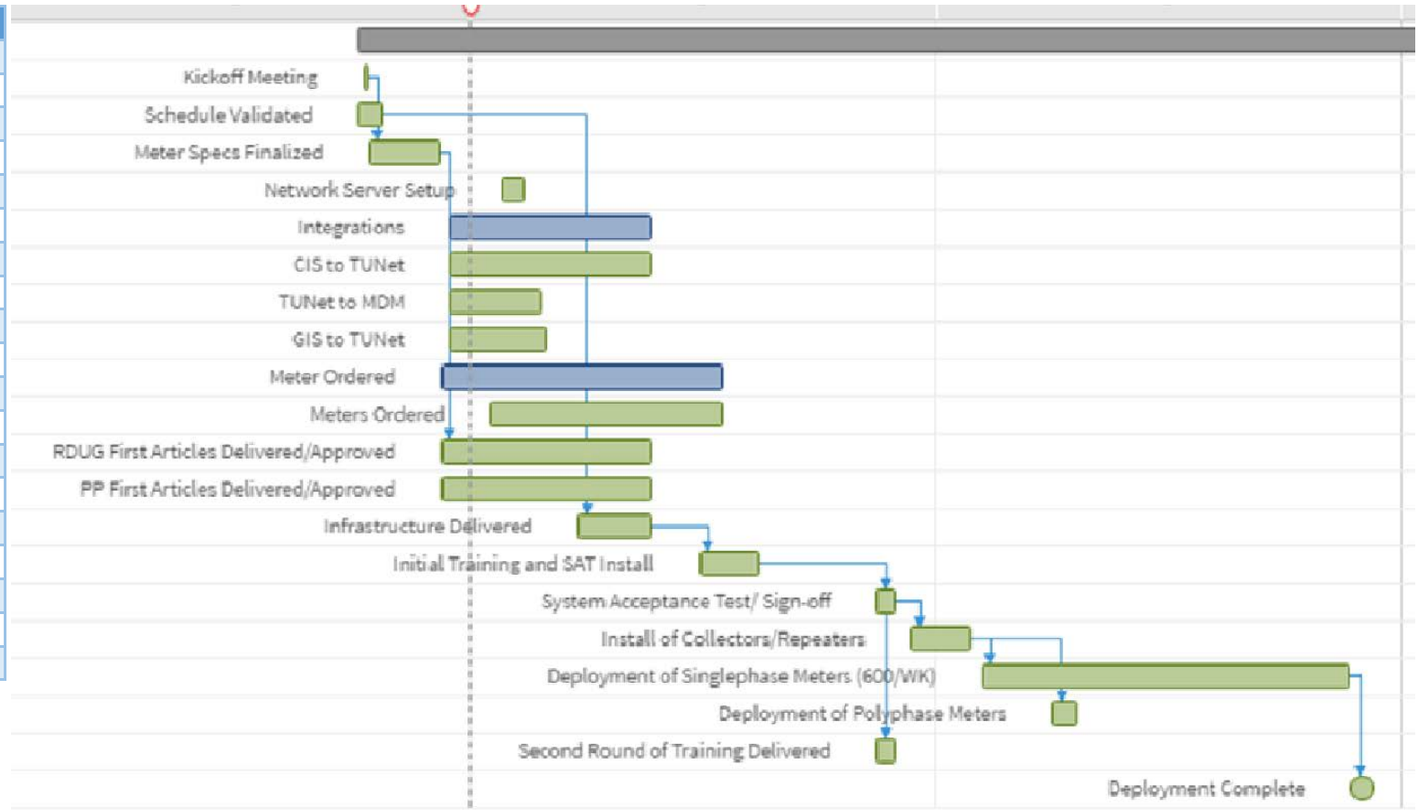
The Tantalus team provides a robust mix of onsite and remote support as needed throughout the project. After the new AMI system is established, and under an applicable service agreement, the utility can obtain assistance on TUNet related issues through the Tantalus online support portal (the Tantalus Team Room/Customer Community) or the Customer Support team.

Sample Project Schedule

Below is a sample project plan. In collaboration, we will develop a plan based on the specifics of the deployment and further detailed as needed after the Kickoff Meeting. The final plan will be mutually agree to.

Item	WBS	Start	Finish
Kickoff Meeting	1	TBD	TBD
Schedule Validated	2	TBD	TBD
Meter Specs Finalized	3	TBD	TBD
Network Server Setup	4	TBD	TBD
Integrations	5	TBD	TBD
CIS to TUNet	5.1	TBD	TBD
TUNet to MDM	5.2	TBD	TBD
GIS to TUNet	5.3	TBD	TBD
Meters Ordered	6	TBD	TBD
RDUG First Articles Delivered/Approved	6.2	TBD	TBD
PP First Articles Delivered/Approved	6.3	TBD	TBD
Infrastructure Delivered	7	TBD	TBD
Initial Training and SAT Install	8	TBD	TBD
System Acceptance Test/ Sign-off	9	TBD	TBD
Install of Collectors/Repeaters	10	TBD	TBD
Deployment of Singlephase Meters	11	TBD	TBD
Deployment of Polyphase Meters	12	TBD	TBD
Second Round of Training Delivered	13	TBD	TBD
Deployment Complete	14	TBD	TBD

SAMPLE PROJECT PLAN



Advanced Applications

Load Management System ("TLMS") & Distributed Energy Resource ("DER") Integration Solution:

TLMS consists of a utility software application and a suite of load control devices that together manage customer appliances and/or load profiles automatically on behalf of a utility. TLMS is able to manage a diverse set of common load types such as central air conditioners and electric water heaters. TLMS is also able to manage a set of high-value loads that are particular to rural utilities and small municipalities, such as whole-home electric heating, electric thermal storage appliances and agricultural irrigation pumps. TLMS also delivers the foundation to integrate DERs behind the meter, including roof-top solar panels, electric vehicle charging stations, battery wall storage and back-up generators.

TLMS takes full advantage of the TUNet smart grid communications network and Tantalus' comprehensive user interface, TUNet Insight. By offering TLMS in conjunction with the Company's AMI system, Tantalus ensures direct, reliable and fully-interactive communications that are necessary to generate the full economic benefits of demand management. Using TLMS, utilities can offer programs to customers that fit their lifestyles and usage patterns, minimize negative impacts, and allow them to interact and manage their participation. The extensive field data collected by TLMS and TUNet Insight drive utility decision-making around program design as well as ongoing operation.

TLMS can work in tandem with Tantalus' AMI solution to support the next generation of technology-enabled rate plans, including Time of Use and Variable Peak Pricing. This combination, known as "Prices-To-Devices" is proven to benefit the utility and program participants significantly.

Grid Optimization & Distribution Automation ("DA") Solution:

An electric distribution grid is a massive distributed collection of expensive transformers, wires, poles, and other assets. Investments and expansions are expected to last for decades and are planned to accommodate future growth accordingly. Thousands of miles of line require expensive maintenance on an ongoing basis. Investment planning and maintenance scheduling has traditionally depended on guesswork and resulted in waste. When a transformer becomes overloaded or the need for tree-cutting becomes critical, the result can be a wildfire with devastating consequences.

To ensure utilities make the best investment in their respective distribution grid equipment, Tantalus is leveraging data from connected meters to deliver a new analytics tool that enables a utility to proactively identify latent issues that affect system reliability. The TUNet Grid Reliability Analytics solution collect extensive data from the entire grid edge where the meters and other devices are, and where utility customers actually live and work. This data holds key information about power quality experienced at each location. The insights that can be gleaned from this data help utilities plan investments (such as identifying heavily-loaded transformers and properly-sizing a replacement) and maintenance (such as detecting stretches of powerline being brushed by power lines) so these activities can be prioritized. The solution has also helped utilities detect and avert safety issues at customer homes.

With the TUNet Grid Reliability Analytics solution, engineering departments within a utility are also able to identify portions of their feeders that frequently experience blinks and flickers not detected at the substation or reported by an Outage Management System ("OMS"). By utilizing Tantalus' Grid Reliability Analytics solution, utilities can determine whether disturbances occur due to environmental effects such as lightning, high wind gusts, freezing rain or snow, or seasonal disturbances such as known migratory animal patterns. Dispatchers and foremen will be alerted to flickering locations typically indicative of failing transformers, splices, secondaries, underground micro faults, service lines, socket corrosion, and loose lugs through the alarming and reporting system before they become larger problems.

Similarly, utilities are able to resolve flicker complaints efficiently as a dispatcher can immediately track the history of complaints and identify whether a problem is affecting neighboring service locations,

indicative of a secondary or a transformer problem. Utilities can triangulate data through the Grid Reliability Analytics solution to determine whether flickers only occur on windy days indicating a tree trimming crew is required. In many cases, it may be evident that the flickering is not detected by the meter but may in fact be a problem inside the home. These are some examples of how Tantalus' customers have leveraged the Grid Reliability Analytics solution to resolve day-to-day operational challenges.

DA provides utilities real-time awareness and control of the distribution grid downline from substations and closer to the customers. By connecting smart distribution devices throughout the field, DA improves power quality, reduces operating costs and enhances safety. The TUNet smart grid communications network can be leveraged to deliver connectivity to DA devices anywhere in a utility's service territory. Rural utilities often have far-reaching circuits that can take an hour or more for crews to reach when there is an incident. DA equipment can eliminate some of these incidents and reduce the severity of others, and TUNet provides the needed connectivity.

The most advanced electricity distribution networks actively manage voltages across their grids to minimize energy losses and manage energy supply costs, but must do so while ensuring acceptable power quality for customers. To do this, utilities often utilize a complex grid modelling system and must run a safety margin to protect customers that experience voltages different from what the model predicts.

As part of its Grid Optimization and DA capabilities, Tantalus offers a solution called Closed Loop Voltage Reduction ("CLVR™"), which turns TUNet-connected smart meters across the distribution grid into voltage monitoring DA devices. In so doing, Tantalus delivers an ideal voltage management solution by giving utility systems real-time feedback on the actual voltages being experienced by customers at the premise. As a result, utilities can avoid the need for grid modelling, and reduce or eliminate the safety margin to get optimal results without risk to its customers.

Smart Community Solution:

Street lighting is a ubiquitous and energy-intensive feature of municipalities. Lighting control solutions are one of the primary ways that municipalities look to improve efficiency and service delivery to their residents.

Tantalus offers TRULight™ Intelligence, a full-featured lighting control solution that also takes advantage of the fact that street lights are widely-distributed and elevated, and so ideally placed to incorporate sensors and act as communication nodes in a smart community solution.

TRULight Intelligence provides monitoring and on/off/dim capabilities to standard LED streetlights, parking lights, security lights, and other lighting assets, substantially reducing lighting energy costs while increasing public safety and lighting asset life by "right-sizing" the amount of illumination according to vehicle & pedestrian traffic and other factors. The browser-based lighting management software provides lighting and health analytics, flexible grouping and lighting profile capabilities, integrated geospatial information and a workflow maintenance management system.

A variety of sensors are available to monitor traffic, noise and air quality. These help municipalities to direct emergency services, manage traffic, and plan future investments that will enhance the safety and quality of life for their citizens.

In addition, most TRULight Intelligence lighting controllers are able to read many common types of electricity, water and gas meters, providing further cost efficiencies for the municipality.

Addendum Acknowledgement Form

City of Escanaba AMI RFP

Addendum

In submitting this Proposal, the Vendor or Bidder represents that:

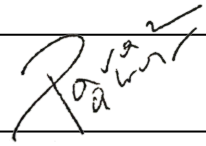
A. Vendor or Bidder has examined and carefully studied RFP Documents, other related data identified in the Documents, and the following Addenda or Amendments, receipt of which is hereby acknowledged:

Addendum/Amendment	Description	Date
1	Added supporting documents: customer locations, response template	5/3/21
2	Changed RFP language in parts (4) and (9)	5/5/21
3	Submission Date changed to June 15th, 2021	5/6/21

B. Vendor or Bidder is familiar with and is satisfied to all Laws and Regulations that may affect cost, progress, and performance of the AMI Solution.

Company or Institution Name: Tantalus Systems Inc.

Authorized Individual

Param Pawar, Vice President, Finance	
Name (print)	*Signature*

Appendix A: Tantalus ERT Value Promise

The Tantalus ERT Promise:

No Asset Left Behind

No Community Left in the Dark

Tantalus
Helping local communities thrive for over 30 years.
1989-2020

A Tough Mandate

Public power and electric cooperative utilities face a tough mandate—embrace long-term digital transformation while still achieving near-term improvements in costs and service. It's an even tougher mandate when you consider that they have to deal with aging infrastructure, resource constraints and escalating consumer expectations. More importantly, there's a deeper question for utilities to consider—how can they select the right solution that ultimately supports the safety, prosperity and autonomy of the communities they serve?

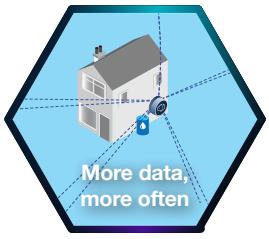
A Promising Solution—With One Catch

One way many utilities are addressing these challenges is to extend the life of their existing assets, such as ERT® drive-by AMR systems, by investing in smart grid technologies that transform their capabilities. But when you take a closer look, most vendors fall short. They fail to capture all of the critical data available from the existing ERT devices. They also require you to replace **all** of your existing ERTs with **their own** AMI modules before truly eliminating the need for drive-by readings. Worse yet, these vendors don't share your priorities — those of public power and electric cooperative utilities.

Find your way out of this catch-22—with Tantalus TUNet.®

TUNet: Expandable, Flexible, and Purpose-Built

The Tantalus Utility Network, "TUNet," is purpose-built for public power and electric cooperative utilities who want to make the most of their existing infrastructure. When it comes to working with your current ERT deployments, TUNet is the smartest investment you can make. It's expandable, flexible, and provides the foundation for future innovation.



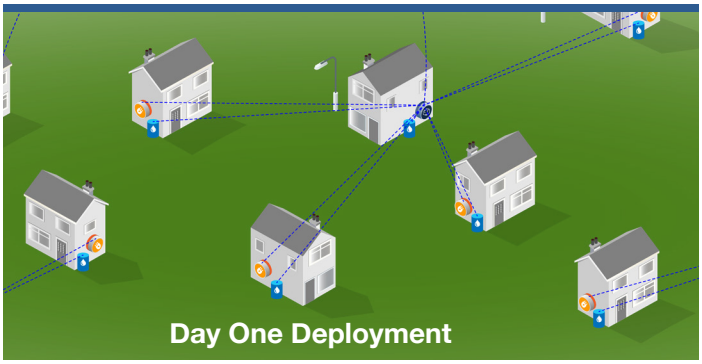
At Tantalus, we don't believe in forced upgrades or needless rip-and-replace strategies. TUNet is designed to ensure that **no asset is left behind and no community is left in the dark.** Since 2012, Tantalus is the only authorized supplier licensed by Itron to deliver all available data from Itron Electric, Water and Gas ERTs, including the latest 100 Series Water and Gas ERTs and R400 Electric ERTs. TUNet also supports Badger meters, across the same fixed communications network.

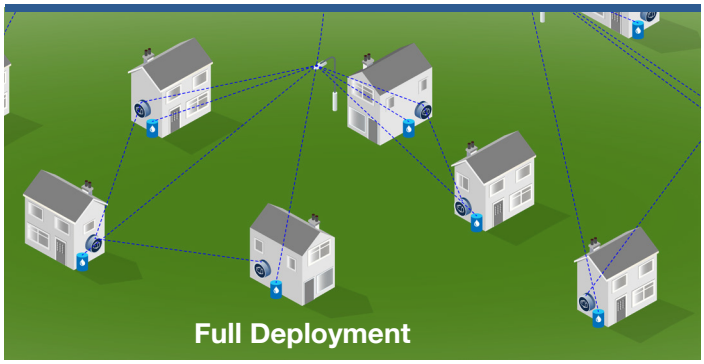
That means we immediately eliminate drive-by reads and help utilities reap the rewards of two-way AMI **by replacing as little as 20%** of their current ERT population. By investing in a Tantalus solution, you're extending the life of existing assets while investing in your long-term future, now.

How It Works

The solution is straightforward. The first step is deploying the Tantalus Overlay Solution which upgrades a small percentage of existing Electric ERTs with TUNet endpoints. Existing Water and Gas ERTs integrate seamlessly providing a smart grid infrastructure. Interval reads from the ERTs are delivered regularly. Best of all, the fixed network replaces the need for drive-by reads right from the start.

Then, whenever the utility is ready, it's a simple, straightforward migration to a full deployment, replacing all Electric ERTs with TUNet endpoints. This final step saves even more money, integrates seamlessly with the Water and Gas ERTs in place, and creates even more opportunities to provide new features and improved service based on our superior data-reading capabilities.





Don't Ditch Your ERTs, Ditch Your Drive-By!

Tantalus' approach allows you to say goodbye to time-consuming and costly drive-by reads without locking you into a solution that forces you to upgrade against your will. Instead, you can:

Achieve immediate benefits from a 2-way AMI smart grid infrastructure

Upgrade to a full deployment, but only when it's the right decision for you

Stay in control of your technology future while laying the foundations for future innovation

The Tantalus Difference

It's not just our technology that sets us apart.

When you partner with Tantalus, you partner with a company that's purpose-driven to help utilities like yours thrive. You partner with people who believe that your voice matters, and a company with an unwavering commitment to public power and cooperative utilities.

30+
years of supporting public power and electric cooperative utilities

100%
of our systems are deployed with public power and electric coop utilities

175+
utilities included in our growing and active user community

80+
multi-commodity utilities extending life and increasing value of Electric, Water and Gas ERT devices

50+
utilities "Going Beyond AMI" with load management, DA and advanced lighting

Want to learn more? Contact **tantalusinfo@tantalus.com**

www.tantalus.com

Tantalus

Tantalus
Tomorrow's Smart Grid. Today.

Tantalus Systems Inc. 1130 Situs Ct., Ste. 230, Raleigh, NC 27606
P: 919.900.8970 | F: 919.900.8978 I www.tantalus.com

TANTALUS' UNIQUE VALUE PROPOSITION FOR UTILITIES WITH ITRON'S ERT® TECHNOLOGY

In 2011, Tantalus and Itron partnered to deliver a unique, joint solution to read ERT® endpoints through a communications network for municipal and cooperative utilities. The solution enables utilities to efficiently and cost-effectively migrate from a one-way, drive-by or walk-by reading system to near real-time meter reading via TUNet® – the Tantalus Utility Network – configured as a fixed network, two-way AMI solution. The solution is capable of supporting multi-commodity utilities, including electric, water, and gas.

Itron recently learned that some competing AMI solution providers are falsely representing that Itron is planning to terminate its support of ERT endpoints entirely by 2021. This information is false and Itron has formally demanded that these other solution providers immediately cease misrepresenting Itron's commitment to its ERT technology.

Tantalus is the sole licensed AMI provider of Itron's ERT technology. No other AMI vendor has the technical or legal capability to read or access the extended data available from ERT endpoints. Without an express written license from Itron, vendors are legally prohibited from accessing the extended ERT data. Although other AMI providers may be technically capable of reading the one-way SCM+ message, the data that can be accessed from such messages is just a subset of the complete data, and corresponding value, made available by Itron Datalogging ERTs for which Tantalus is the sole licensed AMI provider. Furthermore, any other AMI solution provider that claims to be accessing the extended ERT data is infringing Itron's intellectual property and would be legally prohibited from doing so without the aforementioned license from Itron.

In addition to delivering information from an ERT endpoint including its ID, consumption read and tampering, Tantalus remains the only AMI provider which can also leverage a two-way, smart grid communications network to deliver granular data from ERT endpoints which can be used for customer presentment, demand calculations, time of use charge calculations, consumption analysis and distribution optimization analysis such as losses/leak detection. In being able to access the complete Datalogging from ERT endpoints, Tantalus can deliver greater value to utilities leveraging Itron's ERT technology while simultaneously extending and enhancing the long-term value of the ERT endpoints.

Further, the Tantalus ERT reading solution enables utilities to maintain their ERT investment while strategically migrating its metering infrastructure from a drive-by or walk-by reading system to a high-speed fixed communications network capable of supporting multiple applications including AMI, distribution automation and load management. By simply migrating an existing drive-by reading system to an alternative drive-by system or a limited radio frequency (RF) device, utilities will not access the full value of ERT endpoints.

Please contact Michael Julian, Executive Vice President, Sales and Marketing, Tantalus at mjulian@tantalus.com or (919) 900-8970 x105 for further information.

Appendix B: Bid Bond Documentation

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)
TANTALUS SYSTEMS INC.
1130 Situs Court, Suite 230
Raleigh, NC 27606

SURETY:
(Name, legal status and principal place of business)
ATLANTIC SPECIALTY INSURANCE COMPANY
605 Highway 169 North
Plymouth, MN 55441

OWNER:
(Name, legal status and address)
CITY OF ESCANABA, MICHIGAN
410 Ludington Street, Escanaba, MI 49829

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

BOND AMOUNT: Ten Thousand and 00/100 ($ 10,000.00)

PROJECT:
(Name, location or address, and Project number, if any)
Request for Proposal – Advanced Metering Infrastructure (AMI)
City of Escanaba, Michigan

Project Number, if any:

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 26th day of May, 2021

(Witness)	TANTALUS SYSTEMS INC. *(Principal)* *(Seal)*
	(Title)
(Witness) Megan Douaire	ATLANTIC SPECIALTY INSURANCE COMPANY *(Surety)* *(Seal)*
	(Title) Elizabeth K. Sterling, Attorney in Fact

intact INSURANCE

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Elizabeth K Sterling, Wesley P Williams, Benjamin A Stahl, Megan K. Douaire**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **unlimited** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-seventh day of April, 2020.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

By _____
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this twenty-seventh day of April, 2020, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.

ALISON DWAN NASH-TROUT
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2025

_____
Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 20 day of May, 2021.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

This Power of Attorney expires
January 31, 2025

_____
Kara Barrow, Secretary

Please direct bond verifications to surety@intactinsurance.com

Appendix D: Tantalus' Network Systems Agreement

*This Network Systems Agreement, including Exhibits hereto, is continuously reviewed and updated as necessary by Tantalus' Legal Division.
Should Tantalus be awarded the contract, it reserves the right to provide an updated Agreement as the basis for negotiations at that time.

TUNet® NETWORK SYSTEM AGREEMENT

THIS TUNet® NETWORK SYSTEM AGREEMENT ("**Agreement**") is made as of _____, by and between Tantalus Systems Inc., on behalf itself and its affiliates, having its principal place of business at 1130 Situs Court, Suite 230, Raleigh NC 27606 ("**Tantalus**") and _____, having its principal place of business at _____ ("**Customer**").

This Agreement includes the following Exhibit(s):

Exhibit A	End User License / Licensed Software Maintenance Agreement
Exhibit B	Technical Support Agreement
Exhibit C	Deployment Partnership
Exhibit D	Pricing
Exhibit E	Third-Party Products (If Applicable)
Exhibit F	Mutual Non-Disclosure and Confidentiality Agreement
Exhibit G	[Form of] Statement of Work; System Acceptance Test Plan

Each Exhibit is incorporated by reference into, forms part of and is governed by the terms of this Agreement. In the event of any inconsistency or conflict between the terms of any of the above Exhibit(s) and the terms of this Agreement, which is not otherwise addressed by a statement regarding precedence, the terms of this Agreement shall govern.

The Parties agree as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions. When used in this Agreement, the following terms shall have the respective meanings indicated, such meanings to be applicable to both the singular and plural forms of the terms defined:

(a) **"Affiliate"** means, with respect to any Party, any legal entity that such Party owns, is owned by, or is under common control with such Party. For purposes of the foregoing definition of "Affiliate", the terms "control" and "own" mean possessing a 50% or greater interest in an entity or the right to direct the management of the entity.

(b) "**Acceptance" or "System Acceptance**" means that the system acceptance tests set forth in the System Acceptance Test Plan as set forth in Exhibit G hereto have been completed and all requirements of Acceptance as set forth in Exhibit G hereto were met.

(c) "**Business Day**" means any day that is not a Saturday, Sunday or a Tantalus authorized "holiday".

(d) "**Confidential Information**" has the meaning set forth in the MNDCA.

(e) **"Destination"** means Customer's designated destination point for the delivery of Network Equipment;

(f) "**Dispute**" means any dispute, controversy, difference or claim, arising under or in connection with this Agreement, including its formation, validity, binding effect, interpretation, performance, breach or termination, as well as non-contractual claims.

(g) "**EULA**" means Tantalus' then current end-user software license agreement setting forth the terms and conditions of Customer's permitted use of the Licensed Software. A copy of the EULA, current as of the Effective Date, is attached hereto as Exhibit A, which EULA may be amended from time to time in Tantalus' sole discretion.

(h) "**Excusing Event**" means any (i) Force Majeure; (ii) failure, act or omission of Customer or its agents, employees, suppliers, subcontractors or consultants, including without limitation improper performance of Customer's responsibilities under the Agreement, or unreasonable delay or failure of Customer to approve changes that are relevant to an applicable failure; (iii) failure, act or omission of any third party (including any third-party supplier) or its agents, employees, suppliers, subcontractors or consultants; or (iv) failure of any components (hardware, software, network, maintenance) provided and/or maintained by Customer.

(i) "**Force Majeure**" means any failure or delay in fulfilling or performing any term of this Agreement (except for any obligations to make payments to the other party hereunder), when and to the extent such failure or delay is caused by or results from the following force majeure events ("**Force Majeure Event(s)**"): (i) acts of God; (ii) flood, fire, earthquake, epidemics, pandemics or explosion; (iii) war, invasion, hostilities (whether war is declared or not), sabotage, terrorist threats or acts, riot or other civil unrest; (iv) government order or law; (v) actions, embargoes or blockades in effect on or after the

date of this Agreement; (vi) judicial restraint or other action by any governmental authority (including, without limitation, an inability to procure permits, licenses or authorizations from any local, state, or federal agency for any of the supplies, materials, accesses or services required to be provided by either Customer or Tantalus under this Agreement); (vii) national or regional emergency; (viii) strikes, labor stoppages or slowdowns or other industrial disturbances; (ix) shortage of adequate power or transportation facilities; and (x) other similar events beyond the reasonable control of the party impacted by the Force Majeure Event (the "**Impacted Party**").

(j) "**Initial Deployment Services**" means (i) Tantalus' standard services for initial deployment, installation and configuration of Tantalus Products purchased by Customer under this Agreement as described in a Statement of Work, executed in a form substantially similar to Exhibit G; (ii) Tantalus' standard initial training services for the Customer; and (iii) related project management for such initial deployment and training. For clarity, and notwithstanding anything to the contrary, the Initial Deployment Services do not include integration or installation of field equipment (i.e. meters, collectors, repeaters, etc.), Third-Party Products, or Maintenance and Support Services. Integration to existing vendor supported interfaces are included in the Initial Deployment Services. For the avoidance of doubt, custom services, including custom integration(s) between TUNet and Third-Party Products that are not existing vendor supported interfaces, are not included in the Initial Deployment Services and are subject to additional fees and written agreement between Tantalus, Customer and any applicable third-party in the form of a written Change Order.

(k) "**Law**" means any statute, law, ordinance, regulation, rule, code, constitution, treaty, common law, governmental order, or other requirement or rule of law of any governmental authority.

(l) "**Licensed Software**" means all Tantalus software and firmware residing on, or provided in connection with, each unit of Network Equipment, together with all software documentation related thereto and any and all updates thereto.

(m) "**Licensed Software Maintenance Services**" shall have the meaning ascribed to them in Exhibit A.

(n) "**Maintenance and Support Services**" means the recurring Licensed Software Maintenance Services and Technical Support provided by Tantalus to Customer pursuant to this Agreement.

(o) "**MNDCA**" means a Mutual Non- Disclosure and Confidentiality Agreement in the form attached hereto as Exhibit F.

(p) "**Network Equipment**" means the equipment manufactured by or for Tantalus for use as part of TUNet and its associated Licensed Software that are or will be purchased from Tantalus and physically deployed in the Customer's service territory. For clarity, Network Equipment does not include the system backhaul, network operations center, meters or any Third-Party Products.

(q) "**Proprietary Rights**" means all patent rights, copyrights, trademarks, tradenames, know-how, trade secrets and other intellectual property and proprietary rights, including all rights, interests, and protections that are associated with, equivalent or similar to, or required for the exercise of, any of the foregoing, however arising, in each case whether registered or unregistered and including all registrations and applications for, and renewals or extension of, these rights or forms of protection under the Laws of any jurisdiction throughout in any part of the world.

(r) "**Purchase Orders**" means purchase orders issued, from time to time, by Customer to Tantalus pursuant to which Customer will purchase and Tantalus will provide Network Equipment, Initial Deployment Services and Maintenance and Support Services in accordance with the terms of this Agreement. Each Purchase Order will be deemed to include the terms and conditions of this Agreement, even if not specifically stated on the Purchase Order.

(s) **"Representative"** means such Party's directors, officers, employees, agents, consultants, legal counsel, accountants and financial advisors of a Party to this Agreement.

(t) "**Shipping Point**" means the designated depot or depots in North America selected by Tantalus as its shipping point for Network Equipment.

(u) "**Specifications**" means the design, performance and regulatory requirements for each Network Equipment, as such may be amended from time to time by Tantalus, which Specifications will assume and require the installation, maintenance and operation of such Network Equipment in accordance with the Standards.

(v) "**Standards**" means the applicable industry standards necessary for the proper installation, maintenance and operation of Network Equipment and TUNet, as may be amended from time to time by Tantalus, including, without limitation, the maintenance of a distribution system meeting industry standards with respect to grounding and power quality and the use of water pits for the installation of Network Equipment that properly drain and are not otherwise defective.

(w) **"Statement of Work (SOW)"** means a

document that defines the scope of work to be completed, the timelines for the overall project, provides visibility into the interdependencies required, and will assist all parties in understanding and executing their respective roles, responsibilities and tasks to successfully deploy TUNet. Upon commencement of the Initial Deployment Services, Tantalus and Customer will work cooperatively to develop and finalize a Statement of Work consistent with the attached Exhibit G.

(x) **"System Acceptance Test Plan" or "SAT**" generally means a test designed to verify the functionality, accuracy and reliability of TUNet. Exhibit G, Statement of Work includes the System Acceptance Test Plan which outlines the features and functional areas of TUNet to be tested, provides a brief overview of the tests to be performed, and sets forth the success criteria associated with each test.

(y) **"Technical Support"** means the technical support services described in Exhibit B.

(z) **"Third-Party Product"** means any products, software, materials, information or services that is manufactured, provided and/or licensed by, or otherwise proprietary to a person or entity other than Tantalus. Use of Third-Party Products may be subject to additional terms and conditions.

(aa) "**TUNet**" means Tantalus' proprietary TUNet® smart grid network. For the avoidance of doubt, TUNet does not include Third-Party Products.

1.2 Interpretation Not Affected by Headings, etc. The division of this Agreement into sections and other portions and the insertion of headings are for convenience of reference only and shall not affect the construction or interpretation hereof.

1.3 Number, etc. Unless the context otherwise requires, words importing the singular shall include the plural and vice versa and words importing any gender shall include all genders.

1.4 Date for Any Action. In the event that any date on which any action is required to be taken hereunder by any of the Parties hereto is not a Business Day, such action shall be required to be taken on the next succeeding day which is a Business Day.

1.5 Construction. In this Agreement, unless otherwise indicated:

(a) the terms "this Agreement", "hereof", "herein", "hereunder" and "hereby" and similar expressions refer to this Agreement (including the schedules hereto), as amended or supplemented from time to time pursuant to the applicable provisions hereof, and not to any particular section or other portion hereof;

(b) the words "include", "including" or "in particular", when following any general term or statement, shall not be construed as limiting the general term or statement to the specific items or matters set forth or to similar items or matters, but rather as permitting the general term or statement to refer to all other items or matters that could reasonably fall within the broadest possible scope of the general term or statement;

(c) time is of the essence; and

(d) references to a "party" or "parties" are references to a Party or Parties to this Agreement.

1.6 Authorship. Authorship of this Agreement will have no bearing on the construction of any terms hereof or ambiguities thereof.

2. TERMS OF PURCHASE AND SALE

2.1 Purpose/Goal. This Agreement records the terms and conditions under which Customer will purchase from Tantalus, and Tantalus will provide to Customer, Network Equipment, Initial Deployment Services and Maintenance and Support Services, as the case may be, and includes, without limitation, the terms, conditions and responsibilities of each Party relating to the license and use of the Licensed Software, the provision of Technical Support and the deployment of TUNet and the non-disclosure obligations of the Parties. Notwithstanding anything to the contrary herein, Tantalus shall not be responsible for nor have any liability to Customer for any delay or failure to perform its obligations under this Agreement to the extent such delay or failure is caused by or results from an Excusing Event.

2.2 Purchase Orders. Customer may purchase Network Equipment by issuing properly authorized Purchase Orders to Tantalus at the prices set forth in Exhibit D Each type of Network Equipment may have an economic order quantity or minimum order quantity, meaning that no Purchase Order may be placed for a quantity of those units of Network Equipment which is less than the minimum number of units specified on the then current Tantalus price list and designated as the "economic order quantity" or "minimum order quantity". Each Purchase Order issued by Customer shall have a lead-time of at least 90 days. Lead-time means the time extending from the date the Purchase Order is received by Tantalus to the specified delivery date. Each Purchase Order shall reference this Agreement and shall state product description, quantity of Network Equipment ordered, part number, desired delivery date and Destination, method of shipment, unit price for each unit ordered and total purchase price. In the event of any inconsistency or

conflict between any terms of a Purchase Order, order confirmation, invoice or any other commercial form used by the Parties and this Agreement, the terms of this Agreement shall govern. No oral, electronic, or written additional or different provisions proposed by either Party in any acceptance, confirmation, or acknowledgment shall apply. Purchase Orders, once accepted, may not be cancelled, except as outlined in Section 2.3 below.

2.3 Acceptance, Rejection or Changes to Purchase Orders. Tantalus will notify Customer of its acceptance or rejection of each Purchase Order as soon as practicable and notice of acceptance shall include confirmation of requested quantities and prices consistent with the terms of this Agreement. Once a Purchase Order is accepted by Tantalus, the quantities and prices within that acceptance, unless otherwise noted on such acceptance, are committed to and cannot be changed without the consent of both Tantalus and Customer. If the Parties agree to changes to a Purchase Order, those changes will be incorporated in a replacement Purchase Order, which will follow the same process outlined above referencing the Purchase Order to be replaced.

2.4 Pricing.

(a) The prices set forth in Exhibit D for Network Equipment and Initial Deployment Services provided to Customer under this Agreement may contain promotional or one-time pricing. Future prices shall be as set forth on Tantalus' then current price list and do not include taxes.

(b) The price of Maintenance and Support Services shall be as set forth in Addendum B-2.

2.5 Customer will be responsible for and pay all applicable federal, state, municipal or other governmental sales use, excise, value-added taxes, occupational or other taxes, tariffs, duties and surcharges now in force or enacted in the future which are associated with the provision of Network Equipment, Initial Deployment Services and Maintenance and Support Services by Tantalus, excluding taxes on Tantalus' income generally.

2.6 Price Changes. Tantalus reserves the right, in its sole discretion, to revise the prices applicable to Network Equipment, Initial Deployment Services, and annual Maintenance and Support Services sold to Customer, upon thirty (30) days prior written notice to Customer, by whichever of the following is greater: (i) the immediately preceding year's percentage increase in the Consumer Price Index For All Urban Customers, All Cities Average, All Items (CPI-U"), as published by the Bureau of Labor Statistics, U.S. Department of Labor in the "Summary Data from the Consumer Price Index New Release" for the 12-month period ending at December 31st of the calendar year immediately preceding the adjustment date; or (ii) the average percentage change during the most recent 12-month period to Tantalus' published price list, or

(iii) 3.5% per year. Notwithstanding the foregoing, the original price of any Network Equipment, Initial Deployment Services and Maintenance and Support Services covered by Purchase Orders issued by the Customer, and which Purchase Orders are confirmed and accepted by Tantalus prior to the Effective Date of such price revision, will not be changed for such Purchase Orders issued and accepted as of the Effective Date.

2.7 Payment.

(a) Customer agrees to pay an advance payment (the "**Deposit**") equal to twenty-five percent (25%) of the total purchase price of the Network Equipment specified on each Purchase Order. The Deposit will be due and payable, notwithstanding the absence of the applicable Tantalus' invoice, within ten (10) days of the date of the Tantalus order acknowledgement issued in connection with an accepted Purchase Order. Failure to pay the Deposit by such due date shall result in the cancellation of the Purchase Order by Tantalus, without requirement for any further action, or notice to Customer, by Tantalus. Notwithstanding the foregoing, if Customer places a single blanket Purchase Order that is at least 12 months in duration and represents greater than thirty percent (30%) of their total customer base, the Deposit amount will be reduced to ten percent (10%) on that Purchase Order and subsequent Purchase Orders that are also at least 12 months in duration and represent greater than thirty percent (30%) of their total customer base.

(b) Tantalus shall invoice Customer for Network Equipment purchased upon delivery of such Network Equipment to Customer at the Shipping Point. Amounts paid under Section 2.6 (a) will be reflected as a credit to the total purchase price due and owing upon delivery completion of the total Purchase Order.

(c) Tantalus shall issue periodic invoices to Customer for all Maintenance and Support Services and Third-Party Products, as applicable, in accordance with the terms set forth on Addendum B-2 as fees for such goods and services are incurred.

(d) Payment terms are net thirty (30) days from date of Tantalus' invoice. All payments shall be in U.S. dollars, unless otherwise agreed to between Tantalus and Customer.

(e) In addition to any other remedies Tantalus may have for late payments, Customer will be charged interest at 1½% per month (equivalent to an annual rate of interest of 18%), payable monthly on all overdue amounts. Customer shall also be responsible for collection costs

associated with the late payment, if any, including reasonable attorney's fees. Payments will be applied first to interest payable and then principal owing. Tantalus may modify the preceding payment terms if, in its reasonable opinion, the payment record or financial condition of Customer so justifies.

(f) Tantalus shall invoice Customer and Customer shall pay for Maintenance and Support Services and Initial Deployment Services as described in Exhibit A, Exhibit B and Exhibit D.

2.8 Delivery/Title/Risk of Loss. Tantalus shall deliver the Network Equipment to Customer at the Shipping Point (cleared for export, if applicable) and title (other than title to Licensed Software which shall remain with Tantalus) and risk of loss of Network Equipment shall pass from Tantalus to Customer at the Shipping Point. If any loss of or damage to the Network Equipment occurs prior to delivery to Customer, regardless of passage of title prior to such delivery, Tantalus shall without cost to the Customer, promptly make all repairs or replacements necessary to place the Network Equipment in the condition required by this Agreement. Customer will notify Tantalus within five (5) days of delivery of any damage to Network Equipment and/or within 10 days of shipping should an order not be received. If the Shipping Point and Destination are not the same, Customer shall be responsible for and shall pay all transportation and insurance costs for Network Equipment from the Shipping Point to the Destination, provided however that upon request by Customer, Tantalus shall make the arrangements for such transportation and insurance and will invoice Customer for reimbursement at cost. The payment terms described in Section 2.6 shall apply to such invoices, mutatis mutandis. Delivery dates are approximate only. Tantalus shall notify Customer in writing, if Tantalus has knowledge of any event that is reasonably likely to materially delay any specified delivery date or change any specified delivery date.

2.9 Third-Party Products. Customer may elect to use the Third-Party Products as set forth in Exhibit E. Except as expressly set forth on Exhibit E and unless otherwise specifically set forth in writing (and subject to applicable pass-through terms and conditions) upon mutual agreement of all involved Parties, Tantalus does not warrant Third-Party Products and disclaims all responsibility and liability for these items, their access to the Network Equipment and TUNet, including their modification, deletion, disclosure or collection of Customer information.

2.10 Insurance. During all times in which Customer has possession of Network Equipment for which Tantalus has not received payment in full, Customer shall ensure that comprehensive general liability insurance with limits at least equal to the total value of all such Network Equipment is obtained and, upon request, provide Tantalus with a certificate evidencing such coverage.

2.11 Changes to Network Equipment. Tantalus reserves the right from time to time in its sole discretion to modify, change, discontinue or to limit its production of any Network Equipment at any time to allocate, terminate or limit deliveries of any Network Equipment in time of shortage and to alter the design or construction of any Network Equipment.

2.12 No Resell. Customer acknowledges and agrees that it has no rights to market and resell the Network Equipment, Initial Deployment Services or Maintenance and Support Services. The purchase and sale of Network Equipment, Initial Deployment Services and Maintenance and Support Services hereunder is solely for Customer and its Affiliates' requirements.

3. CONFIDENTIAL INFORMATION

3.1 Mutual Non-Disclosure and Confidentiality Agreement. The Parties have entered into the MNDCA in the form attached hereto as Exhibit F. Tantalus and Customer agree that the MNDCA governs the obligations of each Party with respect to Confidential Information of the other Party, which obligations shall survive termination of this Agreement.

4. WARRANTIES

4.1 Warranties.

(a) With respect to new Network Equipment, for a period of one (1) year from the date of shipment of each unit of Network Equipment to Customer from Shipping Point, Tantalus warrants that: (i) each unit of Network Equipment will be free from defects in material, workmanship and manufacture under normal use and service, (ii) title to each unit of Network Equipment shall be free and clear of all liens, financial encumbrances and security interests, (iii) all materials, parts, components and other items initially incorporated in the Network Equipment will be new; and (iv) each unit of Network Equipment shall be compliant with, and perform in accordance with its Specifications. The warranty for replaced or repaired Network Equipment originally warranted under this Section shall be thirty (30) days from date of return to Customer or the balance of the original warranty period, whichever is greater.

(b) With respect to refurbished Network Equipment, for a period of thirty (30) days from the date of shipment of refurbished Network Equipment to Customer from Shipping Point, Tantalus warrants that: (i) each unit of refurbished Network Equipment will be free from

defects in material, workmanship and manufacture under normal use and service, (ii) title to each unit of refurbished Network Equipment shall be free and clear of all liens, financial encumbrances and security interests; and (iii) each unit of refurbished Network Equipment shall be compliant with, and perform in accordance with its Specifications.

(c) The aforementioned warranties in Sections 4.1(a) and 4.1(b) apply only when all three of the following conditions prevail: (i) the unit of Network Equipment is owned by the original Customer and not by an assignee; (ii) the Customer is not the subject of bankruptcy or comparable proceedings; and (iii) while there is not an Excusing Event in effect or Tantalus has not invoked a subsisting remedy in respect of Force Majeure.

(d) The aforementioned warranties in Sections 4.1(a) and 4.1(b) will not apply to Licensed Software which is sold "as is" with no warranty, in accordance with Exhibit A.

(e) The aforementioned warranties in Sections 4.1 (a) and 4.1(b) will not cover any Third-Party Products provided by Tantalus or Third-Party Products provided to Customer by third-party suppliers. Any warranty for such products will be between Customer and the third-party manufacturer or supplier. To the fullest extent allowed, Tantalus will assign all third-party warranties to Customer.

4.2 Warranty Returns.

(a) Subject to Section 4.2(b) below, for any breach of warranty under Sections 4.1(a) or (b), Tantalus' sole obligation shall be to, at its sole option and expense, repair or replace defective Network Equipment or refund the purchase price thereof, within 60 days of receipt of such defective Network Equipment at its designated depot, provided that the Customer has returned the defective Network Equipment to Tantalus no later than four weeks after the expiry of the applicable warranty period set out in Section 4.1. Customer will be responsible for removing defective Network Equipment from the installation point and returning the defective Network Equipment, transportation charges prepaid by Customer, to Tantalus at its designated depot, together with Tantalus' return material authorization number ("**RMA**") and completed problem sheet. Tantalus will be responsible for paying all shipping and other costs incidental to the return of repaired or replacement Network Equipment to Customer. Customer will be responsible for re-installing such repaired or replacement Network Equipment.

(b) To the extent Tantalus determines that the Network Equipment returned under warranty is not defective (that is, no fault found), Customer will pay for the return of the Network Equipment and will pay Tantalus the fee of US $150 per no fault found Network Equipment.

(c) Tantalus will make available out-of- warranty repairs in accordance with its programs in effect at the relevant time. Services for out-of-warranty repairs will be provided at Tantalus' then current time and materials fees and rates.

4.3 No Warranty. The warranties described in Section 4.1 will not cover Network Equipment:

(a) units whose original bar code, copyright notices and proprietary legends, if any, have been altered;

(b) units that were not installed or de- installed in accordance with the Specifications and Standards or serviced by Tantalus or a person authorized by Tantalus to do so;

(c) units damaged or defective because of reasonable wear and tear;

(d) units that were not maintained and operated in accordance with the Specifications and Standards, including, without limitation, units damaged or defective because of problems with electrical power;

(e) units that in Tantalus' reasonable opinion have been misused, altered, abused or subject to abnormal conditions of operation or handling; and

(f) units damaged or defective due to an Excusing Event.

4.4 DISCLAIMER. TANTALUS DISCLAIMS ALL OTHER REPRESENTATIONS, WARRANTIES AND CONDITIONS, EXPRESS OR IMPLIED OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OF OTHER'S INTELLECTUAL PROPERTY RIGHTS EXCEPT AS PROVIDED IN ARTICLE 5 BELOW AND DURABILITY.

5. LIABILITY AND INDEMNITY

5.1 Relief for patent and copyright matters. Tantalus, at its expense, shall defend any court suit brought against Customer by a third party alleging that units of Network Equipment purchased by Customer infringe US or Canadian patent or copyright ("**IP Right**"). Tantalus' obligation to defend is effective only if Customer is not in breach of any of the terms and conditions of this Agreement and of any other agreement between the Parties, and if Tantalus is notified promptly and given complete information, assistance and authority by Customer to conduct the defense. If any unit of Network Equipment: (a) is adjudicated by a court of competent

jurisdiction after appeals therefrom are exhausted, as infringing any IP Right or (b) has its use enjoined by such court, Tantalus will, at its election: (i) procure for the Customer the right to continue using said unit; (ii) replace it with non-infringing and functional equivalent unit; (iii) modify it to become non- infringing; or (iv) if none of the aforementioned options are reasonably available, refund to Customer all amounts paid for the infringing Network Equipment, depreciated on a straight line basis over a ten (10) year period. Tantalus' obligation to defend includes the sole right to settle. Tantalus' obligation to defend does not apply to the following: (A) Network Equipment based on a design, specification or instructions supplied or requested by Customer; (B) use of Network Equipment in combination with any other hardware or software not provided by Tantalus, if infringement would not have occurred but for such combination; (C) use of any release of Licensed Software or any firmware other than the most current release made available to Customer; (D) use of Network Equipment other than as permitted under this Agreement, or as intended by Tantalus, if the infringement would not have occurred but for such use; or (E) modifications made to Network Equipment not made by Tantalus or approved by Tantalus. The foregoing states Tantalus' entire liability with respect to intellectual property infringement by any unit of Network Equipment. For the avoidance of doubt, Tantalus shall not have any liability hereunder relating to or arising from Third-Party Products.

5.2 General Indemnity. Tantalus shall defend, indemnify and hold Customer harmless from all loss, expense or damages (including without limitation, reasonable attorney's fees) which may be incurred by Customer as a result of any claims or actions resulting from: (a) damage to tangible personal property owned by Customer and caused by the gross negligence of Tantalus; and (b) death of or bodily injury to a Customer employee or third party to the extent caused by Tantalus' gross negligence. Customer will provide Tantalus with prompt, written notice of any claim covered by this indemnification. Unless Tantalus fails to defend Customer, Customer shall not undertake the defense of any such claim. Tantalus, at its sole expense, shall defend all such claims and actions against Customer, whether brought informally or through court or administrative procedures. For the avoidance of doubt, Tantalus shall not have any liability hereunder relating to or arising from Third-Party Products.

5.3 Customer Indemnity. The relationship of Tantalus and Customer established by this Agreement is that of independent contractors and neither Party is an employee, agent or joint venture of the other. All financial obligations associated with Customer's business are the sole responsibility of Customer. Customer shall indemnify, defend and hold harmless Tantalus from and against any and all claims, liabilities, damages, debts, settlements, costs, attorneys' fees, expenses and liabilities of any type whatsoever that may arise on account of Customer's activities, or those of its Representatives, including, without limitation, (i) all sales and use taxes and similar charges arising in connection with the purchase of Network Equipment, Initial Deployment Services and Maintenance and Support Services hereunder and all other federal, state and municipal taxes, interest, fines and penalties arising in connection with Customer's business activities and (ii) those relating to Customer's use of the Network Equipment and TUNet or Customer's breach of any term, representation or warranty of this Agreement.

5.4 Limitation of Liability.
NOTWITHSTANDING ANY OTHER PROVISION TO THE CONTRARY, OTHER THAN FOR GROSS NEGLIGENCE, WILLFUL MISCONDUCT OR FRAUD, NEITHER PARTY WILL BE LIABLE TO THE OTHER FOR ANY (I) SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR LOSSES INCLUDING, WITHOUT LIMITATION, LOSS OR CORRUPTION OF DATA, LOSS OF REVENUE, SAVINGS OR PROFITS, CLAIMS BY USERS AND THIRD PARTIES, LOSS OF GOODWILL, BUSINESS INTERRUPTION OR OTHER PECUNIARY LOSS WHETHER ARISING FROM BREACH OF WARRANTY OR CONDITION, BASED ON CONTRACT, TORT, RELIANCE, FUNDAMENTAL BREACH, STATUTE, OR ANY OTHER THEORY, AND EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES; OR (II) COST OF PROCUREMENT OF SUBSTITUTE GOODS, TECHNOLOGY OR SERVICES. NOTWITHSTANDING ANYTHING ELSE IN THIS AGREEMENT AND WITHOUT LIMITING THE FOREGOING, TANTALUS WILL NOT BE LIABLE WITH RESPECT TO ANY SUBJECT MATTER OF THIS AGREEMENT UNDER ANY CONTRACT, NEGLIGENCE, CIVIL LIABILITY, TORT, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR: (A) ANY AMOUNTS IN EXCESS OF THE AGGREGATE AMOUNTS PAID TO TANTALUS FOR NETWORK EQUIPMENT, INITIAL DEPLOYMENT SERVICES AND MAINTENANCE AND SUPPORT SERVICES GIVING RISE TO SUCH LIABILITY IN THE TWELVE (12) MONTH PERIOD IMMEDIATELY PRECEDING THE CLAIM ; (B) ANY FAILURE OR DELAY DUE TO AN EXCUSING EVENT; OR (C) ANY ALLOCATION OF NETWORK EQUIPMENT, INITIAL DEPLOYMENT SERVICES AND MAINTENANCE AND SUPPORT SERVICES AMONG ITS CUSTOMERS IN THE EVENT OF A

SHORTAGE. LIMITATIONS OF LIABILITY WILL NOT BE ASSERTED TO THE EXTENT PROHIBITED BY RELEVANT LAWS AND POLICIES. TANTALUS' PRICING REFLECTS THIS ALLOCATION OF RISKS AND THE LIMITATION OF LIABILITY.

6. OWNERSHIP OF INTELLECTUAL PROPERTY

6.1 Ownership of Intellectual Property. Except for licenses otherwise expressly granted under this Agreement, nothing hereunder conveys to Customer any Proprietary Rights in TUNet and Customer acknowledges Tantalus' exclusive rights thereto. This Agreement will not be construed to grant to Customer, either expressly, by implication or by way of estoppel, any license under any other Proprietary Rights of Tantalus covering or relating to any product or invention of Tantalus, or any combination of TUNet with any other product of Tantalus.

7. TERM AND TERMINATION

7.1 Term. Unless terminated earlier as provided herein, this Agreement shall have an initial term of one (1) year commencing on the execution date of this Agreement (Initial Term) Thereafter, the Agreement will automatically renew for successive one (1) year periods thereafter, unless terminated in accordance with the terms of this Agreement.

7.2 Termination.

(a) Either Party may terminate this Agreement effective upon the delivery of written notice of such termination to the other Party, if the other Party:

(i) becomes insolvent, is generally not paying its debts as such debts become due, makes an assignment for the benefit of creditors, is the subject of any voluntary or involuntary case commenced under the federal bankruptcy laws, as now constituted or hereafter amended (which, in the case of involuntary bankruptcy, is not dismissed within 30 days), or of any other proceeding under other applicable laws of any jurisdiction regarding bankruptcy, insolvency, reorganization, adjustment of debt or other forms of relief for debtors, has a receiver, trustee, liquidator, assignee, custodian or similar official appointed for it or for any substantial part of its property, or is the subject of any dissolution or liquidation proceeding; breaches its obligations related to confidentiality; or

(ii) is in default in any material respect in the performance of any its obligations under of this Agreement, provided that the Party not at fault has given the other Party forty five (45) days prior written notice of such default and such other Party has not remedied the default during such 45-day cure period; provided however if the defaulting Party is Customer and such default is attributable to or includes Customer's failure to pay any amount when due, then the aforementioned 45-day cure period will be reduced to five (5) days.

(b) Either Party may terminate this Agreement, at any time and for any reason, on ninety (90) days' prior written notice to the other Party, provided however that if terminated by Customer, Tantalus shall take commercially reasonable efforts to cancel any deliveries to Customer which are scheduled to be made after the termination date. Customer shall be responsible for all amounts due to Tantalus arising prior to the termination date, including the cost of Network Equipment received by Customer prior to such termination date or that has been shipped within 45 days following the date of the notice of termination and any fees for Maintenance and Support Services for the period prior to the effective date of such termination.

(c) Prior to the effective termination of this Agreement, all of the terms and conditions of, and the respective rights and obligations of the Parties to, this Agreement will remain completely valid and enforceable; provided however that, in the event Tantalus terminates the Agreement under Section 7.2(a), then any deliveries of Network Equipment, Initial Deployment Services and Maintenance and Support Services to Customer which are scheduled to be made subsequent to the effective date of termination shall be cancelled and any product warranties or guarantees hereunder shall be terminated and of no further force and effect.

7.3 Other Remedies. Termination is not the sole remedy available under Section 7.2(a) of this Agreement and, whether or not termination is effected; all other legal remedies will remain available.

7.4 Survival. Notwithstanding anything to the contrary in this Agreement, no expiration or termination of this Agreement by either Party shall affect any rights or obligations of either Party: (i) which are vested pursuant to this Agreement as of the effective date of such expiration or termination, (ii) any other provisions intended by the Parties to survive such expiration or termination including, but not limited to, the non-disclosure obligations set forth in the MNDCA.

8. DISPUTE RESOLUTION

8.1 Dispute Resolution. Except for Disputes related to nonpayment or as otherwise provided in this Section, neither Party shall resort to formal litigation proceedings until the Parties have attempted to resolve the Dispute through non-binding mediation. The Party raising a Dispute shall submit to the other Party a written notice and supporting material describing all issues and circumstances related to the Dispute (a "**Dispute Notice**"). A designated

senior management representative of each Party shall attempt to resolve the Dispute. If the Parties' Representatives fail to resolve the Dispute within thirty (30) days from receipt of a Dispute Notice, the Dispute shall be referred to a mediator in the jurisdiction provided for in Section 9.5 of this Agreement as mutually agreed between the Parties. The Parties covenant that they will use commercially reasonable efforts in participating in the mediation. The Parties agree that the mediator's fees and expenses and the costs incidental to the mediation will be shared equally between the parties. The Parties further agree that all offers, promises, conduct, and statements, whether oral or written, made in the course of the mediation by any of the Parties, their agents, employees, experts, and attorneys, and by the mediator and any employees of the mediation service, are confidential, privileged, and inadmissible for any purpose, including impeachment, in any litigation, arbitration or other proceeding involving the parties, provided that evidence that is otherwise admissible or discoverable shall not be rendered inadmissible or non- discoverable as a result of its use in the mediation. If the Parties cannot resolve any Dispute for any reason, including, but not limited to, the failure of either party to agree to enter into mediation or agree to any settlement proposed by the mediator, within thirty (30) days after the later of the referral to a mediator or the mediation proceeding, either Party may file suit in a court of competent jurisdiction in accordance with the provisions of Section 9.5 of this Agreement. This Agreement shall not be construed to prevent a Party from instituting litigation proceedings earlier than as indicated in this Agreement to:

(a) avoid the expiration of any applicable limitations period,

(b) preserve a superior creditor position or (c) seek injunctive relief to prevent irreparable harm, including without limitation, harm caused by a breach of confidentiality obligations.

9. GENERAL PROVISIONS

9.1 Notices. All notices under this Agreement shall be made in writing and shall be deemed properly delivered when: (a) delivered personally, (b) sent by e-mail to the address below, delivery confirmation required, (c) mailed by certified mail, postage prepaid or overnight delivery service to the address of the other Party set forth below, or (d) sent by facsimile (provided confirmation of delivery is obtained at the time of transmission). Notices shall be effective upon receipt.

Communications must be addressed to the Parties as follows:

If to Tantalus:
Peter A. Londa, President & CEO Tantalus Systems Inc.
1130 Situs Court, Suite 230
Raleigh, NC 27606
Facsimile: (919) 900-8978
E-mail: legal_dept@tantalus.com

If to Customer:

Facsimile:
E-mail:

Unless expressly set out to the contrary herein, consent or approval that is explicitly required herein of a Party hereto will not be unreasonably delayed, withheld or withdrawn by it.

Either Party may change the address for service by giving 15 days' advance written notice to the other Party.

9.2 Severability. If any term or other provision of this Agreement is invalid, illegal or incapable of being enforced by any rule or Law, all other conditions and provisions of this Agreement shall nevertheless remain in full force and effect so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner materially adverse to any Party. Upon such determination that any term or other provision is invalid, illegal or incapable of being enforced, the Parties hereto shall negotiate in good faith to modify this Agreement so as to effect the original intent of the Parties as closely as possible in an acceptable manner to the end that transactions contemplated hereby are fulfilled to the extent possible.

9.3 Entire Agreement. This Agreement together with the Exhibits attached hereto constitute the sole and entire agreement between the Parties on the subject matter hereof, and supersedes and invalidates all other commitments, representations, warranties, conditions and understanding relating to the subject matter hereof.

9.4 Amendment and Waiver. No amendment or waiver of any provision of this Agreement shall be effective unless it is in writing and signed by the Party against which it is sought to be enforced. No waiver by any Party or any breach or series of breaches in performance by the other Party, and no failure, refusal or neglect to exercise any right, power or option given to either Party to insist upon strict compliance with or performance of the obligations hereunder, will constitute a waiver of the provisions hereof with respect to any subsequent breach thereof or a waiver by such Party of its

right at any time thereafter to require strict compliance with the provisions hereof.

9.5 Governing Law. This Agreement shall be governed by, and construed under, the laws of the State of Delaware without regard to conflicts of law provisions thereof and without regard to the United Nations Convention on Contracts for the International Sale of Goods. Tantalus and Customer:

(a) agree that any suit, action or other legal proceeding arising out of or relating to this Agreement must be brought in either the United States District Court for the District of Delaware or the Commercial Division of the State Court of Delaware, which Court will have exclusive jurisdiction over any controversy arising out of this Agreement;

(b) consent to the jurisdiction of such Court in any such suit, action or proceeding;

(c) unconditionally waive any objection which it may have to the laying of venue of any such suit, action or proceeding in such Court and claim that any such suit, action or proceeding has been brought in an inconvenient forum; and

(d) unconditionally waive a trial by jury in any such suit, action or proceeding.

9.6 Force Majeure. No default, delay or failure to perform on the part of either Party shall be considered a breach of this Agreement where such default, delay or failure is due to a Force Majeure. Lack of funds or credit will not constitute a Force Majeure. In the event of a Force Majeure, the Impacted Party shall promptly give notice of the Force Majeure Event to the other party, stating the period of time the occurrence is expected to continue. The Impacted Party shall use diligent efforts to end the failure or delay and ensure the effects of such Force Majeure Event are minimized. The Impacted Party shall resume the performance of its obligations as soon as reasonably practicable after the removal of the cause.

9.7 Compliance with Laws. Each Party shall, at its own cost and expense, comply with all applicable Laws relating to the subject matter of this Agreement.

9.8 Successors and Assigns. This Agreement binds, and inures to the benefit of, the Parties and their respective successors. This Agreement shall not be assigned by either Party without the prior written consent of the other Party, except that Customer agrees that Tantalus may assign, without notice to Customer, any account receivable arising under this Agreement in connection with a factoring arrangement.

9.9 Further Assurance. Each Party undertakes with the other Party that it will execute such documents and do such acts and things as that other Party may reasonably require for the purpose of giving to that other Party the full benefit of the provisions of this Agreement.

9.10 Execution in Counterparts and by Facsimile. This Agreement may be executed in one or more counterparts, all of which shall be considered one and the same agreement and shall become effective when one or more counterparts have been signed by each of the Parties and delivered to the other Parties. This Agreement may be executed and delivered electronically or by facsimile and the Parties agree that such facsimile or electronic execution and delivery shall have the same force and effect as delivery of an original document with original signatures, and that each Party may use such facsimile or electronic signatures as evidence of the execution and delivery of this Agreement by all Parties to the same extent that an original signature could be used.

[SIGNATURES ON NEXT PAGE]

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized Representatives as of the date and year set out in page 1.

Tantalus Systems Inc. _____

By: _____ By: _____

Name: _____ Name: _____

Title: _____ Title: _____

EXHIBIT A

END USER LICENSE AGREEMENT

This End User License Agreement (the "**EULA**") is effective as of_____between **Tantalus Systems Corp.**, a Canadian corporation, with a primary business address of 3555 Gilmore Way, Suite 200, Burnaby, BC V5G 0B3 Canada ("**Tantalus**") on behalf of itself and its Affiliates, and_____with a primary business address of_____("**Customer**").

ARTICLE I

All Tantalus software and firmware residing on, or provided in connection with, each unit of Network Equipment, together with all software documentation related thereto and any and all updates thereto (the **"Licensed Software"**), which excludes third-party software products that have their own end user license terms, is subject to the terms and conditions of this EULA. THIS EULA IS A LEGALLY BINDING CONTRACT BETWEEN CUSTOMER AND TANTALUS AND SETS FORTH THE TERMS AND CONDITIONS THAT GOVERN CUSTOMER'S USE OF THE LICENSED SOFTWARE. BY INSTALLING OR USING ALL OR ANY PORTION OF THE LICENSED SOFTWARE, CUSTOMER ACCEPTS ALL THE TERMS AND CONDITIONS STATED OR REFERENCED IN THIS EULA. IF CUSTOMER IS UNABLE OR UNWILLING TO ENTER INTO AND COMPLY WITH THE TERMS AND CONDITIONS OF THIS EULA, OR IF THIS EULA TERMINATES FOR ANY REASON, CUSTOMER MUST NOT INSTALL OR USE THE LICENSED SOFTWARE AND SHALL IMMEDIATELY RETURN TO TANTALUS THE TANTALUS PRODUCT ON WHICH THE LICENSED SOFTWARE RESIDES AND/OR IS USED.

GRANT OF LICENSE. The Licensed Software is licensed, and not sold, for use by the legal entity entering into this EULA and only in accordance with the terms of this EULA. Subject to the terms and conditions of this EULA and any limitations imposed as part of a special beta test, trial, or promotional program, Tantalus hereby grants to Customer a limited, non-exclusive, non-transferable license to use the Licensed Software solely for its internal business operations in conjunction with the application package purchased from Tantalus by Customer, for operation in Tantalus approved application environments, and in strict accordance with third-party license conditions, if any, or as otherwise set forth by Tantalus in writing if not set forth under the terms of this EULA, and Tantalus reserves all other rights.

RESTRICTIONS ON USE. Unless expressly permitted by Article I of this EULA, or otherwise by applicable law or by Tantalus in writing, Customer shall not: (i) reproduce, modify, adapt, translate, update or transmit the Licensed Software, in whole or in part; provided, however that Customer may temporarily transfer the Licensed Software from one physical device to another in the event of a computer malfunction; (ii) rent, lease, license, assign, give, transfer, or otherwise provide access or distribute the program or rights to the Licensed Software to another entity; (iii) use, alter, remove, or cover trademarks or proprietary notices of Tantalus or any third-party on the Licensed Software; (iv) directly or indirectly export, import or transmit the Licensed Software, or any direct product thereof, to any country in contravention of the laws of that country or the laws of the United States or Canada; (v) use the Licensed Software except in Tantalus approved application environment(s); (vi) decompile, disassemble, decrypt, unbundle, extract or otherwise attempt or assist others to reverse engineer the Licensed Software, except as necessary, when permitted by applicable law, to correct defects or achieve interoperability with complimentary programs, for Customer's purposes only, but only if Customer has subscribed for, and paid all applicable fees relating to, the Licensed Software Maintenance Services and Tantalus has refused to provide such Licensed Software Maintenance Services; (vi) use the Licensed Software for rental, timesharing, subscription service, hosting or outsourcing; (vii) make the Licensed Software available in any manner to any third-party for use in the third-party's business operations (except that Customer may permit its customers to use the Licensed Software only in furtherance of interactions between the Customer and its customers as expressly permitted by Tantalus); (viii) use the Licensed Software to provide third-party training; (ix) disclose results of any Licensed Software benchmark tests without Tantalus or its third-party supplier's prior written consent; (x) duplicate the Licensed Software, except for a sufficient number of copies as permitted by Article I of this EULA, or any documentation; or (xi) publish any results of any benchmarks or similar tests performed on the Licensed Software.

Use of the Licensed Software is limited to Customer, along with its approved agents or contractors (including, without limitation, outsourcers, if applicable) on Customer's behalf for Customer's internal business operations, subject to the terms of Article I of this EULA. Customer shall be responsible for its agents', contractors', outsourcers', customers' and members' use of the Licensed Software and compliance with this EULA.

Unless otherwise agreed between Customer and Tantalus, Tantalus has no obligation to provide maintenance, updates, fixes, support, or training for the Licensed Software.

THIRD-PARTY TECHNOLOGY. Customer acknowledges and agrees that certain third-party technology, as indicated in the documentation or otherwise communicated by Tantalus, may be provided for use with the Licensed Software. Customer shall

have the right to use third-party technology only with the Licensed Software and in accordance with the terms of any such third-party license agreement specified in the documentation or otherwise provided by Tantalus to Customer.

EXPORT RESTRICTIONS. Export laws and regulations of Canada and the United States and any other relevant local export laws and regulations apply to the Licensed Software. Customer agrees that such export control laws govern Customers use of the Licensed Software (including technical data) and Customer agrees to comply with all such export laws and regulations (including "deemed export" and "deemed re-export" regulations). Customer agrees that no data, information and/or Licensed Software will be exported, directly or indirectly, in violation of these laws, or will be used for any purpose prohibited by these laws including, without limitation, nuclear, chemical, or biological weapons proliferation, or development of missile technology. Customer represents and warrants that: (i) Customer is not located in a country that is subject to a U.S. Government embargo, or that has been designated by the U.S. Government as a "terrorist supporting" country; and (ii) Customer is not listed on any U.S. Government list of prohibited or restricted parties.

OWNERSHIP. The Licensed Software is protected by Canadian, United States, and international copyright and intellectual property laws. All rights to the Licensed Software are owned by Tantalus, its Affiliates or third-party suppliers, and Tantalus, its Affiliates, or third-party suppliers retain all rights, title, and interest in and to the Licensed Software including, without limitation, the source code, object code and any related information and documentation that may be provided as part of standard shipment(s) of Licensed Software. By acquiring a license to use the Licensed Software, Customer does not become the owner of the Licensed Software or receive any interest in the Licensed Software, and Customer has only limited license rights to use the Licensed Software, source code, object code and related information and documentation in accordance with the terms of this EULA. Furthermore, Customer may not assign, give, or transfer any interest in the Licensed Software to any third party. This section shall survive the termination or expiry of this EULA.

AUDITS. Tantalus shall have the right, upon reasonable request, to audit the systems and records of Customer necessary to verify Customer's compliance with this EULA. Customer shall provide reasonable assistance and access to information necessary to complete the audit. Customer acknowledges and agrees that Tantalus may report the audit results to its third-party suppliers, as applicable, and such third-party suppliers may audit Customer directly. Customer acknowledges and agrees that Tantalus or its third-party suppliers, as applicable, shall not be responsible for any costs incurred by Customer in cooperating with audits under this section.

UNIFORM COMPUTER INFORMATION TRANSACTIONS ACT (UCITA). For clarity, Tantalus and Customer acknowledges and agrees that the provisions of the Uniform Computer Information Transactions Act (UCITA) do not apply to this EULA.

LIMITED WARRANTY. For a period of one (1) year from the date of shipment of Network Equipment from the designated depot or depots in North America selected by Tantalus as its shipping point for Network Equipment. ("**Shipping Point**"), the physical media on which the Licensed Software is recorded by Tantalus will be free from defects in materials and workmanship under normal use. If failure of such physical media has resulted from accident, abuse or misapplication, Tantalus will have no responsibility to replace the physical media or refund any portions of the amount paid by Customer for the Licensed Software thereon. This limited warranty on the physical media from Tantalus on which the Licensed Software is recorded applies only when all three of the following conditions prevail: (a) such physical media is used in accordance with Article I of this EULA by the original customer and not by an assignee; (b) Customer is not the subject of bankruptcy or comparable proceedings; and (c) while Tantalus has not invoked a subsisting remedy in respect of Force Majeure or there is not an Excusing Event (as such term is defined in that certain TUNet Network System Agreement dated as of _____ by and between Tantalus and Customer) in effect at such time.

CUSTOMER'S SOLE REMEDY. Tantalus and its Affiliates', suppliers', agents', officers' and directors' entire liability and Customer's sole remedy under this EULA for defects or failure of the Licensed Software shall be, at Tantalus' option from time to time exercised subject to applicable law, repair or replacement of the physical media that does not meet this limited warranty. This limited warranty is void if failure of the physical media has resulted from accident, abuse, misapplication, abnormal or improper use, a virus or use in contravention of this EULA. Any replacement physical media will be warranted for the remainder of the original limited warranty period or thirty days (30) days, whichever is longer.

LIMITATION OF REMEDIES. TO THE EXTENT NOT PROHIBITED BY LAW, TANTALUS HEREBY DISCLAIMS ALL EXPRESS OR IMPLIED REPRESENTATIONS, WARRANTIES, GUARANTEES, AND CONDITIONS OF ANY KIND, ARISING BY LAW OR OTHERWISE, WITH REGARD TO THE PROGRAM, INCLUDING BUT NOT LIMITED TO REPRESENTATIONS, WARRANTIES, GUARANTEES, AND CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NONINFRINGEMENT, AND QUALITY OF SERVICE. TANTALUS MAKES NO REPRESENTATIONS OR WARRANTIES REGARDING THE CONTENT, EFFECTIVENESS, USEFULNESS, RELIABILITY, AVAILABILITY, TIMELINESS, QUALITY, SUITABILITY, ACCURACY OR COMPLETENESS OF THE SOFTWARE OR THE RESULTS CUSTOMER MAY OBTAIN BY USING THE PROGRAM OR THAT THE PROGRAM

WILL BE UNINTERRUPTED OR ERROR-FREE OR THAT IT IS COMPLETELY SECURE. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, TANTALUS DOES NOT REPRESENT OR WARRANT THAT (A) THE OPERATION OR USE OF THE PROGRAM WILL BE TIMELY, SECURE, UNINTERRUPTED OR ERROR-FREE; OR (B) THE QUALITY OF ANY PRODUCTS, SERVICES, INFORMATION OR OTHER MATERIAL CUSTOMER PURCHASES OR OBTAINS THROUGH THE PROGRAM WILL MEET CUSTOMER'S REQUIREMENTS. CUSTOMER ACKNOWLEDGES THAT TANTALUS DOES NOT CONTROL THE TRANSFER OF DATA OVER COMMUNICATIONS FACILITIES, INCLUDING THE INTERNET, AND THAT THE PROGRAM MAY BE SUBJECT TO LIMITATIONS, DELAYS, AND OTHER PROBLEMS INHERENT IN THE USE OF SUCH COMMUNICATIONS FACILITIES. TANTALUS IS NOT RESPONSIBLE FOR ANY DELAYS, DELIVERY FAILURES, OR OTHER DAMAGE RESULTING FROM SUCH PROBLEMS. EXCEPT WHERE EXPRESSLY PROVIDED OTHERWISE BY TANTALUS, THE PROGRAM IS PROVIDED TO CUSTOMER ON AN "AS IS" BASIS.

IN NO EVENT SHALL TANTALUS OR ITS THIRD PARTY SUPPLIER(S) BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, OR DAMAGES FOR LOSS OF PROFITS, GOODWILL, BUSINESS OPPORTUNITY, REVENUE, DATA OR DATA USE, INCURRED BY CUSTOMER OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT OR TORT OR OTHERWISE, ARISING FROM OR RELATED TO THE USE OF THE SOFTWARE OR ANY DATA DERIVED THEREFROM, EVEN IF TANTALUS HAD BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

THIRD PARTY BENEFICIARY. Oracle Canada ULC, along with any other third party that Tantalus may indicate in writing to Customer, shall be a third-party beneficiary of this EULA.

ARTICLE II

TERM, TERMINATION AND SURVIVAL. This EULA shall remain in effect until terminated by either Party upon ten. (10) Business Days' written notice to the other Party ("**Term**"), provided however, the obligations of either Party under this EULA with respect to any given information shall survive any termination of this EULA until the information no longer qualifies as Confidential Information. Without prejudice to any other rights, Tantalus may terminate the license granted pursuant to Article I of this EULA if Customer does not abide by the terms and conditions of this EULA. Upon termination of the license granted pursuant to Article I of this EULA for any reason, Customer must discontinue use and destroy or return to Tantalus, at Tantalus' discretion, the Licensed Software and all of its documentation, and all copies thereof.

Further, the sections entitled 'RESTRICTIONS ON USE,' 'EXPORT RESTRICTIONS,' 'OWNERSHIP,' 'LIMITED WARRANTY,' 'LIMITATION OF REMEDIES,' 'CUSTOMER'S SOLE REMEDY,' and this Article II shall survive any termination or expiration of this EULA. Without prejudice to any other rights, Tantalus may terminate the license granted pursuant to Article I of this EULA (a) upon termination of the Maintenance and Support Agreement or if Customer is no longer receiving Maintenance and Support Services from Tantalus or its Affiliates, (b) if Customer fails to cure any material breach of this EULA within thirty (30) days after written notice of such breach including without limitation Customer's failure to pay any amounts required pursuant to this Article II, provided that Tantalus may terminate this EULA and the license granted pursuant to Article I of this EULA immediately upon any breach of Article I of this EULA; (c) if Customer ceases operation without a successor; (d) in order to comply with applicable laws, regulations, or requests of governmental entities, including U.S. and Canadian economic sanctions laws, regulations, and requirements, and applicable foreign import and export controls; or (e) if Customer seeks protection under any bankruptcy, receivership, trust deed, creditors arrangement, composition or comparable proceeding, or if any such proceeding is instituted against such party (and not dismissed within sixty (60) days).

Payment. Customer shall pay all fees and other amounts payable associated with the Licensed Software and any goods or services purchased by Customer from Tantalus or its Affiliates, including, without limitation, all fees for Maintenance and Support Services, in accordance with the terms and conditions pursuant to which such goods and services are purchased by Customer.

Notices. All notices under this EULA must be made in writing and shall be deemed properly delivered when: (i) delivered personally, (ii) sent by e-mail to the address below, delivery confirmation required, or (iii) mailed by certified mail, postage prepaid or overnight delivery service to the address of the other Party set forth below, or (iv) sent by facsimile (provided confirmation of delivery is obtained at the time of transmission). Notices shall be effective upon receipt.

Communications must be addressed to the Parties as follows:

If to Tantalus:
Peter A. Londa, President & CEO
Tantalus Systems Inc.
1130 Situs Court, Suite 230
Raleigh, NC 27606
Facsimile: (919) 900-8978
E-mail: legal_dept@tantalus.com

If to Customer:

Facsimile:
E-mail:

Unless expressly set out to the contrary herein, consent or approval that is explicitly required herein of a Party hereto will not be unreasonably delayed, withheld or withdrawn by it.

Either Party may change the address for service by giving 15 days' advance written notice to the other Party.

Entire Agreement. This EULA constitutes the entire agreement between the Parties with respect to the subject matter hereof. Should any provision of this EULA be held invalid, illegal or unenforceable for any reason, such provision shall be deemed restricted in application to the extent required to render it valid, and the remainder of this EULA shall in no way be affected and shall remain valid and enforceable for all purposes. No modifications of this EULA will be effective unless set forth in writing signed by both Parties.

Governing Law and Venue. This EULA shall be governed and construed in accordance with the laws of the State of Delaware (without giving effect to its conflict of laws provisions which would lead to the application of the laws of another jurisdiction). If either Party employs attorneys to enforce any rights arising out of or relating to this EULA, the prevailing Party shall be entitled to recover actual, reasonable attorneys' fees. Except to the extent necessary to obtain jurisdiction over a third party, any legal action, suit or proceeding arising out of this EULA shall be brought solely and exclusively in Wake County, North Carolina, and each Party irrevocably accepts and submits to the sole and exclusive jurisdiction of tribunals in Wake County, North Carolina.

Successors and Assigns. Neither Party may assign this EULA or any rights or obligations hereunder without the prior written consent of the other Party, and any attempted assignment in contravention with the foregoing shall be void. The rights and obligations of the Parties will inure to the benefit of, will be binding upon, and will be enforceable by the Parties and their permitted successors.

Non-Waiver. A waiver of any claim, demand or right based on the breach of any provision of this EULA shall not be construed as a waiver of any other claim, demand or right based on a subsequent breach of the same or any other provision.

Counterparts. This EULA may be executed and delivered by facsimile or electronic signature and the parties agree that such facsimile execution or electronic signature and delivery shall have the same force and effect as delivery of an original document with original signatures, and that each party may use such facsimile or electronic signatures as evidence of the execution and delivery of this EULA by all parties to the same extent that an original signature could be used.

SIGNATURES ON NEXT PAGE

IN WITNESS WHEREOF, this EULA has been executed and delivered as of the date first written above.

TANTALUS SYSTEMS CORP.

By: _____

Name: _____

Title: _____

Address: _____

_____

E-Mail: _____

_____

By: _____

Name: _____

Title: _____

Address: _____

_____

E-Mail: _____

LICENSED SOFTWARE MAINTENANCE SERVICES ADDENDUM A-1

This is Addendum A-1 to the End User License Agreement.

Under the terms of this Addendum, Customer shall purchase, and Tantalus shall provide, software maintenance services, subject to the terms and conditions set out in this Addendum.

SERVICES. Subject to payment of the annual subscription fee for such services as set out below and the other terms and conditions of this Addendum, Tantalus shall provide to Customer such updates that are necessary and/or intended to maintain or improve the performance and efficiency of the Customer's existing system (the "**Updates**"), as Tantalus makes generally available to its customers, for the Licensed Software that is the subject of, and as defined in, the EULA (the "**Licensed Software Maintenance Services**"). Such Updates shall form part of the Licensed Software licensed in accordance with and subject to the terms of the EULA. Updates are performed by Tantalus technical support personnel pursuant to Exhibit B - Technical Support Agreement at no additional cost to Customer and Customer agrees to cooperate, if required, in the scheduling of such Updates.

For the avoidance of doubt, new and/or optional features, upgrades and enhanced functionalities that are not made generally available at no additional cost to all existing Tantalus customers (collectively, "**Upgrades**") may require Customer to incur additional fee(s), including without limitation, additional deployment service and project management fees, third-party licensing and related fees, licensing and recurring annual fees for Licensed Software Maintenance Services fees (collectively, "**Additional Services**"). Additional Services will be priced pursuant to Tantalus' then current price list and quoted by Tantalus, as applicable, upon receipt of a written request from Customer.

SUBSCRIPTION AND ANNUAL SUBSCRIPTION FEES. Licensed Software Maintenance Services, as described in this Addendum, shall be provided to Customer, without payment of an associated annual subscription fee, during the first 12 months following shipment of the relevant Network Equipment to Customer, as the case may be, from Shipping Point. Thereafter, Tantalus shall invoice Customer in advance on an annual basis for such Licensed Software Maintenance Services. The first invoice will be pro-rated for the period from the Start Date to January 1st of the following year and then it will be based on a January 1 to December 31 time frame. Customer shall pay to Tantalus the then current applicable annual subscription fee for such Licensed Software Maintenance Services within thirty (30) days of Customer's receipt of an invoice for such annual subscription fee from Tantalus. Any payments outstanding for more than ninety (90) days from date of invoice will be considered a default under the Agreement. In the event of a default, Tantalus shall have no obligation to provide the Licensed Software Maintenance Services to Customer during such period and any guarantees set forth in this Agreement shall be deemed null, void and of no effect until Customer cures all default amounts. In order to cure such default, Customer may request that Tantalus re-commence provision of Licensed Software Maintenance Services by (a) issuing an appropriate purchase order to Tantalus, and (b) paying to Tantalus, within thirty (30) days of Customer's receipt of an invoice for such annual subscription fees from Tantalus, the then current applicable annual subscription fee for such Licensed Software Maintenance Services, and all applicable annual subscription fees for the period of time during which the Customer was in default (the "**Back-Dated Subscription Fees**"), plus 50% of the Back-Dated Subscription Fees.

CUSTOMER RESPONSIBILITIES. Customer shall maintain up-to-date and valid backup copies of its systems and data for recovery purposes. Customer acknowledges and agrees that Tantalus' ability to restore systems is limited to the extent that such systems have up-to-date and valid backup copies, including, without limitation, in accordance with procedures provided by Tantalus. Customer is responsible for protecting from loss, damage or destruction all hardware and software (including materials, data, specifications, tapes and programs) provided by Tantalus. The replacement of any such products lost, damaged or destroyed shall be at Customer's sole expense. Customer shall provide to Tantalus all necessary information, support and cooperation as is necessary for the performance of the Licensed Software Maintenance Services under this Addendum. Without limiting the generality of the foregoing, Customer acknowledges and agrees that Tantalus requires, and Customer shall provide to Tantalus, secure and encrypted remote access to Customer's systems and servers as required and instructed by Tantalus, in Tantalus' discretion, to enable Tantalus to perform the Licensed Software Maintenance Services under this Addendum. Such instructions provided by Tantalus may include, without limitation, the use of a secure shell (ssh) or equivalent in accordance with Tantalus' security framework. If Customer requires Tantalus to utilize an alternative secure and encrypted access mechanism other than that provided or instructed by Tantalus, Customer shall pay Tantalus such additional service and support fees that may apply. Customer shall comply with the EULA, including, without limitation, the "Restrictions on Use" set out therein, failing which Tantalus shall have no obligation to provide the services described in this Addendum.

TERMINATION. Without prejudice to any other rights, Tantalus may cancel the Licensed Software Maintenance Services if Customer does not abide by the terms and conditions of this Addendum.

EXHIBIT B
TECHNICAL SUPPORT

This is Addendum A-1 to the End User License Agreement.

Unless otherwise defined in this Exhibit, each defined term will have the respective meaning set out in the Agreement.

1.Technical Support. Customer shall purchase from Tantalus, and Tantalus shall provide to Customer, the Standard email and telephone technical support set forth in Addendum B-1 ("**Technical Support**"). On-site technical support is defined later in this Exhibit. For greater certainty, Technical Support does not include in or out of warranty repairs or hardware or software upgrades for Network Equipment. Technical Support shall commence 12 months from the earlier of the date of shipment of the server, start of hosting or spin-up of virtual server, as applicable ("**Start Date**").

Optional:

☐ **Premium Level Technical Support [Check here if elected by Customer]**

2.Pricing. The price for Technical Support is outlined in Addendum B-2 and is based on the Technical Support Plan outlined in Addendum B-1 chosen by the Customer. The price is comprised of a base charge and an additional charge based on the number of endpoints ("**Endpoints**") shipped to the Customer. All prices are based on a 12-month period and are exclusive of all federal, state, municipal or other governmental sales use, excise, value-added taxes, occupational or other taxes, tariffs, duties and surcharges now in force or enacted in the future which are associated with the provision of Technical Support by Tantalus, excluding taxes on Tantalus' income generally.

3.Payment. Tantalus shall invoice Customer in advance for Technical Support, on an annual basis, commencing on the Start Date. The first invoice will be pro-rated for the period from the Start Date to January 1st of the following year and then it will be based on a January 1 to December 31 time frame. Payment terms will be net thirty (30) days from date of Tantalus' invoice. In addition to any other remedies Tantalus may have for late payments, Customer will be charged interest at 1½% per month (equivalent to an annual rate of interest of 18%), payable monthly. Payments will be applied first to interest payable and then principal owing. Tantalus may modify the preceding payment terms if, in its reasonable opinion, the payment record or financial condition of Customer so justifies. Any payments outstanding for more than 90 days from date of invoice will be considered a default under the Agreement. In the event of a default, Tantalus shall have no obligation to provide the Technical Support to Customer during such period and any guarantees set forth in this Agreement shall be deemed null, void and of no effect until Customer cures all default amounts. In order to cure such default, Customer may request that Tantalus re-commence provision of Technical Support by paying to Tantalus, within thirty (30) days of Customer's receipt of an invoice for such Technical Support from Tantalus, the then current applicable Technical Support Fee for such Technical Support, and all applicable annual Technical support for the period of time during which the Customer was in default (the "**Back-Dated Technical Support Fees).**

4.Price or Plan Changes. Tantalus reserves the right, in its sole discretion, to modify the: (1) *Technical Support Plan* as outlined in Addendum B-1 and (2) *Plan Pricing* as outlined in Addendum B-2 on written notice to Customer provided at least thirty (30) days prior to the expiry of the then current Term. In the event that Customer elects to change its Technical Support from standard to premium or vice versa at any time, Customer shall execute and deliver to Tantalus an acknowledgement of such election and the corresponding pricing associated therewith in a form acceptable to Tantalus. The level of Technical Support (and the corresponding fees associated with such Technical Support) shall not be adjusted by Tantalus until it has received such acknowledgement from Customer ("**Support Change Acknowledgement**").

5.On-Site Support. Within this Agreement, Tantalus Technical Support is email and telephone based. On-site technical support, and other support services, may be provided, and will be billed outside the scope of this Agreement, including reasonable travel and living expenses for on-site Tantalus personnel.

6.Customer Obligations. Customer agrees:

(a) that prior to requesting Technical Support, Customer will perform all diagnostics and follow the information provided by Tantalus to try and resolve any TUNet problems prior to contacting Technical Support;

(b) that in order to have continuity in Technical Support, Customer will (i) designate, in writing, a minimum of two (2) personnel who have received full training from Tantalus in the operation of TUNet ("**TUNet Operators**") and (ii) ensure that those TUNet Operators are the only individuals that request Technical Support;

(c) to install and maintain network servers and other infrastructure, including any software upgrades as may be recommended by Tantalus from time to time, consistent with the Standards;

(d) to safeguard all data during any TUNet system maintenance; and

(e) to install and maintain a robust and secure virtual private network (VPN) and/or secure shell connection (SSH) to the Tantalus network servers to allow network server maintenance, performance monitoring and upgrades as may be required.

TECHNICAL SUPPORT PLAN
ADDENDUM B-1

This document is Addendum B-1 to Exhibit B Technical Support. Unless otherwise defined in this Addendum or elsewhere in Exhibit B, defined terms will have the respective meaning set out in the Agreement. The Technical Support Plans available are as follows:

STANDARD[1]	PREMIUM [2]
Service Includes: Technical Support 7AM - 7PM, 5 days per week excluding U.S.A. and Canadian holidays (as applicable) Response to queries within 4 hours of initial contact.	Service Includes: Technical Support 7AM - 9PM, 7 days per week excluding U.S.A. and Canadian holidays (as applicable) Response to queries within 4 hours of initial contact. 7 x 24 Extended Customer Support based on exception-based monitoring* *Exception Based Monitoring is defined as alarms related to TCC and/or NC issues
Consolidated Invoices (TSA/Annual Support) - NS/NC Software Annual Maintenance - Endpoint Annual Maintenance	Consolidated Invoices (TSA/Annual Support) - NS/NC Software Annual Maintenance - Endpoint Annual Maintenance
Quarterly Training Sessions - Remote [non-certification]	Quarterly Training Sessions - Remote [non-certification]
Customer Community access	Customer Community access
	Annual Users Conference - Admission for 2
	Priority email premiumsupport@tantalus.com - Response in 4 hours
	Priority Support Line
	Online Technical Support Chat Annual Certification Training - TUNet University - Admission for 2
	Custom Billing Exports - Includes annual support
	NS (TCC) Labor Tantalus labor for troubleshooting and resolution (excludes materials)
	48-hour Part Replacement - M-F (excluding U.S.A. and Canadian holidays), cutoff by 3PM
	Advance RMA replacements - Shipment within 48 hours after reported issue
	Remote System Health Check - Annual investigation with reported customer action plan - WAN Assessment - LAN Assessment - Dashboard Health Check
	Assigned Project Manager (PM)

[1] Standard level technical support is required for all Customers.
[2] Premium level technical support is available for an additional fee, payable up front.

Individual features of each plan are as described below:

CUSTOMER SUPPORT

Standard Level – Technical support 7AM - 7PM, 5 days per week excluding U.S.A. and Canadian holidays (as applicable). Response to queries within 4 hours of initial contact.

Premium Level - Technical Support 7AM - 9PM, 7 days per week excluding U.S.A. and Canadian holidays (as applicable). Response to queries within 4 hours of initial contact.
7 x 24 Extended Customer Support based on exception-based monitoring*
*Exception Based Monitoring is defined as alarms related to TCC and/or NC issues.

CONSOLIDATED INVOICES

Consolidated invoices for annual licensed software maintenance and technical support, including VC/IPC/NS/NC Software Annual Maintenance and Endpoint Annual Maintenance are included as part of Tantalus' Standard and Premium Technical Support packages.

QUARTERLY TRAINING SESSIONS

Remote Training

The training sessions are flexible and can be broken up into multiple sessions, depending on the required participants. These WebEx based training sessions are designed as 60-90-minute web-based discussion groups, held once per quarter based upon the subject matter generated at Tantalus' Annual Users Conference. Recorded sessions are made available in Customer Community, via e-mail, etc.

COMMUNITY ACCESS

Community Access includes the following:

- Tools to track the status of current and previous equipment orders and enter and track Return Material Authorization (RMA) orders for Tantalus equipment through the Customer Community portal are made available as part of Phase 2 implementation.
- A TUNet Library provides TUNet technical product documentation and installation guides.
- A Project Information section including tracking of project related meetings and action items.
- A knowledge-based forum for open discussion of current issues in the deployment and concerns of the project team.
- An Issue Creator allows the Customer to create feature requests and other issues for the Tantalus project team in the event that the issue is not already covered in the standard system documentation. Once created, issues are evaluated, resourced, and reported based on resource availability. Time sensitive and urgent issues should be raised by Customer via Tantalus' Technical Support Line at 1.877.886.3848.

Routine Documentation Updates

Routine updates to operational TUNet material will be provided to all Customers. Examples of these Documents include Network Server Operation Manuals, TUNet endpoint product manuals, and other equipment upgraded as a part of system improvements. Updated versions of all Customer documentation will be available in Customer Community.

NOTE: THE REMAINING TECHNICAL SUPPORT FEATURES BELOW ARE ONLY AVAILABLE WITH THE PURCHASE OF PREMIUM SUPPORT PACKAGE.

ANNUAL TANTALUS USERS CONFERENCE – ADMISSION FOR TWO (2) *

With the purchase of a Premium package, the Customer receives admission for two (2) representatives to the Annual Tantalus Users Conference (TUC).

The annual TUC provides an excellent opportunity for the TUNet community to gather for education, sharing, networking, and social events. The TUC is a knowledge-driven event with heavy focus on the customer experience, technical training, and collaboration with Tantalus, utility peers, and our extensive network of partners.

*Admission includes the cost of registration for two (2) representatives only. Travel and living expenses are not included and are the responsibility of Customer. Customers with Standard packages will be responsible for costs associated with attendance, separate and apart from this Agreement.

DESIGNATED PRIORITY SUPPORT EMAIL

With purchase of a Premium package, Customer will receive a priority email address which directs email messages to the Field Operations team during non-core business hours, thereby allowing the issue being reported to receive attention prior to the start of the next Business Day. During normal business hours, response is provided within 4 hours.

Priority Support Email Address: premiumsupport@tantalus.com

PRIORITY SUPPORT LINE

With purchase of a Premium package, once available, Customer will have direct access to Tantalus' Field Operations team for placing high priority calls during non-core business hours. Upon receipt of such calls, Tantalus staff will take action, either by solving the problem directly, or by contacting other expert individuals to assist depending on the nature of the call.

Tantalus will apply commercially reasonable efforts to promptly deliver the described services in a professional and workman-like manner and in accordance with generally recognized commercial practices and standards. The promptness and utility of our response may vary from time-to-time, depending upon the accuracy and completeness of the information provided, our ability to reproduce the problem, the scope of work required to address an issue, and the volume of support service traffic at the time.

ONLINE TECHNICAL SUPPORT CHAT

Customers will be able to access Tantalus' Online Technical Support Chat ("**Live Chat**") to have a personalized one-on-one, real time, text-based interactive conversation with a Tantalus Field Service representative.

- Live Chat is available through Customer Community and will be queued on a on a first-come-first-serve basis.
- Hours of operation - 8:00am to 5:00pm, Monday – Friday, excluding U.S.A. and Canadian holidays.

ANNUAL CERTIFICATION TRAINING – TUNET UNIVERSITY

TUNet University™ – Admission for two (2) *

With purchase of a Premium package, Tantalus University™, a comprehensive training and certification series is available to TUNet Users. Tantalus University is designed to provide a full range of advanced training opportunities for TUNet Users across all utility departments. These valuable training courses will ensure that Users are able to maximize value from TUNet AMI investments, optimize system performance, and enhance technical skillsets. Class sizes are limited to ensure that students receive very focused and personalized training. Students who successfully complete Tantalus University courses will be endorsed as Certified TUNet Users. Completion of a Tantalus University course is currently the only way to receive this designation.

TUNet University training certification is required for those utility personnel responsible for reporting to and obtaining assistance from Tantalus Technical Support.

*Admission includes the cost of registration for two (2) representatives only. Travel and living expenses are not included and are the responsibility of Customer. Customers with Standard packages will be responsible for costs associated with attendance, separate and apart from this Agreement.

CUSTOM BILLING EXPORTS

With purchase of a Premium package, Customer has access to a billing function that summarizes meter data and presents it directly to Customer's billing or CIS system from TUNet.

TUNet can be used to bill utility customers based on end of day readings, interval readings, for both single-phase and poly-phase meters.

Includes customized extraction scripts of Customer data from the TUNet database and maintenance.

NS (TCC) LABOR

For problems related to component failures of Tantalus-sourced TCC hardware that is less than five (5) years old.

Includes Tantalus labor for troubleshooting and related resolution at software and hardware levels (e.g. including database administration)

Does not include materials.

48- HOUR PART REPLACEMENT

Applicable to non-warranty parts, excluding Network Server / TCC, during the times listed below. Only includes the cost associated with outgoing expedited shipping of component. Does not include the cost of material or shipping charges incurred by Customer.

Monday – Friday (excluding U.S.A. and Canadian holidays), cutoff by 3pm.

Shipment within 48 hours after reported issue.

ADVANCE RMA REPLACEMENTS

Most TUNet endpoint devices have a unique TUNet Network ID (NID) in a bar code on each unit. You can use the Customer Community to request an RMA for any of these devices (TCs, RTs, LMs, XRs, etc.). The Customer Community will tell you whether the device is under warranty and help you through the process of submitting your request.

Inquiries about Network Servers, Network Controllers and any other equipment that does not have a NID should be directed to your Project Manager.

With the purchase of a Premium package, equipment repairs conducted under the applicable equipment warranty will include advance replacement of the failed components, if such components are available in Tantalus inventory, to afford greater responsiveness to the Customer. Otherwise, Tantalus will require the failed component be received prior to shipping a replacement under warranty. Where advance replacement is provided for failed components under warranty, Customer must return the failed component, within 30 days of shipment of advance replacement, freight prepaid by Customer to Tantalus at its designated depot, together with Tantalus' return material authorization number ("**RMA**") and completed on-line problem sheet. Where advance replaced failed components are not returned by Customer within 30 days, Tantalus will invoice Customer for the price of the advance replaced component supplied and Customer hereby agrees to make payment to Tantalus within 30 days of the invoice date.

REMOTE SYSTEM HEALTH CHECK

With purchase of a Premium package, Customer receives:

- Annual investigation with reported customer action plan
- WAN Assessment
- LAN Assessment
- Dashboard Health Check

A remote system health check provides a summarized report identifying Customer actions that need to be performed in order to improve system performance.

ASSIGNED PROJECT MANAGER

With purchase of a Premium package, Tantalus will assign a specific Project Manager to the Customer's project.

TANTALUS TECHNICAL SUPPORT CONTACT INFORMATION

If you have an URGENT issue, call: +1.877.886.3848

For non-urgent issues, please email:

Standard TSA - tantalustechsupport@tantalus.com

Premium TSA - premiumsupport@tantalus.com

ADDENDUM B-2

PLAN PRICING

[INSERT ANNUAL MAINTENANCE AND SUPPORT PLAN PRICING HERE]

EXHIBIT C

DEPLOYMENT PARTNERSHIP

This is Exhibit C to the TUNet Network System Agreement. Unless otherwise defined in this Exhibit, each defined term will have the respective meaning set out in the Agreement.

1. OBJECTIVE/TERM

1.1 Objective. This Exhibit contains and describes the respective partnership responsibilities between Tantalus and Customer necessary to ensure a successful TUNet system deployment. The Network Equipment works to form a communications system with unique characteristics for each deployment. This Exhibit defines Tantalus' system deployment requirements and obligations.

1.2 Term. This Exhibit will terminate upon the termination of the Agreement.

2. SYSTEM PERFORMANCE PARTNERSHIP RESPONSIBILITIES

2.1 Overview. Tantalus will be responsible for the specified performance of the Network Equipment during the applicable warranty period as described in Section 4.1 of the Agreement, which enables the operation of TUNet as described at:

http://www.tantalus.com/tech_overview.php

Additionally, Tantalus is responsible for the proper design, delivery, installation training, testing and network operation training of the Network Equipment purchased by Customer that combine to create TUNet. Optimizing TUNet network performance requires that Tantalus specify and manage overall system configuration, customer training, and compliance to deployment plan and TUNet deployment guidelines with Customer from the outset. Further, Customer compliance with TUNet standard operating practices as outlined in the Customer System Performance Partnership Requirements in Section 2.3 of this Exhibit ("**Customer Requirements**") is mandatory in order for the Customer to optimize TUNet network performance.

2.2 Tantalus System Performance Partnership Requirements. Tantalus requirements are as follows:

(a) Bid Stage to:

(i) provide the Network Equipment list associated with the initial deployment design,

(ii) define a rough project schedule,

(iii) outline the network/Customer system interface requirements, and

(iv) provide an initial system design assessment including assisting Customer in tower site selection and procuring RF spectrum if applicable.

(b) Project Setup Stage to:

(i) provide project engineering support for the deployment of Network Equipment at the Customer site,

(ii) provide a project manager to be a single point of contact for Customer,

(iii) work with Customer to assess and deliver a final system design,

(iv) work with third parties involved in the deployment and with Customer at the start of the deployment to develop a detailed TUNet deployment project plan.

(v) provide support to Customer in developing a detailed overall project plan,

(vi) provide system design support for the deployment process to meet the specific needs of Customer,

(vii) highlight areas of concern in the deployment including identification of remote or hard to reach sites and options for overcoming communications challenges,

(viii) define the initial deployment to include the number and approximate geographic location of Network Equipment, the timeline for deployment as further outlined below ("**Initial Deployment**"),

(ix) implement a Customer training program,

(x) review the IT integration plan including meter data management ("**MDM**") and back-end integration systems to the Tantalus network server as applicable, and

(xi) provide support in identification of project milestones, Customer responsibilities, and responsibilities of any third parties to the project.

(c) Project Deployment Stage to help ensure successful Initial Deployment**,** the initial TUNet setup is a critical step in ensuring a well-functioning

network. In all cases, Tantalus requires the commitment of Customer to the agreed upon project deployment plan. The project deployment plan will include the following areas:

(i) *System Integration*. Tantalus will provide system integration, management, and support to Customer for integration activities between the TUNet network server and third-party systems utilizing TUNet data,

(ii) *Network Setup*. Tantalus will provide Customer guidance on the initial network setup, network server, wide area network ("**WAN**"), and local area network ("**LAN**") components, and

(iii) *Training*. Tantalus will provide comprehensive Customer training with respect to deployment, maintenance, and operation of the TUNet system.

(d) Deployment and System Management Stage

To help ensure the performance of TUNet, Tantalus will provide ongoing technical and software maintenance support to Customers as outlined in the Technical Support Exhibit and EULA. The Technical Support Exhibit outlines the type and cost of technical support provided to the Customer to ensure TUNet functionality and for the Customer to optimize TUNet performance.

deployment plan,

(ii) provide a project manager to be a single point of contact for Tantalus,

(iii) ensure that all appropriate Customer personnel receive initial and periodic TUNet training by Tantalus personnel,

(iv) assist in providing functioning back-haul communications infrastructure for connection to the TUNet 220 MHz wide-area-network, and/or if applicable, other wide-area network systems (Fiber, WIMAX, etc.) whether provided by the Customer or a third party, as required per the system design,

(v) install, set up, maintain and upgrade network servers consistent with industry and Tantalus recommended standards, including any software upgrades that may be provided by Tantalus from time to time as per the EULA,

2.3 Customer System Performance Partnership Requirements.

Customer requirements are as follows:

(a) Project Set-Up Stage to:

(vi) review and agree to the Project purchase and maintain a minimum level of Standard technical support from Tantalus as outlined in the Technical Support Exhibit,

(vii) install and maintain a robust and secure VPN and/or SSH to allow for server maintenance, performance monitoring, and upgrades.

(b) Project Deployment Stage to:

(i) place Purchase Orders, purchase and pay for; deploy, or arrange for deployment of; the Network Equipment, Initial Deployment Services and Maintenance and Support Services described herein as are required for the Project,

(ii) participate in TUNet system performance audits at key milestones along the deployment path to validate system effectiveness.

(c) Generally, to:

(i) install, maintain and operate the Network Equipment and TUNet in accordance with the Specifications and Standards.

For the avoidance of doubt, any failure to perform the requirements set forth in this Exhibit C shall constitute a breach of the Agreement.

* * * *

EXHIBIT D

PRICING

[TO BE COMPLETED]

EXHIBIT E

THIRD-PARTY PRODUCTS

[TO BE COMPLETED]

EXHIBIT F

MUTUAL NON-DISCLOSURE AND CONFIDENTIALITY AGREEMENT

This Mutual Non-Disclosure and Confidentiality Agreement (this "**Agreement**") is made and entered into as of _____ between Tantalus Systems Inc., a Delaware corporation, with a primary business address of 1130 Situs Court, Suite 230, Raleigh, NC 27606 ("**Tantalus**") on behalf of itself and its Affiliates, and _____ a _____ with a primary business address of _____ (**"Customer**"). Tantalus and Customer shall be collectively referred to herein as the "**Parties**" and each individually as a "**Party**". The Parties acknowledge that Tantalus and Customer have entered into, or wish to enter into, a business relationship (the "**Business Relationship**") and that in the course of past, present and/or future dealings between the Parties relating to the Business Relationship or otherwise, the Parties have disclosed and/or may disclose their respective Confidential Information (as defined below) to the other Party. This Agreement is intended to allow the Parties to have open communications during the course of the business dealings contemplated by the Business Relationship, while protecting their respective Confidential Information (including Confidential Information previously disclosed by either Party to the other Party) against unauthorized use or disclosure.

NOW, THEREFORE, in consideration of the mutual covenants set forth below, the Parties agree as follows:

1. Confidential Information. As used in this Agreement, the term "**Confidential Information**" means all information, whether or not reduced to writing, related to the Business Relationship or to the business of either Party or its Affiliates (as defined below) that (a) is provided or made available by one Party or its Affiliates or Representatives (as defined below) (the "**Disclosing Party**") to the other Party (the "**Recipient**") or observed by the Recipient in connection with the Business Relationship, in any form and at any time (whether prior or subsequent to the Effective Date), and (b) is either identified as "confidential" (or with other similar designation(s)) by the Disclosing Party, or would or should reasonably be understood by the Recipient to be confidential given the nature of the information and/or the circumstances under which such information was disclosed. Confidential Information includes but is not limited to data (technical and non-technical), formulas, patterns, compilations (including compilations of customer information), programs (including models), devices, methods (including design methods), techniques, drawings (including equipment drawings), processes, financial information (including sales forecasts), pricing, lists of actual or potential customers or suppliers (including identifying information about those customers), operational information, planning or strategy information, research and development information, information about existing and future products, and information about personnel matters of the Disclosing Party. The Parties further acknowledge and agree that the scope of the Business Relationship, performance thereof, and all discussions between the Parties and information relating thereto, constitute Confidential Information. "**Representatives**" means the directors, officers, employees, agents, consultants, legal counsel, accountants and financial advisors of a Party to this Agreement. An "**Affiliate**" of a Party means any legal entity that such Party owns, is owned by, or is under common control with such Party. For purposes of the foregoing definition of "Affiliate", the terms "control" and "own" mean possessing a 50% or greater interest in an entity or the right to direct the management of the entity.

2. Exclusions. For purposes of this Agreement, other than with respect to personal data or other legally protected information, "Confidential Information" does not include any data or information which: (a) is or becomes generally available to the public other than by the fault of the Recipient, or by a third-party that has a duty of confidentiality to the Disclosing Party with respect to the disclosed information or is otherwise prohibited from transmitting that information by a contractual, legal or other obligation; (b) is or becomes available to the Recipient on a non-confidential basis from a source other than Disclosing Party, provided that the source does not at the time of disclosure have a duty of confidentiality to the Disclosing Party with respect to the disclosed information or is not otherwise prohibited from disclosing that information by a contractual, legal or other obligation; (c) the Recipient can demonstrate by written records was, prior to its receipt from Disclosing Party, known to it at the time of disclosure; (d) is independently developed by the Recipient without use of or reliance on, directly or indirectly, Confidential Information of the Disclosing Party, as demonstrated from the written records of the Recipient; or (e) is required to be disclosed to a governmental entity or agency in connection with seeking any governmental or regulatory approval, or pursuant to the lawful requirement or request of a governmental entity or agency, or otherwise required to be disclosed by law; provided however that any information required to be disclosed under this Section 2(e) shall be subject to Section 4 below.

3. Protection of Confidential Information. Each of the Parties hereto, its Affiliates and its Representatives (a) must use the same care and discretion as it employs with its own confidential and proprietary information of a similar nature

(but in no event less than reasonable care and discretion) to maintain in confidence, and prevent disclosures of, the Confidential Information of the Disclosing Party, and (b) must not use the Confidential Information of the Disclosing Party except to further the Business Relationship or as otherwise specifically authorized in writing by the Disclosing Party. Under no circumstances, except as expressly set forth below, shall the Recipient reproduce, distribute, transfer, disclose or otherwise provide or make available, directly or indirectly, any Confidential Information of Disclosing Party to any third-party other than as permitted under Section 4 below, without the prior written consent of the Disclosing Party. Each Party understands that in addition to its obligations to the other Party under this Agreement, it may not use any Confidential Information of the Disclosing Party or permit the Disclosing Party's Confidential Information to be used by any person or entity, for its or their own benefit or to the detriment of the Disclosing Party, or in violation of any federal or state laws, including securities laws governing insider trading. Each Party understands and will inform its Representatives that such laws prohibit any person, directly or indirectly, from buying or selling securities of any company while in possession of material non-public information regarding that company.

4. Permitted and Compelled Disclosures. Recipient may disclose the Confidential Information of the Disclosing Party only to its Affiliates or Representatives who are directly involved in performing or evaluating the Business Relationship, who have a specific need to know such information, and who are obligated to hold the information in confidence and otherwise to comply with the terms of this Agreement. The Recipient agrees to instruct each of its Affiliates and Representatives to maintain the confidentiality of all of the Confidential Information and shall be liable for any unauthorized disclosures of Confidential Information or other breach of this Agreement by Recipients' Representatives authorized by Recipient to receive the information. If the Recipient is required to produce or disclose the Disclosing Party's Confidential Information by law, court order or governmental authority, the Recipient must promptly notify the Disclosing Party of that obligation. The Recipient shall not produce or disclose any such Confidential Information until the Disclosing Party has (a) requested protection from the court or other legal or governmental authority issuing the process (with the reasonable assistance of the Recipient at the Disclosing Party's expense) and the request has been denied, (b) consented in writing to the production or disclosure of such Confidential Information, or (c) taken no action to protect its interest in the Confidential Information within ten (10) business days (or such shorter period required by order of a court or other legal or governmental authority) after receipt of notice from the Recipient of the obligation to produce or disclose. Notwithstanding the foregoing, the Recipient shall only disclose such portion of the Disclosing Party's Confidential Information which the Recipient is advised by counsel is required to be disclosed in order for the Recipient to comply with legal obligation.

5. Return of Confidential Information. Within ten (10) business days following the Recipient's receipt of a written request from the Disclosing Party, the Recipient must (a) return to the Disclosing Party, or at the Disclosing Party's election destroy, all tangible materials containing or embodying the Confidential Information in its possession, custody or control; and (b) securely erase all electronic materials containing or embodying the Confidential Information but shall not be otherwise required to erase, expunge or destroy any electronic copies of Confidential Information created as a result of the Recipient's standard back-up policies and procedures for the retention of information in an electronic format, and certify the same to the Disclosing Party in writing. Notwithstanding the foregoing delivery requirement, the Recipient may destroy any notes, analyses or reports generated by the Recipient to the extent any such notes, analyses or reports contain Confidential Information, and the Recipient shall certify such destruction within such ten (10) business day period.

6. Rights and Ownership of Confidential Information. Recipient acknowledges and agrees that as between the Parties, any Confidential Information is the sole and exclusive property of the Disclosing Party. Except as expressly herein provided, this Agreement shall not be construed as granting or conferring to either Party, either expressly or impliedly, any rights, licenses or interests in or with respect to any Confidential Information of the other Party, including any intellectual property or ownership rights. This Agreement shall also not create any exclusive business relationship or other rights or obligations between the Parties, nor require the Parties to enter into any other definitive business agreement.

7. Competitive Information. Each of the Parties acknowledges and understands that the other Party may currently or in the future market or have under development products or services which are competitive with products or services now offered or which may be offered by the other Party, and, except as expressly set forth in this Agreement, the Parties' communications hereunder will not serve to impair the right of either Party to develop, make, use, procure or market products or services now or in the future which may be competitive with those offered by the other Party, nor require either Party to disclose any planning or other information to the other Party, provided that in no event may either Party use the Confidential Information of the other Party in pursuit thereof.

8. Term and Survival. This Agreement shall remain in effect until terminated by either Party upon ten (10)

business days' written notice to the other Party ("**Term**"), provided however, the obligations of either Party under this Agreement with respect to any given information shall survive any termination of this Agreement until the information no longer qualifies as Confidential Information.

9. Warranties. The Disclosing Party represents that if the Confidential Information disclosed hereunder contains confidential or proprietary information of any third-party, such third-party has authorized the disclosure of such information pursuant to the terms hereof. No other warranties of any kind are made with respect to any information disclosed under this Agreement.

10. Notices. All notices under this Agreement must be made in writing and shall be deemed properly delivered when: (i) delivered personally, (ii) sent by e-mail to the address below, delivery confirmation required, or (iii) mailed by certified mail, postage prepaid or overnight delivery service to the address of the other Party set forth below, or (iv) sent by facsimile (provided confirmation of delivery is obtained at the time of transmission). Notices shall be effective upon receipt.

Communications must be addressed to the Parties as follows:

If to Tantalus:
Peter A. Londa, President & CEO
Tantalus Systems Inc.
1130 Situs Court, Suite 230
Raleigh, NC 27606
Facsimile: (919) 900-8978
E-mail: legal_dept@tantalus.com

If to Customer:
_____
_____
_____
_____
Facsimile: _____
E-mail: _____

Unless expressly set out to the contrary herein, consent or approval that is explicitly required herein of a Party hereto will not be unreasonably delayed, withheld or withdrawn by it. Either Party may change the address for service by giving 15 days' advance written notice to the other Party.

11. Entire Agreement. This Agreement constitutes the sole and entire agreement between the Parties on the subject matter hereof, and supersedes and invalidates all other commitments, representations, warranties, conditions and understanding relating to the subject matter hereof.

12. Severability. Should any provision of this Agreement be held invalid, illegal or unenforceable for any reason, such provision shall be deemed restricted in application to the extent required to render it valid, and the remainder of this Agreement shall in no way be affected and shall remain valid and enforceable for all purposes. No modifications of this Agreement will be effective unless set forth in writing signed by both Parties.

13. Governing Law and Venue. This Agreement shall be governed and construed in accordance with the laws of the State of Delaware (without giving effect to its conflict of laws provisions which would lead to the application of the laws of another jurisdiction). If either Party employs attorneys to enforce any rights arising out of or relating to this Agreement, the prevailing Party shall be entitled to recover actual, reasonable attorneys' fees. Except to the extent necessary to obtain jurisdiction over a third-party, any legal action, suit or proceeding arising out of this Agreement shall be brought solely and exclusively in Wake County, North Carolina, and each Party irrevocably accepts and submits to the sole and exclusive jurisdiction of tribunals in Wake County, North Carolina.

14. Successors and Assigns. Neither Party may assign this Agreement or any rights or obligations hereunder without the prior written consent of the other Party, and any attempted assignment in contravention with the foregoing shall be void. The rights and obligations of the Parties will inure to the benefit of, will be binding upon, and will be enforceable by the Parties and their permitted successors.

15. Non-Waiver. A waiver of any claim, demand or right based on the breach of any provision of this Agreement shall not be construed as a waiver of any other claim, demand or right based on a subsequent breach of the same or any other provision.

16. Injunctive Relief. The Recipient acknowledges and agrees that should it or any one of its Representatives threaten to breach or breach any provision of this Agreement, the Disclosing Party will suffer irreparable damages, and its remedy at law will be inadequate. Therefore, the Disclosing Party shall be entitled, in addition to all other remedies available to it at law or in equity, to seek equitable relief, including specific performance and injunctive relief, to enforce any provision hereof and to restrain the Recipient or its Representatives from using or disclosing, in whole or in part, directly or indirectly, any Confidential Information, without payment of a bond or other security.

17. Execution in Counterparts and by Facsimile. This Agreement may be executed in one or more counterparts, all of which shall be considered one and the same agreement and shall become effective when one or more

counterparts have been signed by each of the Parties and delivered to the other Party. This Agreement may be executed and delivered electronically or by facsimile and the Parties agree that such facsimile or electronic execution and delivery shall have the same force and effect as delivery of an original document with original signatures, and that each Party may use such facsimile or electronic signatures as evidence of the execution and delivery of this Agreement by all Parties to the same extent that an original signature could be used.

IN WITNESS WHEREOF, this Agreement has been executed and delivered as of the date first written above.

TANTALUS SYSTEMS INC.

By: _____
Name: _____
Title: _____
E-Mail: _____

_____

By: _____
Name: _____
Title: _____
E-Mail: _____

EXHIBIT G

[FORM OF] STATEMENT OF WORK / SYSTEM ACCEPTANCE TEST PLAN

This Statement of Work ("**SOW**") is an attachment to that certain TUNet® Network Services Agreement ("**Agreement**") dated as of [_____] by and between Tantalus Systems Inc. ("**Tantalus**") and [_____] ("**Customer**"). Tantalus shall provide the Services and Deliverables set forth in, and pursuant to the terms of the Agreement and this SOW, including subsequent modifications thereto. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the Agreement. In the event of a conflict between this SOW and the Agreement, the terms and conditions of this SOW shall prevail unless expressly stated to the contrary herein. This SOW is effective as of the latest signature date below.

1. Description of Deliverables

1.1 Tantalus will: [REFERENCE INITIAL DEPLOYMENT SERVICES AS APPROPRIATE]

1.2 Customer will:

1.3 Installation Partner will:

2. Milestones.

The following represents sample milestones commonly seen in multi-phased AMI deployments. Upon execution of the Agreement, a Kickoff Meeting will be scheduled, and Tantalus and the Customer will work collaboratively to develop a Project Plan, including detailed milestones, specific to the Customer's deployment.

#	Milestones	Percentage of SV-1000 Payment Due
1	Project Setup/kickoff	
2	TCC (HES) Installed	
3	System Design Complete	
4	Initial Training Session	
5	System Integration	
6	Equipment Deployment	
7	Second Training	
8	SAT	
9	Project Complete	

3. Validation and Acceptance Process for Project Deliverables

Validation will consist of running the incremental test cases and comparing them to the defined success criteria described in Attachment A – System Acceptance Test Plan.

Once a test has been successfully performed and signed off on the Attachment A-1 in the System Acceptance Test Record, it is considered complete.

Acceptance shall be deemed to have occurred at such time that the Customer and Tantalus have signed off on the Tantalus System Acceptance Test Certificate (Attachment A-2) indicating that the system acceptance tests have been completed and that all requirements of Acceptance were met. With respect to each applicable milestone, the parties agree to execute the applicable Tantalus System Acceptance Test Certificate promptly upon the relevant success criteria being met with respect to the applicable system acceptance tests performed as described herein and any failure of a party to execute such certificate shall constitute a breach of the Agreement and, for the purposes of determining whether the requirements of Acceptance have been met, the applicable system acceptance tests shall be deemed to have been successfully completed. For the avoidance of doubt, neither (i) the failure of Customer to execute any Tantalus System Acceptance Test Certificate when the relevant success criteria have been met nor (ii) any act or omission by or on behalf of Customer constituting or causing a breach by Customer of the Agreement and/or the Exhibits thereto shall delay or otherwise impair Acceptance (or the Customer's obligations to pay any fees associated with Initial Deployment Services or otherwise due hereunder).

4. Change Control.

It may become necessary to amend this SOW for reasons including, but not limited to, the following:

- Discretionary changes to the project schedule
- Discretionary changes to the project scope
- Non-availability of products, resources or services which are beyond the control of Tantalus or Customer.
- Environmental or architectural impediments not previously identified.
- Lack of access to personnel or facilities necessary to progress the project.

All requested contractual changes including requests for additional services (shall be in writing pursuant to a Change Order when the change results in adjustments to affected provisions, including price, schedule, and guarantees prior to implementation of the change.

No Change Order shall be effective unless executed in writing by both Tantalus and the Customer. In the event that the Parties cannot agree on the cost of a Change Order or scope of schedule change within 15 Business Days the matter shall be submitted to mediation in accordance with the dispute resolution process set forth in this Agreement. During the pendency of any such Dispute, all parties shall remain obligated to perform under this Agreement during the pendency of the mediation.

TANTALUS SYSTEMS INC.	[_____]
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____

This is a sample SAT which will be modified to meet the requirements of the proposed solution

STANDARD SYSTEM ACCEPTANCE TEST ("SAT")

This document outlines the following:

- The equipment needed to conduct a successful SAT;
- Pre-test requirements; and
- System specific SAT tests used to verify the functionality, accuracy and reliability of Tantalus' AMI System.

NETWORK EQUIPMENT REQUIREMENTS

At a minimum, the following Tantalus system components need to be installed for a successful SAT to take place:

- At least (X) installed Tantalus electric endpoints will be required for this test. Of these (X), at least X will be new single-phase [] meters requiring the Tantalus [] communication modules and at least (X) (are required) will be poly-phase new [_____] meters requiring the Tantalus [] communications module.
- (X) IP-Based collector. Tantalus shall use the backhaul communication network provided by Customer to the collector.
- (1) TUNet Control Center
- (X) LAN Repeater (TR-1901 or TR-1905)

PRE-TEST REQUIREMENTS

The following requirements must be met before this SAT can take place:

- All Tantalus equipment is to be set up according to design specifications as per Tantalus Personnel.
- The location of at least one IP-Based Network Collector needs to be finalized by Customer and approved by Tantalus. All equipment and ancillary items (Antenna, Cabling, Grounding, etc.) needs to be in place and installed.
- An appropriate backhaul communication network must be established by Customer to the Network Controller that is reachable by the TUNet Control Center.
- The area containing the electric endpoints needs to be identified and the quantity of each meter type and all other necessary items need to be specified to Tantalus and the meter distributor.
- Purchase orders to Tantalus and the meter distributor need to be issued for all required items.

SPECIFIC SYSTEM ACCEPTANCE TESTS

The following tests will be performed to verify the functionality of the Tantalus AMI system:

1. Network Operations, LAN, TC-1216, TC-1220-RD, PP-1316, and all Tantalus-equipped meters. Installation and Association

Objective:	Verify that Tantalus-equipped meters complete a normal network acquisition and provide the expected LED status indication from power up through to association with the NS.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop. Meters will be selected to test any meter form and at least one (1) IP-Based Collector.
Method:	This test will entail installing Tantalus-equipped LAN meters that are not connected to a Transceiver. 24 hours after installation, an operator will use the Network Administrator web interface of the Network Server to verify the association status of the Tantalus-equipped meter. By using the Network Admin → LAN Device → Update Device screen, the operator can view the association status, including date and time of association and the reported hardware and firmware versions.
Success Criteria:	The Tantalus-equipped meter will associate with the network within 24 hours from the installation time.

2. Advanced Metering, Meter Activation

Objective:	Verify that newly installed meters begin delivering properly time stamped consumption data and power quality data at their set intervals within 24 hours after the installation.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop.
Method:	Delivery of periodic consumption readings may take up to 24 hours to be reported following initial meter installation/association. A new meter will be installed, and the meter serial number and time of installation noted. Up to 24 hours following installation, an operator, using the Network Server Utility Administrator web interface, will search for the meter serial number and verify that the meter is delivering consumption data by viewing the latest reading reported by the meter and the related consumption graph.
Success Criteria:	The meters must send the first consumption data and power quality data within 24 hours of the meter installation. The data must be time stamped with the correct system time.

3. On-Request Meter/ Voltage Reading

Objective:	Verify that an operator can select any meter connected to Tantalus and request an immediate update of the meter reading, voltage and view the current reading.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop.
Method:	Using the Network Server Utility Administrator web interface, an operator will select one or more meters of each meter form from the test meter socket or, if field tested, field installed base of meters for each Transceiver type and request an updated reading from the selected meter(s) and then view the updated reading noting the updated timestamp on the consumption reading. The response time will be measured and recorded. If the customer chooses to test meter(s) in the field, A field worker will reside at the physical location of each meter tested and verify the readings viewed by the Network Server operator.

Success Criteria:	The operator will view all the readings update from all the meters selected via the Network Server in less than 120 seconds from the time the request was submitted. Accuracy of the remote reading will be checked at the meter site during this test. If field tested, the operator will verify the reading with the field worker at the meters physical location and this test is satisfied for all transceivers installed.

4. Consumption and Voltage Profiles

Objective:	Verify that both the kWh readings and the voltage readings can be displayed in graphical form for any residential meter on any selected date and that kWh, kVARh (as applicable), and voltage readings can be displayed in graphical form for any commercial or industrial meter.
Setup:	At the discretion of the customer, this test may either be done using selected consumer service locations or using a test meter socket in the customer's shop. The meters used in this test must be in operation for at least 2 complete days before this test is conducted.
Method:	Using the Network Server Utility Administrator web interface, an operator will select one or more meters of each meter form from the installed base of test meters and view the graphed consumption, voltage readings, and kVARh (as applicable) readings. The graphs will be viewed for a minimum of two selected dates. If field meters are tested, meters will be chosen to test any Transceiver type installed.
Success Criteria:	The graphs display consumption and voltage for all 24 hours for residential meters. The graphs display kWh, kVARh (as applicable), and voltage for all 15-minute intervals (grouped hourly) in 24 hours for all commercial and Industrial meters of the selected days. All the graphed data accurately represents the consumption and voltage. During this process, the operator must be trained on how to change the meter interval and hence the graphed meter interval for all data above to 5 minutes for a commercial or industrial meter and 15 minutes for a residential meter.

5. Outage and Restoration Detection

Objective:	Verify that a Tantalus-equipped meter, not directly connected to a WAN transceiver, reports a power outage immediately on occurrence and reports power restoration immediately on occurrence.
Setup:	This test will entail simulating a power outage by turning off power to a Tantalus-equipped meter fitted to a test meter socket in the customer's shop and/or, if the customer so chooses,

	after the test this feature will be successfully demonstrated using a sample of installed meters of all forms at customer homes or businesses.
Method:	A clock or watch that will be used to track the times of outage and restoration must be synchronized to Tantalus. Using the Network Server Utility Administrator web interface, an operator will monitor the Event monitor window for power outage events. Power to the meters will be shut off and the time will be recorded. The operator will look for the respective outage event to appear in the Event monitor and record the time the event appeared and note the time stamp associated with the outage. The power to the meters shall be left off for at least 5 minutes to ensure the meter module's capacitors have fully discharged, then power will be restored, and the time of restoration will be recorded. The operator will look for the respective outage event to clear (i.e. power restoration) in the TUNet Monitor and record the time the event cleared and note the time stamp associated with the restoration. Multiple meters may be tested at the same time whether tested in the shop or in the field.
Success Criteria:	The outage event for all meters will appear within 2 minutes of occurrence and the restoration event (outage clearing) will occur within 10 minutes after the power has been restored to the meters. The time stamps of both events for a particular meter should match the recorded times of the respective power outage and restoration actions, within ± 1 second.

At the discretion of the customer, any of the above tests may be repeated. Once a test has been successfully performed and every required test (not just one particular test) has been signed off in the Tantalus SAT Record (Appendix A), it will be considered complete. The term test should not be misconstrued to be a one-time occurrence. The system should perform to the test level 90% of the time. Therefore, Tantalus cannot continue to try to pass a test until it does and construe this performance as passing any of the tests performed unless there is a technically reason why the test could not be successfully performed (e.g. device under test not connected).

Upon signing off all tests in the Tantalus SAT Record, the Customer and Tantalus will sign the Tantalus System Acceptance Test Certificate (Appendix B) indicating that the system acceptance tests have been completed and that all requirements were met, and all tests passed.

Note: Production acquisition and full deployment of meters and supporting equipment are dependent upon successful SAT completion and acceptance by the customer.

Appendix A

ROW #	Reference Contract #	Tantalus Test #	Description	Date Tested	Pass / Fail	Notes	Initials
1		1	Network Operations, General, Time Synchronization				
2		2	Advanced Metering, Meter Activation				
3		3	On-Request Meter/Voltage Reading				
4		4	Consumption and Voltage Profiles				
5		5	Outage and Restoration Detection				

Appendix A

Tantalus Utility Network (TUNet®)

System Acceptance Test Certificate

Pursuant to the Tantalus System Acceptance Test Plan, as mutually agreed to between Tantalus Systems Inc. and CUSTOMER NAME HERE., this certificate recognizes that on the__ day of_____, 20_, the complete set of system acceptance tests have passed and that the commissioned Tantalus Utility Network has been accepted.

Tantalus Systems Inc.	**CUSTOMER NAME HERE.** Customer
Signature	Signature
Name	Name
Title	Title
Date	Date

Appendix E: Additional Supporting Documentation

TUNet® Technical Support Plan Summary

The Technical Support Plans available are as follows:

STANDARD	PREMIUM TECHNICAL SUPPORT
5 x 12 Customer Support *- 7AM - 7PM, 5 days per week excluding U.S.A. and Canadian holidays*	7 x 24 Extended Customer Support
Consolidated Invoices (TSA/Annual Support) *- NS/NC Software Annual Maintenance* *- Endpoint Annual Maintenance*	Consolidated Invoices (TSA/Annual Support) *- NS/NC Software Annual Maintenance* *- Endpoint Annual Maintenance*
Quarterly Training Sessions *- Remote [non-certification]*	Quarterly Training Sessions *- Remote [non-certification]*
Customer Community access	Customer Community access
	Annual Users Conference *- Admission for 2*
	Priority email premiumsupport@tantalus.com *-Response in 4 hours*
	Priority Support Line
	Online Technical Support Chat Annual Certification Training *- TUNet University* *- Admission for 2*
	Custom Billing Exports *- Includes annual support*
	NS (TCC) Labor Tantalus labor for troubleshooting and resolution (excludes materials)
	48 hour Part Replacement *- M-F (excluding U.S.A. and Canadian holidays), cutoff by 3PM*
	Advance RMA replacements *- Shipment within 48 hours after reported issue*
	Remote System Health Check *- Annual investigation with reported customer action plan* *- WAN Assessment* *- LAN Assessment* *- Dashboard Health Check*
	Assigned Project Manager (PM)

Individual features of each plan are as described below:

CUSTOMER SUPPORT

Standard Level - 5 x 12 Technical Support (7 am to 7 pm). Customer Support is available Monday through Friday excluding United States and Canadian statutory holidays via telephone and a normal customer service email address.

Premium Level - 7 x 24 Extended Customer Support (less than 2 hour response time during regular business hours with scaled support after hours), Exception Based Remote Monitoring (based on system alerts and urgency), Advance Repair and Replace for Warranty Devices, and Full Customer Community Access.

CONSOLIDATED INVOICES

Consolidated invoices for annual licensed software maintenance and technical support, including VC/IPC/NS/NC Software Annual Maintenance and Endpoint Annual Maintenance are included as part of Tantalus' Standard and Premium Technical Support packages.

QUARTERLY TRAINING SESSIONS

Remote Training

The training sessions are flexible and can be broken up into multiple sessions, depending on the required participants. These WebEx based training sessions are designed as 60-90 minute web based discussion groups, held once per quarter based upon the subject matter generated at Tantalus' Annual Users Conference. Recorded sessions are made available in Customer Community, via e-mail, etc.

COMMUNITY ACCESS

Community Access includes the following:

- Tools to track the status of current and previous equipment orders and enter and track Return Material Authorization (RMA) orders for Tantalus equipment through the Customer Community portal are made available as part of Phase 2 implementation.
- A TUNet Library provides TUNet technical product documentation and installation guides.
- A Project Information section including tracking of project related meetings and action items.
- A knowledge based forum for open discussion of current issues in the deployment and concerns of the project team.
- An Issue Creator allows the Customer to create feature requests and other issues for the Tantalus project team in the event that the issue is not already covered in the standard system documentation. Once created, issues are evaluated, resourced, and reported based on resource availability. Time sensitive and urgent issues should be raised by Customer via Tantalus' Technical Support Line at +1 (919) 335-8109.

Routine Documentation Updates

Routine updates to operational TUNet material will be provided to all Customers. Examples of these Documents include Network Server Operation Manuals, TUNet endpoint product manuals, and other equipment upgraded as a part of system improvements. Updated versions of all Customer documentation will be available in Customer Community.

NOTE: THE REMAINING TECHNICAL SUPPORT FEATURES BELOW ARE ONLY AVAILABLE WITH THE PURCHASE OF PREMIUM SUPPORT PACKAGE.

ANNUAL TANTALUS USERS CONFERENCE – ADMISSION FOR TWO (2)*

With the purchase of a Premium package, the Customer receives admission for two (2) representatives to the Annual Tantalus Users Conference (TUC).

The annual TUC provides an excellent opportunity for the TUNet community to gather for education, sharing, networking, and social events. The TUNet User conference is a knowledge-driven event with heavy focus on the customer experience, technical training, and collaboration with Tantalus, utility peers, and our extensive network of partners.

*Admission includes the cost of registration for two (2) representatives only. Travel and living expenses are not included and are the responsibility of Customer. Customers with Standard packages will be responsible for costs associated with attendance, separate and apart from this Agreement.

DESIGNATED PRIORITY SUPPORT EMAIL

With purchase of a Premium package, Customer will receive a priority email address which directs email messages to the Field Operations team during non-core business hours, thereby allowing the issue being reported to receive attention prior to the start of the next business day. During normal business hours, response is provided within 4 hours.

Priority Support Email Address: premiumsupport@tantalus.com

PRIORITY SUPPORT LINE

With purchase of a Premium package, once available, Customer will have direct access to Tantalus' Field Operations team for placing high priority calls during non-core business hours. Upon receipt of such calls, Tantalus staff will take action, either by solving the problem directly, or by contacting other expert individuals to assist depending on the nature of the call.

Tantalus will apply commercially reasonable efforts to promptly deliver the described services in a professional and workman-like manner and in accordance with generally recognized commercial practices and standards. The promptness and utility of our response may vary from time-to-time, depending upon the accuracy and completeness of the information provided, our ability to reproduce the problem, the scope of work required to address an issue, and the volume of support service traffic at the time.

ONLINE TECHNICAL SUPPORT CHAT

Customers will be able to access Tantalus' Online Technical Support Chat ("Live Chat") to have a personalized one-on-one, real time, text-based interactive conversation with a Tantalus Field Service representative.

- Live Chat is available through Customer Community and will be queued on a on a first-come-first-serve basis.
- Hours of operation - 8:00am to 5:00pm, Monday – Friday, excluding U.S.A. and Canadian holidays.

ANNUAL CERTIFICATION TRAINING – TUNET UNIVERSITY
TUNet University™ – Admission for two (2)*

With purchase of a Premium package, Tantalus University™, a comprehensive training and certification series is available to TUNet Users. Tantalus University is designed to provide a full range of advanced training opportunities for TUNet Users across all utility departments. These valuable training courses will ensure that Users are able to maximize value from TUNet AMI investments, optimize system performance, and enhance technical skillsets. Class sizes are limited to ensure that students receive very focused and personalized training. Students who successfully complete Tantalus University courses will be endorsed as Certified TUNet Users. Completion of a Tantalus University course is currently the only way to receive this designation.

TUNet University training certification is required for those utility personnel responsible for reporting to and obtaining assistance from Tantalus Technical Support.

*Admission includes the cost of registration for two (2) representatives only. Travel and living expenses are not included and are the responsibility of Customer. Customers with Standard packages will be responsible for costs associated with attendance, separate and apart from this Agreement.

CUSTOM BILLING EXPORTS
With purchase of a Premium package, Customer has access to a billing function that summarizes meter data and presents it directly to Customer's billing or CIS system from TUNet.

TUNet can be used to bill utility customers based on end of day readings, interval readings, for both single-phase and poly-phase meters.

Includes customized extraction scripts of Customer data from the TUNet database and maintenance.

NS (TCC) LABOR
For problems related to component failures of Tantalus-sourced TCC hardware that is less than five (5) years old.

Includes Tantalus labor for troubleshooting and related resolution at software and hardware levels (e.g. including database administration)

Does not include materials.

48-HOUR PART REPLACEMENT
Applicable to non-warranty parts, excluding Network Server / TCC, during the times listed below. Only includes the cost associated with outgoing expedited shipping of component. Does not include the cost of material or shipping charges incurred by Customer.

Monday – Friday (excluding U.S.A. and Canadian holidays), cutoff by 3pm.
Shipment within 48 hours after reported issue.

ADVANCE RMA REPLACEMENTS

Most TUNet endpoint devices have a unique TUNet Network ID (NID) in a bar code on each unit. You can use the Customer Community to request an RMA for any of these devices (TCs, RTs, LMs, XRs, etc.). The Customer Community will tell you whether the device is under warranty, and help you through the process of submitting your request.

Inquiries about Network Servers, Network Controllers and any other equipment that does not have a NID should be directed to your Project Manager.

With the purchase of a Premium package, equipment repairs conducted under the applicable equipment warranty will include advance replacement of the failed components, if such components are available in Tantalus inventory, to afford greater responsiveness to the Customer. Otherwise, Tantalus will require the failed component be received prior to shipping a replacement under warranty. Where advance replacement is provided for failed components under warranty, Customer must return the failed component, within 30 days of shipment of advance replacement, freight prepaid by Customer to Tantalus at its designated depot, together with Tantalus' return material authorization number ("**RMA**") and completed on-line problem sheet. Where advance replaced failed components are not returned by Customer within 30 days, Tantalus will invoice Customer for the price of the advance replaced component supplied and Customer hereby agrees to make payment to Tantalus within 30 days of the invoice date.

REMOTE SYSTEM HEALTH CHECK

With purchase of a Premium package, Customer receives:

- Annual investigation with reported customer action plan
- WAN Assessment
- LAN Assessment
- Dashboard Health Check

A remote system health check provides a summarized report identifying Customer actions that need to be performed in order to improve system performance.

ASSIGNED PROJECT MANAGER

With purchase of a Premium package, Tantalus will assign a specific Project Manager to the Customer's project.

TANTALUS TECHNICAL SUPPORT CONTACT INFORMATION

If you have an URGENT issue, call: (877) 886-3848

For non-urgent issues, please email:
Standard TSA - tantalustechsupport@tantalus.com
Premium TSA - premiumsupport@tantalus.com

Water Meter and Telemetry Module Compatibility List

Revision Z17, May 2017

Contents

Water Meter Compatibility for 900 MHz ERT Products

Encoder ERTs	Part Numbers
60W Encoder, Inline Connector	ERW-0771-202
60W Encoder, 5’ Cable	ERW-0771-212
60W-R Encoder, Remote	ERW-0771-422
60W Encoder, Inline Connector	ERW-0771-204
60W Encoder, 5’ Cable	ERW-0771-214
60W-R Encoder, Remote	ERW-0771-424
60W Encoder, Inline Connector	ERW-0771-205
60W Encoder, 5’ Cable	ERW-0771-215
60W-R Encoder, Remote	ERW-0771-425
60W Encoder, Inline Connector	ERW-0771-206
60W Encoder, 5’ Cable	ERW-0771-216
60W-R Encoder, Remote	ERW-0771-426
100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
100W-R Encoder remote, 10” cable	ERW-1300-213
100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
100W-R+ Encoder remote, 10” cable	ERW-1300-313
100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Pulser ERTs	Part Numbers
60WP Pulser, Inline Connector	ERW-0771-301
60WP Pulser, 5’ Cable	ERW-0771-311
60WP-R Pulser, Remote	ERW-0771-423
100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
100WP-R Pulser remote, 10” cable	ERW-1300-215
100WP-R Pulser remote, 10” cables for register and telemetry device	ERW-1300-216
100WP-R+ Pulser remote, 10” cable	ERW-1300-315
100WP-R+ Pulser remote, 10” cables for register and telemetry device	ERW-1300-316

Badger Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
ADE[4]	Any meter that accepts ADE registers			All	All	All	A, E, F, G, H
ADE 6 dial	E-Series			All	All	UltraSonic	A, E, F, G, H
ADE 9 dial	E-Series			All	All	UltraSonic	F, H
HR E LCD[16]	Any meters that accept HR E registers		12	All	All	All	A, E, F, G, H
HR E Mechanical 8 dial	Any meter that accept HR E registers			All	All	All	F, H
HR E Mechanical 6 dial	Any meter that accept HR E registers			All	All	All	A, E, F, G, H
ADE	M5000[22] Mag Meter			All	All	All	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Badger Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
RTR 6 dial	E-Series			All	All	Ultra Sonic	A, B, C, D, E
RTR, Dual RTR	Any meters that accept RTR, Dual RTR or these registers used with Summator/Splitter or Badger's Submersible Connector			All	All	All	A, B, C, D, E
RTR	M5000$_{22}$ Mag Meter			All	All	All	A, B, C, D, E

A	60WP Pulser, Inline Connector	ERW-0771-301
	60WP Pulser, 5' Cable	ERW-0771-311
	60WP-R Pulser, Remote	ERW-0771-423
B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5' cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5' cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20" cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20" cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5' cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5' cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20" cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20" cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
D	100WP-R Pulser remote, 10" cable	ERW-1300-215
	100WP-R Pulser remote, 10" cables for register and telemetry device	ERW-1300-216
E	100WP-R+ Pulser remote, 10" cable	ERW-1300-315
	100WP-R+ Pulser remote, 10" cables for register and telemetry device	ERW-1300-316

Cadillac Meter Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
Digital Output 1 and Digital Output 2[25]	CMAG/EMAG			All	All	Magnetic Flow Meter	A, B, C

A	60WP Pulser, Inline Connector	ERW-0771-301
	60WP Pulser, 5’ Cable	ERW-0771-311
	60WP-R Pulser, Remote	ERW-0771-423
B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420

[FORM OF] STATEMENT OF WORK

This Statement of Work ("**SOW**") is an attachment to that certain [EXISTING AGREEMENT] ("**[ABRV]**") dated as of [DATE] by and between [TANTALUS ENTITY] ("**Tantalus**") and [CUSTOMER NAME] ("**Customer**"). Tantalus shall provide the services and deliverables set forth in, and pursuant to the terms of the Agreement and this SOW, including subsequent modifications thereto. Capitalized terms not otherwise defined herein shall have the meanings ascribed to them in the Agreement. In the event of a conflict between this SOW and the Agreement, the terms and conditions of this SOW shall prevail unless expressly stated to the contrary herein. This SOW is effective as of the latest signature date below.

1. Description of Deliverables

Click or tap here to enter text.

1.1 **Tantalus** will:

Click or tap here to enter text.

1.2 **Customer** will:

Click or tap here to enter text.

1.3 **Installation Partner** will:

Click or tap here to enter text.

2. Milestones.

The following represents sample milestones commonly seen in AMI deployments. Upon execution of the Agreement, a kickoff meeting will be scheduled and Tantalus and the Customer will work collaboratively to develop a Final Network Design and Plan, including detailed milestones, specific to the Customer's deployment.

#	Milestones	Percentage of SV-1000 Payment Due
1	Project Setup/kickoff	Click or tap here to enter text.
2	TCC (HES) Installed	Click or tap here to enter text.
3	System Design Complete	Click or tap here to enter text.
4	Initial Training Session	Click or tap here to enter text.
5	System Integration	Click or tap here to enter text.
6	Equipment Deployment	Click or tap here to enter text.
7	Second Training	Click or tap here to enter text.
8	SAT	Click or tap here to enter text.
9	Project Complete	Click or tap here to enter text.

3. Validation and Acceptance Process for Project Deliverables (as required)

Validation will consist of running the incremental test cases and comparing them to the defined success criteria described in Attachment A – System Acceptance Test Plan.

Once a test has been successfully performed and signed off on the Attachment A-1 in the System Acceptance Test Record, it is considered complete.

Acceptance shall be deemed to have occurred at such time that the Customer and Tantalus have signed off on the Tantalus System Acceptance Test Certificate (Attachment A-2) indicating that the system acceptance tests have been completed and that all requirements of Acceptance were met. With respect to each applicable milestone, the parties agree to execute the applicable Tantalus System Acceptance Test Certificate promptly upon the relevant success criteria being met with respect to the applicable system acceptance tests performed as described herein and any failure of a party to execute such certificate shall constitute a breach of the Agreement.

4. Change Control.

It may become necessary to amend this SOW for reasons including, but not limited to, the following:

- Discretionary changes to the project schedule
- Discretionary changes to the project scope
- Non-availability of products, resources or services which are beyond the control of Tantalus or Customer
- Environmental or architectural impediments not previously identified
- Lack of access to personnel or facilities necessary to progress the project

All requested contractual changes including requests for Additional Services shall be in writing pursuant to a Change Order when the change results in adjustments to affected provisions, including price, schedule, and guarantees prior to implementation of the change.

No Change Order shall be effective unless executed in writing by both Tantalus and the Customer. In the event that the Parties cannot agree on the cost of a Change Order or scope of schedule change within 15 business days the matter shall be submitted to mediation in accordance with the dispute resolution process set forth in this Agreement. During the pendency of any such dispute, all parties shall remain obligated to perform under this Agreement during the pendency of the mediation.

[TANTALUS ENTITY]	[CUSTOMER NAME]
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____

This is a sample SAT which will be modified to meet the requirements of the proposed solution.

SYSTEM ACCEPTANCE TEST ("SAT")

This document outlines the following:

- The equipment needed to conduct a successful SAT;
- Pre-test requirements; and
- System specific SAT tests used to verify the functionality, accuracy and reliability of Tantalus' AMI System.

NETWORK EQUIPMENT REQUIREMENTS

At a minimum, the following Tantalus system components need to be installed for a successful SAT to take place:

- At least [# of meters] installed Tantalus electric endpoints will be required for this test. Of these [# of meters], at least [# of meters] will be new single-phase [METER MANUFACTURER NAME]. meters requiring the Tantalus [MODULE PRODUCT CODE].
- Tantalus shall use Customer's preexisting fiber or a cellular modem added to Click or tap here to enter text to connect to the collector.
- One (1) TUNet Control Center
- (X) LAN Repeater (TR-1901 or TR-1905)

PRE-TEST REQUIREMENTS

The following requirements must be met before this SAT can take place:

- All Tantalus equipment is to be setup according to design specifications as per Tantalus personnel.
- The location of at least one (1) Tantalus VersaComms Gateway (VC) IP-Based Network Collector needs to be finalized by [CUSTOMER NAME] and approved by Tantalus. All equipment and ancillary items (Antenna, Cabling, Grounding, etc.) needs to be in place and installed.
- An appropriate backhaul communication network must be established by [CUSTOMER NAME] to the Network Controller that is reachable by the TUNet Control Center.
- The area containing the electric endpoints needs to be identified and the quantity of each meter type and all other necessary items need to be specified to Tantalus and the meter distributor.
- Purchase orders to Tantalus and the meter distributor need to be issued for all required items.

SPECIFIC SYSTEM ACCEPTANCE TESTS

The following tests will be performed to verify the functionality of the Tantalus AMI system:

1. Network Operations, LAN, TC-1216, TC-1220-RD, PP-1316, and all Tantalus-equipped meters. Installation and Association

Objective:	Verify that Tantalus-equipped meters complete a normal network acquisition and provide the expected LED status indication from power up through to association with the NS.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop. Meters will be selected to test any meter form and at least one (1) IP-Based Collector.
Method:	This test will entail installing Tantalus-equipped LAN meters that are not connected to a Transceiver. 24 hours after installation, an operator will use the Network Administrator web interface of the Network Server to verify the association status of the Tantalus-equipped meter. By using the Network Admin → LAN Device → Update Device screen, the operator can view the association status, including date and time of association and the reported hardware and firmware versions.
Success Criteria:	The Tantalus-equipped meter will associate with the network within 24 hours from the installation time.

2. Advanced Metering, Meter Activation

Objective:	Verify that newly installed meters begin delivering properly time stamped consumption data and power quality data at their set intervals within 24 hours after the installation.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop.
Method:	Delivery of periodic consumption readings may take up to 24 hours to be reported following initial meter installation/association. A new meter will be installed and the meter serial number and time of installation noted. Up to 24 hours following installation, an operator, using the Network Server Utility Administrator web interface, will search for the meter serial number and verify that the meter is delivering consumption data by viewing the latest reading reported by the meter and the related consumption graph.
Success Criteria:	The meters must send the first consumption data and power quality data within 24 hours of the meter installation. The data must be time stamped with the correct system time.

3. On-Request Meter/ Consumption/Voltage Reading

Objective:	Verify that an operator can select any meter connected to Tantalus and request an immediate update of the meter reading, voltage and view the current reading.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop.
Method:	Using the Network Server Utility Administrator web interface, an operator will select one or more meters of each meter form from the test meter socket or, if field tested, field installed base of meters for each Transceiver type and request an updated reading from the selected meter(s) and then view the updated reading noting the updated timestamp on the consumption reading. The response time will be measured and recorded. If the customer chooses to test meter(s) in the field, A field worker will reside at the physical location of each meter tested and verify the readings viewed by the Network Server operator.
Success Criteria:	The operator will view all the readings update from all the meters selected via the Network Server in less than 120 seconds from the time the request was submitted. Accuracy of the remote reading will be checked at the meter site during this test. If field tested, the operator will verify the reading with the field worker at the meters physical location and this test is satisfied for all transceivers installed.

4. Consumption and Voltage Profiles

Objective:	Verify that both the kWh readings and the voltage readings can be displayed in graphical form for any residential meter on any selected date and that kWh, kVARh (as applicable), and voltage readings can be displayed in graphical form for any commercial or industrial meter.
Setup:	At the discretion of the customer, this test may either be done using selected consumer service locations or using a test meter socket in the customer's shop. The meters used in this test must be in operation for at least 2 complete days before this test is conducted.
Method:	Using the Network Server Utility Administrator web interface, an operator will select one or more meters of each meter form from the installed base of test meters and view the graphed consumption, voltage readings, and kVARh (as applicable) readings. The graphs will be viewed for a minimum of two selected dates. If field meters are tested, meters will be chosen to test any Transceiver type installed.
Success Criteria:	The graphs display consumption and voltage for all 24 hours for residential meters. The graphs display kWh, kVARh (as applicable), and voltage for all 15-minute intervals (grouped hourly) in 24 hours for all commercial and Industrial meters of the selected days. All the graphed data accurately represents the consumption and voltage. During this process, the operator must be trained on how to change the meter interval and hence the graphed meter interval for all data above to 5 minutes for a commercial or industrial meter and 15 minutes for a residential meter.

5. Outage and Restoration Detection

Objective:	Verify that a Tantalus-equipped meter, not directly connected to a WAN transceiver, reports a power outage immediately on occurrence and reports power restoration immediately on occurrence.
Setup:	This test will entail simulating a power outage by turning off power to a Tantalus-equipped meter fitted to a test meter socket in the customer's shop and/or, if the customer so chooses, after the test this feature will be successfully demonstrated using a sample of installed meters of all forms at customer homes or businesses.
Method:	A clock or watch that will be used to track the times of outage and restoration must be synchronized to Tantalus. Using the Network Server Utility Administrator web interface, an operator will monitor the Event monitor window for power outage events. Power to the meters will be shut off and the time will be recorded. The operator will look for the respective outage event to appear in the Event monitor and record the time the event appeared and note the time stamp associated with the outage. The power to the meters shall be left off for at least 5 minutes to ensure the meter module's capacitors have fully discharged, then power will be restored and the time of restoration will be recorded. The operator will look for the respective outage event to clear (i.e. power restoration) in the TUNet Monitor and record the time the event cleared and note the time stamp associated with the restoration. Multiple meters may be tested at the same time whether tested in the shop or in the field.
Success Criteria:	The outage event for all meters will appear within 2 minutes of occurrence and the restoration event (outage clearing) will occur within 10 minutes after the power has been restored to the meters. The time stamps of both events for a particular meter should match the recorded times of the respective power outage and restoration actions, within ± 1 second.

6. Reading of ERT Electric Meters

Objective:	Verify that a Tantalus system will report billing information for ERT Electric Meters through TUNet.
Setup:	Authorize and Install Electric ERT devices on the TUNet network as per established Tantalus Guidelines. Verify discovery and reading of authorized electric ERT devices.
Method:	Manually export appropriate billing file and manually import into the MVRS and process to CIS.
Success Criteria:	Billing Read is successfully delivered for billing

7. Remote Disconnect and Reconnect of TC-1220-RD Enabled Meters

Objective:	Verify that a Tantalus enabled Itron remote disconnect meter will disconnect and reconnect the service on command.
Setup:	Use an Itron Centron II Remote Disconnect meter with the TC-1220-RD Tantalus Module to conduct this test. Meter should be setup in a controlled environment with power. Meter must be fully associated on the Tantalus system.
Method:	Through Tantalus Insight, look-up the test meter details and under the Remote Disconnect widget, send a "Get Status" command to the meter verify that it is currently in a power connected state and communicating. Proceed to select the "Disconnect" function on the remote disconnect meter. Through a live update, Tantalus will show the command being sent to the meter and a successful validation of the power being disconnected. A utility employee will be monitoring the meter, verifying that the relay did actuate and that load side power is zero volts. After validation and 60 seconds or more from actuating the relay (allowing the relay circuit to recharge), through Tantalus Insight, the "Connect" or "Arm for Connect" functions can be selected. Through a live update, Tantalus will show the command being sent to the meter and a successful validation of the power being reconnected or that the armed state is active, allowing for the re-connect button on the meter to be enabled for the relay actuation. Utility can choose which function to test, connect or armed for connect, and take the appropriate action to connect back the server accordingly. Once connected, the utility employee will verify that the relay did actuate and that power is once again supplied to the load side.
Success Criteria:	Remote Disconnect Meter will successfully disconnect and reconnect the load side power via the TUNet interface.

8. Events and Alarms

Objective:	Verify that (to the extent practical) meter events and alarms provided by the meters supported by TUNet can be retrieved and reported.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations using live meters or a test meter socket in the customer's shop or some combination of both.
Method:	Using Tantalus Insight, an operator will create conditions on the test bench at the meter shop to simulate events and alarms (to the extent practical) the meter is capable of generating.
Success Criteria:	Events and alarms can be generated and observed in TUNet.

At the discretion of the customer, any of the above tests may be repeated. Once a test has been successfully performed and every required test (not just one particular test) has been signed off in the Tantalus SAT record (Appendix A), it will be considered complete. The term test should not be misconstrued to be a one-time occurrence. The system should perform to the test level 90% of the time. Therefore, Tantalus cannot continue to try to pass a test until it does and construe this performance as passing any of the tests performed unless there is a technically reason why the test could not be successfully performed (e.g. device under test not connected).

Upon signing off all tests in the Tantalus SAT record, Customer and Tantalus will sign the Tantalus System Acceptance Test Certificate (Appendix B) indicating that the system acceptance tests have been completed and that all requirements for a successful deployment were met and all tests passed.

Note: Production acquisition and full deployment of meters and supporting equipment are dependent upon successful SAT completion and acceptance by the Customer.

Tantalus Test #	Description	Date Tested	Pass / Fail	Notes	Initials
1	Network Operations, Installation, & Association				
2	Advanced Metering, Meter Activation				
3	On-Request Meter Consumption & Voltage Reading				
4	Consumption and Voltage Profiles				
5	Outage and Restoration Detection				
6	Reading of ERT Electric Meters				
7	Remote Disconnect and Reconnect of TC-1220-RD Enabled Meters				
8	Events and Alarms				

Tantalus Utility Network (TUNet®)

System Acceptance Test Certificate

Pursuant to the Tantalus System Acceptance Test Plan, as mutually agreed to between Tantalus Systems Inc. and [CUSTOMER NAME], this certificate recognizes that on [ACCEPTANCE DATE], the complete set of system acceptance tests have passed and that the commissioned Tantalus Utility Network has been accepted.

[TANTALUS ENTITY]	[CUSTOMER NAME] Customer
Signature	Signature
Name	Name
Title	Title
Date	Date

Diehl Meter Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
	Hydrus[23]	Encoder Board Layout 10220	2.2.6	All	All		A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Elster AMCO (ABB) Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTS By Group
AquaMaster	AquaMaster			All	All	Magnetic Flowmeter	D
AquaMaster III	AquaMaster III[26]	FET2211A0Y5G5S1ADM5	VKK WAJC2103 01.01.00	All	All		D, E, F, G, H
	evoQ4 Mag			All	All	Electro Magnetic	D, E, G
	evoQ4 Sensus[23]	V6 and V8	V08	All	All		A, E, F, G, H
InVision[13] or Scancoder	Any meters that accept InVision or Scancoder registers			All	All	All	D, E, F, G, H
Q200	Q200	MC1042	ME1024	All	All	Electro Magnetic	A, E, F, G, H
	SM700			All	All	Fluidic	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
D	60W Encoder, Inline Connector	ERW-0771-206
	60W Encoder, 5’ Cable	ERW-0771-216
	60W-R Encoder, Remote	ERW-0771-426
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Elster AMCO(ABB) Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
Digital[2]	C3000 and C4000			All	All	Compound	A, B, C, D, E
Digital[2]	C700[1]			All	All	Positive Displacement	A, B, C, D, E
Digital[2]	T3000 and T4000			All	All	Turbine	A, B, C, D, E
	V100T10 (PSMT)			All	All	Positive Displacement	A, B, C, D, E

A	60WP Pulser, Inline Connector	ERW-0771-301
	60WP Pulser, 5’ Cable	ERW-0771-311
	60WP-R Pulser, Remote	ERW-0771-423
B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
D	100WP-R Pulser remote, 10” cable	ERW-1300-215
	100WP-R Pulser remote, 10” cables for register and telemetry device	ERW-1300-216
E	100WP-R+ Pulser remote, 10” cable	ERW-1300-315
	100WP-R+ Pulser remote, 10” cables for register and telemetry device	ERW-1300-316

ITRON(Actaris) Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
Cyble Coder[12]	Flostar			All	All	Single Jet	A, E, F, G, H
Cyble Coder[12]	Woltex			All	All	Turbine	A, E, F, G, H
Cyble Coder[12]	Multimag			All	All	Mulit Jet	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

ITRON(Actaris) Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
Cyble Sensor[11]	Flostar			All	All	Single Jet	A, B, C, D, E
Cyble Sensor[11]	Multimag			All	All	Multi Jet	A, B, C, D, E
Cyble Sensor[11]	Woltex			All	All	Turbine	A, B, D

A	60WP Pulser, Inline Connector	ERW-0771-301
	60WP Pulser, 5’ Cable	ERW-0771-311
	60WP-R Pulser, Remote	ERW-0771-423
B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
D	100WP-R Pulser remote, 10” cable	ERW-1300-215
	100WP-R Pulser remote, 10” cables for register and telemetry device	ERW-1300-216
E	100WP-R+ Pulser remote, 10” cable	ERW-1300-315
	100WP-R+ Pulser remote, 10” cables for register and telemetry device	ERW-1300-316

Krohne Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
IFC 070[19]	Waterflux			All	All	Magnetic Flow Meter	B, C, D, E

B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
D	100WP-R Pulser remote, 10” cable	ERW-1300-215
	100WP-R Pulser remote, 10” cables for register and telemetry device	ERW-1300-216
E	100WP-R+ Pulser remote, 10” cable	ERW-1300-315
	100WP-R+ Pulser remote, 10” cables for register and telemetry device	ERW-1300-316

Kamstrup Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
	flowIQ2100			All	All	Ultrasonic	A, F, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

MasterMeter Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
AccuLinx[18]	Any meter that accepts AccuLinx registers			All	All	All	F, H
eLinx	Any meter that accepts eLinx registers			All	All	All	A, E, F, G, H
Octave[23]	Any meter that accepts Octave registers	4.0C	1.21S	All	All	All	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

McCrometer Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
M-Series Converter[23]	880003051	MCMAG1REV1	3.03.00	All	All		A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Metron Farnier Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
OER[4]	Any meters that accept the OER register			All	All	Single Jet	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Mueller (Hersey) Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
Translator	Any meters that accept the Translator register			All	All	All	A, E, F, G, H
SSR	Any meters that accept the SSR register		3.0.12	All	All	All	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Neptune (Schlumberger) Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
ARB V	Any meters that accept the ARB V register			All	All	All	B, E, G
E-Coder[15]	Any meters that accept the E-Coder register			All	All	All	C, E, F, G, H
ProRead[8] or ProRead AutoDetct[9]	Any meters that accept the ProRead, ProRead Auto Detect register			All	All	All	C, E, F, G, H

B	60W Encoder, Inline Connector	ERW-0771-204
	60W Encoder, 5’ Cable	ERW-0771-214
	60W-R Encoder, Remote	ERW-0771-424
C	60W Encoder, Inline Connector	ERW-0771-205
	60W Encoder, 5’ Cable	ERW-0771-215
	60W-R Encoder, Remote	ERW-0771-425
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

RG3 Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
Tomahawk[20]	RG3			All	All	All	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

RG3 Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
Tomahawk[20]	RG3			All	All	All	A, B, C, D, E

A	60WP Pulser, Inline Connector	ERW-0771-301
	60WP Pulser, 5’ Cable	ERW-0771-311
	60WP-R Pulser, Remote	ERW-0771-423
B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
D	100WP-R Pulser remote, 10” cable	ERW-1300-215
	100WP-R Pulser remote, 10” cables for register and telemetry device	ERW-1300-216
E	100WP-R+ Pulser remote, 10” cable	ERW-1300-315
	100WP-R+ Pulser remote, 10” cables for register and telemetry device	ERW-1300-316

Sensus (Invensys, Rockwell) Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
ER21	Any meters that accept the ER registers		R1.0.04	All	All	All	A, E, F, G, H
ICE7 and ECR7	Any meters that accept the ICE and ECR V registers			All	All	All	A, E, F, G, H
iPERL	iPERL			All	All	Electro Magnetic	E, F, G, H
OMNI	OMNI T2		1.19	1-1/2”	10”	Turbine	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Sensus (Invensys, Rockwell) Pulsers

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
PMM5,6	PMM			All	All	Multi Jet	A, B, C, D, E

A	60WP Pulser, Inline Connector	ERW-0771-301
	60WP Pulser, 5’ Cable	ERW-0771-311
	60WP-R Pulser, Remote	ERW-0771-423
B	100WP Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-208
	100WP Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-209
	100WP Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-211
	100WP Pulser, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-212
	100WP Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-219
	100WP Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-220
C	100WP+ Pulser, integral connectors for register and optional direct connect remote antenna	ERW-1300-308 ERW-1300-408
	100WP+ Pulser, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-309 ERW-1300-409
	100WP+ Pulser, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-311 ERW-1300-411
	100WP+ Pulser, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-312 ERW-1300-412
	100WP+ Pulser, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-319 ERW-1300-419
	100WP+ Pulser, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-320 ERW-1300-420
D	100WP-R Pulser remote, 10” cable	ERW-1300-215
	100WP-R Pulser remote, 10” cables for register and telemetry device	ERW-1300-216
E	100WP-R+ Pulser remote, 10” cable	ERW-1300-315
	100WP-R+ Pulser remote, 10” cables for register and telemetry device	ERW-1300-316

Siemens Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Pulser ERTs By Group
	Mag8000CT-7ME6820[17] Mag8000-7ME6810[17]			All	All	All	E, F, G, H

E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Zenner (Performance) Encoders

Register Model	Meter Model	Hardware Revision	Firmware Revision	Size From	Size To	Meter Type	Compatible Encoder ERTs By Group
ETR	Hendey			All	All	All	A, E, F, G, H

A	60W Encoder, Inline Connector	ERW-0771-202
	60W Encoder, 5’ Cable	ERW-0771-212
	60W-R Encoder, Remote	ERW-0771-422
E	100W Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-202
	100W Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-203
	100W Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-205
	100W Encoder, 5’ cable for register, integral connector for optional telemetry device and direct connect remote antenna	ERW-1300-206
	100W Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-217
	100W Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-218
F	100W+ Encoder, integral connectors for register and optional direct connect remote antenna	ERW-1300-302 ERW-1300-402
	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303 ERW-1300-403
	100W+ Encoder, 5’ cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-305 ERW-1300-405
	100W+ Encoder, 5’ cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306 ERW-1300-406
	100W+ Encoder, 20” cable for register connection, integral connector for optional direct connect remote antenna	ERW-1300-317 ERW-1300-417
	100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318 ERW-1300-418
G	100W-R Encoder remote, 10” cable	ERW-1300-213
	100W-R Encoder remote, 10” cables for register and telemetry device	ERW-1300-214
H	100W-R+ Encoder remote, 10” cable	ERW-1300-313
	100W-R+ Encoder remote, 10” cables for register and telemetry device	ERW-1300-314

Notes:

Compatibility acceptance for the meters and meter registers listed in this document was based on Itron's evaluation of communication integrity and electrical interface over various operating temperatures with specified register hardware and firmware revisions. Meter/register features, accuracy, and reliability were not evaluated.

1. Itron ERT is not compatible with 1-½ inch and 2-inch imperial gallons, US gallons *high speed* and cubic feet *high speed* C700 meters with digital registers.
2. Compatible with Elster AMCO digital registers with tamper reed switch.
3. Badger supplies the cable with RTR for remote.
4. Operational Temperature limited to -10º C to +60º C (14º F to 140º F).
5. For ECR III AMR SYSTEM register on PMM meter, refer to ERT part numbers under Invensys/Sensus.
6. Compatible with Precision PMM registers with four mounting holes that accept Precision's blue housing reed switch assembly with four mounting screws.
7. Compatible with all ECR variants and configurations excluding 8-wheel. Register must be programmed as normal or classic reading string and multiplier. Units of measurement must be disabled.
8. Neptune's ProRead register must be programmed with Neptune ProRead Portable Programmer as follows:

   RF/MIU ID SINGLE
   DC: E65N or E49N UC: X
   ID: X 00

   Where X is noted in the example, whatever value is programmed is irrelevant to the ERT since this information will not be captured in the ERT module's Standard Consumption Message. DC signifies *Dial Code.* Itron suggests model E65N registers be programmed with this value (for example, 6 encoded wheels with the resolution of last encoded wheel being 0 or 5). Itron suggests E49N registers be programmed with this value (for example, 4 encoded wheels with the resolution of last encoded wheel being 0 through 9).
9. Use the same ERT module as ProRead. The ProRead AutoDetect register does not require programming to work with the ERT unless it is connected to an R900 radio module. If the register has been connected to an R900 radio module, reprogram the register to the configuration listed in note 8 before connecting the ERT module.
10. The V100T is the only approved model of the V100 meter family and is only authorized when using the Elster AMCO meter probe From Table A.

Table A. Approved V100 meter model approved for use with the Elster AMCO meter probe

Table A V100 Meter Model Configurations		
Elster AMCO Order Number	**Probe Part Number**	**Description**
2545Q0001	**59600-445-5**	**5ft. cable, no connector**
2545Q0002	**59600-445-ILC**	**5ft. cable with inline connector**
2545Q0003	**59600-635**	**8" cable used for direct mount**
2545Q2452	**59600-445-25**	**25ft. cable, no connector**

Table B. V100T meter configurations approved for use.

Table B Approved V100T Meter Configurations			
Size	**Units**	**Max. Flow**	**Pulse Value**
15mm	m^3	3 cmh	5 liters
	Imp. Gallons	11 gpm	0.5 gallons
	Imp. Gallons	11 gpm	5 gallons
	US Gallons	13.2 gpm	
	ft^3	1.77 cfm	0.5 cu.ft.
20mm	m^3	5 cmh	5 liters
	Imp. Gallons	18.3 gpm	5 gallons
	US Gallons	22 gpm	
	ft^3	2.94 cfm	0.5 cu.ft.
25mm	m^3	7 cmh	5 liters
	Imp. Gallons	25.7 gpm	5 gallons
	US Gallons	30.8 gpm	
	ft^3	4.12 cfm	0.5 cu.ft.
30mm	m^3	12 cmh	50 liters
	Imp. Gallons	44 gpm	5 gallons
	US Gallons	52.8 gpm	
	ft^3	7.06 cfm	0.5 cu.ft.
40mm	Imp. Gallons	73.3 gpm	5 gallons
	US Gallons	88 gpm	
	ft^3	11.77 cfm	0.5 cu.ft.

11 The Cyble Sensor pulser module must be configured with a K factor of 10; therefore, the least significant consumption value is not reported in the ERT Standard Consumption Message (SCM).

12 The Cyble Coder must be programmed for 7 digits. This will prevent the rightmost or leftmost register wheel value from being reported in the ERT Standard Consumption Message (SCM). Ensure the Coder consumption value is programmed to match the meter register value before connecting to the ERT module.

13 Only applies to registers with Elster AMCO protocol.

14 Register housing must be the three-tab design.

15 E-Coder compatibility is limited to the parameters shown in the following table:

ERT Module	E-Coder Compatibility
60W	Can report only up to 6 left-justified digits.
100W	Factory default setting reports up to 6 left-justified digits. 100W modules manufactured after 4/2012 are compatible with 8-digit register output when reprogrammed for Fixed Network mode and Neptune 8-dial configuration.
100W+	Factory default setting reports up to 6 left-justified digits. To read 8-dial register, reprogram using Neptune 8-dial configuration. Note: Will not read a six-dial register after it is reprogrammed to read 8-dials. To re-enable 6-dial operation program using Encoded Register option.

16 HR-E LCD compatibility is dependent on the register firmware revision. See the following HR-E LCD compatibility list:

HR-E-LCD	Compatible ERT Model
6-digit output (before September 2015)	60W, 100W, 100W+, 200WP
6-digit output (after September 2015, firmware version 12)	60W, 200WP
9-digit output	100W+

17 The Siemens Mag800CT-7MEG870 and Mag8000-7ME6810 are Itron-qualified for battery and AC power operation.

18 Register must have visible date code showing manufacturing date of September 2013 (09.13) or later.

19 The Krohne IFC 070 must be programmed to 100ms output. All approved ERT modules must be programmed with the Krohne FDM configuration.

20 The RG3 Tomahawk register is programmable for encoder or pulser. Encoder configurations should be selected based on the model of the endpoint connected. For pulser operation, FDM Endpoint Tools version 3.6 or higher is required to configure the endpoint. Only the leftmost 7 dials will be reported and the endpoint consumption value will increment by one for every 10 meter pulses.

21 Only registers with a manufacturing date of June 2013 or later are approved.

22 The Badger M5000 Mag Meter is approved for the following number of reported digits:

NOTE: Pulser ERTs must be programmed to Badger M5000 7 digit or 100ms Pulse 7 digit driver.

Table C

Table C: Badger M5000 Number of Reported Digits (for listed Itron Module)	
Module	**Number of Reported Digits**
60W	6
60WP, 100W, 100WP	7
100W+	9
100WP+	7

23 Register is approved for use in the following configurations:

Table D

Table D: Register Configuration	
ERT Module	**Register Configuration**
60W	6 (or less) left most digits.
100W	7 (or less) left most digits.
100W+	10 (or less) left most digits.

24 100W/100W+ Series and 60 Series modules are FCC and Measurement Canada approved.

25 The Cadillac Meter is approved for use in the following configurations.

Itron Configurations: Cadillac Meter (Flow Units: Gal/Min and Gallons) for 60WP and 100WP/+							
	B: Display		C: Range	H: DO	J: Count/Pulse		
Size	Display 1	Display 2	R1	DO1 Function	Count Rate	Pulse Mode	Pulse Width
0.5” Thru 6”	gal/min	Count F	5 m/s	PLS Out	10 gal	Auto	100 ms
8” thru 24”	gal/min	Count F	5 m/s	PLS Out	100 gal	Auto	100 ms
28” thru 36”	gal/min	Count F	5 m/s	PLS Out	1000 gal	Auto	100 ms

Itron Configurations: Cadillac Meter (Flow Units: Ft3/Min and Ft3) for 60WP and 100WP/+							
	B: Display		C: Range	H: DO	J: Count/Pulse		
Size	Display 1	Display 2	R1	DO1 Function	Count Rate	Pulse Mode	Pulse Width
0.5” Thru 20”	gal/min	Count F	5 m/s	PLS Out	10 Ft3	Auto	100 ms
24” thru 36”	gal/min	Count F	5 m/s	PLS Out	100 Ft3	Auto	100 ms

- R1, which is meter flow span setting, is determined by using approximately 5 m/s as maximum system design velocity.
- When Pulse Mode is set to Auto the default for Pulse Width becomes 100 ms.
- Count Rate (Pulse scaling factor) can always be larger than what is listed for any given meter size, just not smaller and meet 100 ms pulse width.
- Pulser ERTs must be programmed to 100ms Pulse 7 digit driver.

26 AquaMaster III Programming Command Settings (6 left most digits sent)

- Go to Menu – 5.0 Flow Settings – Set flow to appropriate units.

60W and 100W Adjust the following patameters:						
Size	**Meter Units**	**Meter Multiplier**	**Output Type**	**Message Type**	**Digits Sent**	**Display Label**
US Gallons						
1/2" to 1"	> 37 = 5	> 38 = 1	> 324 = 1	> 326 = 0	> 327 = 3	N/A
1 1/2" to 3"	> 37 = 0 Special	> 38 = 26.4172	> 324 = 1	> 326 = 0	> 327 = 3	x 10 US Gal
4" to 14"	> 37 = 0 Special	> 38 = 2.64173	> 324 = 1	> 326 = 0	> 327 = 3	x 100 US Gal
16" to 24"	> 37 = 0 Special	> 38 = .264174	> 324 = 1	> 326 = 0	> 327 = 3	x 1000 US Gal
Cubic Feet						
1/2" to 3"	> 37 = 4	> 38 = 1	> 324 = 1	> 326 = 0	> 327 = 3	N/A
4" to 10"	> 37 = 0 Special	> 38 = 353.147	> 324 = 1	> 326 = 0	> 327 = 3	x 10 FT^3
12" to 24"	> 37 = 0 Special	> 38 = 35.3147	> 324 = 1	> 326 = 0	> 327 = 3	x 100 FT^3
Cubic Meters						
1/2" to 20"	> 37 = 2	> 38 = 1	> 324 = 1	> 326 = 0	> 327 = 3	N/A
24"	> 37 = 0 Special	> 38 = 10	> 324 = 1	> 326 = 0	> 327 = 3	x 10 M^3

200WM/200WP Remote Endpoints

This section lists meter types compatible with Itron 1.4 GHz water endpoint modules.

Note Itron reserves the right to change product, system specifications, and meter compatibility without advance notice.

Table D: Approved Meter Configurations

Meter Manufacturer	Meter Register Types	Approved Meters	Notes
Elster AMCO	Encoder: Scancoder, InVISION, Aqua Master, evoQ4, Pulser: Digital, V100T	**See file attachment in left pane for approved meter register listing**	**1, 2, 7**
Badger	Pulser: RTR Encoded: ADE E-Series: ADE HR-E-LCD		**3**
Sensus/Invensys/Precision	Pulser: PMM (with 4-hole blue reed switch housing) Encoded: ICE, ECR III, ECR, ECR WP, AMR System, TR-PL iPERL		**4, 5**
Hersey/Mueller	Encoded: Translator		
Metron Farnier	Encoded: OER		
Neptune/Schlumberger	Encoded: ProRead, ProRead Auto Detect, ARB V, E-Coder		**6, 8**
Itron/Actaris	Pulser: Cyble Sensor K10 Encoder: Cyble Coder		
Hendy Performance Meter	Encoder: ETR		
Severn/Trent	Encoder: SmartMeter - Sensus Protocol		
SeS Siemens	Mag8000CT - 7ME6820		

Notes:

1. Itron not compatible with 1-½ inch and 2 inch imperial gallons, US gallons *high speed* and cubic feet *high speed* C700 meters with Elster AMCO Digital registers.
2. Compatible with Elster AMCO Digital registers with tamper reed switch.
3. Badger supplies cable with RTR for remote.
4. For ECR III AMR SYSTEM register on PMM meter, refer to ERT part numbers under Invensys/Sensus.
5. Compatible with Precision PMM registers with four mounting holes that accept Precision's blue housing reed switch assembly with four mounting screws.
6. Neptune's ProRead register must be programmed with the Neptune ProRead Portable Programmer as follows:

   RF/MIU ID SINGLE
   DC: E65N or E49N UC: X
   ID: X 00

   DC Signifies *Dial Code.* Itron suggests model E65N registers be programmed with this value (for example, 6 encoded wheels with the resolution of last encoded wheel being 0 or 5). Itron suggests E49N registers be programmed with this value (for example, 4 encoded wheels with the resolution of last encoded wheel being 0 through 9.)

7. Only applies to registers with Elster AMCO protocol.
8. The E-Coder is compatible with registers configured for 6-digit ProRead output as well as E-Coder Plus functionality with an 8-digit output. Only E-Coder registers made after 2006 are qualified for use with Itron endpoints.

Telemetry Devices

Table E: Approved Telemetry Devices			
Device Manufacturer	**Device Model**	**ERT Type**	**Part Number**
United Systems Corporation (USC)	WCV100	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303
			ERW-1300-403
		100W+ Encoder, 5’cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306
			ERW-1300-406
		100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318
			ERW-1300-418
Smart Earth Technologies (SET)	SETflow™ 100	100W+ Encoder, integral connectors for register and optional telemetry device and direct mount remote antenna	ERW-1300-303
			ERW-1300-403
		100W+ Encoder, 5’cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-306
			ERW-1300-406
		100W+ Encoder, 20” cable for register, integral connectors for optional telemetry device and direct connect remote antenna	ERW-1300-318
			ERW-1300-418

THIS IS A SAMPLE SAT WHICH WILL BE MODIFIED TO MEET THE REQUIREMENTS OF THE PROPOSED SOLUTION.

SYSTEM ACCEPTANCE TEST PLAN

STANDARD SYSTEM ACCEPTANCE TEST ("SAT")

This document outlines the following:

- The equipment needed to conduct a successful SAT;
- Pre-test requirements; and
- System specific SAT tests used to verify the functionality, accuracy and reliability of Tantalus's AMI System.

NETWORK EQUIPMENT REQUIREMENTS

At a minimum, the following Tantalus system components need to be installed for a successful SAT to take place:

- At least (X) installed Tantalus electric endpoints will be required for this test. Of these (X), at least X will be new single-phase Itron Centron meters requiring the Tantalus TC-1216/TC-1220-RD and at least X (are required) will be poly-phase new Itron Sentinel meters requiring the Tantalus PP-1316.
- (X) IP-Based collector. Tantalus shall use the backhaul communication network provided by UTILITY to the collector.
- (1) TUNet Control Center
- (X) LAN Repeater (TR-1901 or TR-1905)

PRE-TEST REQUIREMENTS

The following requirements must be met before this SAT can take place:

- All Tantalus equipment is to be setup according to design specifications as per Tantalus Personnel.
- The location of at least one IP-Based Network Collector needs to be finalized by UTILITY and approved by Tantalus. All equipment and ancillary items (Antenna, Cabling, Grounding, etc.) needs to be in place and installed.
- An appropriate backhaul communication network must be established by UTILITY to the Network Controller that is reachable by the TUNet Control Center.
- The area containing the electric endpoints needs to be identified and the quantity of each meter type and all other necessary items need to be specified to Tantalus and the meter distributor.
- Purchase orders to Tantalus and the meter distributor need to be issued for all required items.

SPECIFIC SYSTEM ACCEPTANCE TESTS

The following tests will be performed to verify the functionality of the Tantalus AMI system:

1. Network Operations, LAN, TC-1216, TC-1220-RD, PP-1316, and all Tantalus-equipped meters. Installation and Association

Objective:	Verify that Tantalus-equipped meters complete a normal network acquisition and provide the expected LED status indication from power up through to association with the NS.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop. Meters will be selected to test any meter form and at least one (1) IP-Based Collector.
Method:	This test will entail installing Tantalus-equipped LAN meters that are not connected to a Transceiver. 24 hours after installation, an operator will use the Network Administrator web interface of the Network Server to verify the association status of the Tantalus-equipped meter. By using the Network Admin → LAN Device → Update Device screen, the operator can view the association status, including date and time of association and the reported hardware and firmware versions.
Success Criteria:	The Tantalus-equipped meter will associate with the network within 24 hours from the installation time.

2. Advanced Metering, Meter Activation

Objective:	Verify that newly installed meters begin delivering properly time stamped consumption data and power quality data at their set intervals within 24 hours after the installation.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop.
Method:	Delivery of periodic consumption readings may take up to 24 hours to be reported following initial meter installation/association. A new meter will be installed and the meter serial number and time of installation noted. Up to 24 hours following installation, an operator, using the Network Server Utility Administrator web interface, will search for the meter serial number and verify that the meter is delivering consumption data by viewing the latest reading reported by the meter and the related consumption graph.
Success Criteria:	The meters must send the first consumption data and power quality data within 24 hours of the meter installation. The data must be time stamped with the correct system time.

3. On-Request Meter/ Voltage Reading

Objective:	Verify that an operator can select any meter connected to Tantalus and request an immediate update of the meter reading, voltage and view the current reading.
Setup:	At the discretion of the customer, this test may either be done at selected consumer service locations or using a test meter socket in the customer's shop.
Method:	Using the Network Server Utility Administrator web interface, an operator will select one or more meters of each meter form from the test meter socket or, if field tested, field installed base of meters for each Transceiver type and request an updated reading from the selected meter(s) and then view the updated reading noting the updated timestamp on the consumption reading. The response time will be measured and recorded. If the customer chooses to test meter(s) in the field, A field worker will reside at the physical location of each meter tested and verify the readings viewed by the Network Server operator.
Success Criteria:	The operator will view all the readings update from all the meters selected via the Network Server in less than 120 seconds from the time the request was submitted. Accuracy of the remote reading will be checked at the meter site during this test. If field tested, the operator will verify the reading with the field worker at the meters physical location and this test is satisfied for all transceivers installed.

4. Consumption and Voltage Profiles

Objective:	Verify that both the kWh readings and the voltage readings can be displayed in graphical form for any residential meter on any selected date and that kWh, kVARh (as applicable), and voltage readings can be displayed in graphical form for any commercial or industrial meter.
Setup:	At the discretion of the customer, this test may either be done using selected consumer service locations or using a test meter socket in the customer's shop. The meters used in this test must be in operation for at least 2 complete days before this test is conducted.
Method:	Using the Network Server Utility Administrator web interface, an operator will select one or more meters of each meter form from the installed base of test meters and view the graphed consumption, voltage readings, and kVARh (as applicable) readings. The graphs will be viewed for a minimum of two selected dates. If field meters are tested, meters will be chosen to test any Transceiver type installed.
Success Criteria:	The graphs display consumption and voltage for all 24 hours for residential meters. The graphs display kWh, kVARh (as applicable), and voltage for all 15-minute intervals (grouped hourly) in 24 hours for all commercial and Industrial meters of the selected days. All the graphed data accurately represents the consumption and voltage. During this process, the operator must be trained on how to change the meter interval and hence the graphed meter interval for all data above to 5 minutes for a commercial or industrial meter and 15 minutes for a residential meter.

5. Outage and Restoration Detection

Objective:	Verify that a Tantalus-equipped meter, not directly connected to a WAN transceiver, reports a power outage immediately on occurrence and reports power restoration immediately on occurrence.
Setup:	This test will entail simulating a power outage by turning off power to a Tantalus-equipped meter fitted to a test meter socket in the customer's shop and/or, if the customer so chooses, after the test this feature will be successfully demonstrated using a sample of installed meters of all forms at customer homes or businesses.
Method:	A clock or watch that will be used to track the times of outage and restoration must be synchronized to Tantalus. Using the Network Server Utility Administrator web interface, an operator will monitor the Event monitor window for power outage events. Power to the meters will be shut off and the time will be recorded. The operator will look for the respective outage event to appear in the Event monitor and record the time the event appeared and note the time stamp associated with the outage. The power to the meters shall be left off for at least 5 minutes to ensure the meter module's capacitors have fully discharged, then power will be restored and the time of restoration will be recorded. The operator will look for the respective outage event to clear (i.e. power restoration) in the TUNet Monitor and record the time the event cleared and note the time stamp associated with the restoration. Multiple meters may be tested at the same time whether tested in the shop or in the field.
Success Criteria:	The outage event for all meters will appear within 2 minutes of occurrence and the restoration event (outage clearing) will occur within 10 minutes after the power has been restored to the meters. The time stamps of both events for a particular meter should match the recorded times of the respective power outage and restoration actions, within ± 1 second.

At the discretion of the customer, any of the above tests may be repeated. Once a test has been successfully performed and every required test (not just one particular test) has been signed off in the Tantalus SAT Record (Appendix A), it will be considered complete. The term test should not be misconstrued to be a one-time occurrence. The system should perform to the test level 90% of the time. Therefore, Tantalus cannot continue to try to pass a test until it does and construe this performance as passing any of the tests performed unless there is a technically reason why the test could not be successfully performed (e.g. device under test not connected).

Upon signing off all tests in the Tantalus SAT Record, the UTILITY and Tantalus will sign the Tantalus System Acceptance Test Certificate (Appendix B) indicating that the system acceptance tests have been completed and that all requirements of the Milestones defined in Section 1.14 of the General Terms and Conditions of Agreement dated (XXXX) were met and all tests passed.

Note: Production acquisition and full deployment of meters and supporting equipment are dependent upon successful SAT completion and acceptance by the customer.

ROW #	Reference Contract #	Tantalus Test #	Description	Date Tested	Pass / Fail	Notes	Initials
1		1	Network Operations, General, Time Synchronization				
2		2	Advanced Metering, Meter Activation				
3		3	On-Request Meter/Voltage Reading				
4		4	Consumption and Voltage Profiles				
5		5	Outage and Restoration Detection				

Tantalus Utility Network (TUNet®)

System Acceptance Test Certificate

Pursuant to the Tantalus System Acceptance Test Plan, as mutually agreed to between Tantalus Systems Inc. and UTILITY NAME HERE., this certificate recognizes that on the __ day of _____, 20__, the complete set of system acceptance tests have passed and that the commissioned Tantalus Utility Network has been accepted.

Tantalus Systems Inc.	**UTILITY NAME HERE.** Customer
_____ Signature	_____ Signature
_____ Name	_____ Name
_____ Title	_____ Title
_____ Date	_____ Date

Agenda Item: NB-12
Date: 08-05-2021

City Council Agenda Item Request

Date: July 26, 2021

Name: Roxanne Spencer

Department: Planning & Zoning

Item: Historic Preservation Presentation

Meeting date requested: August 5, 2021

Explanation for request:

The City of Escanaba has been awarded a Community Partnership Program award by the State Historic Preservation Office (SHPO) for a historic resource survey of the Ogden Triangle area. Alan Higgins of the SHPO office will give a brief presentation on the survey project scope and explain how the survey information could potentially be used for future historic preservation activities.