



Deployment of ArcGIS Enterprise, Utility Network, and Cityworks AMS

Mission Springs Water
District (MSWD)

January 11th, 2024

Proposal Submitted by:

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COVER LETTER

January 11, 2024

Kurt Kettenacker
IT Manager
Mission Springs Water District (MSWD)
66575 2nd Street
Desert Hot Springs, CA 92240

Dear Mr. Kettenacker:

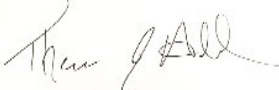
Axim Geospatial, LLC, an NV5 Company, (Axim) confirms that all elements of the RFP have been reviewed and understood and intends to perform all services for the Complete Deployment of ArcGIS Enterprise, Utility Network, Cityworks project. For over 31 years, Axim's core business has been location technology. We are the largest singular provider of end-to-end geospatial services and solutions in the U.S. serving the communities in which we live.

Brief Summary of Axim's Qualifications and Why to Select Us:

- **Most Qualified Water and Wastewater Utilities Experience** – Axim is an Esri Platinum Partner, currently serving over 40 water utilities and was the first Esri business partner with a water utility focus to earn the Utility Network Management Specialty Designation. Axim's unmatched experience in the Utility Network involves several large organizations including City of Houston, Charlotte Water, Austin Water, Eastern Municipal Water District, and several others.
- **Most qualified & Low-Risk Selection** - Axim participates in both the Esri Partner Advisory Committee (PAC) and Esri Chief Technology Officer (CTO) Council, allowing us unparalleled representation for our clients and an opportunity to influence the trajectory of the various technology stacks. And, through this partnership, we gain access to early insights that allow Axim to position our clients for advances that may not yet be formally released.
- **Breadth and Depth of Experience** – With access to over 1,300 geospatial professionals, Axim is prepared to handle all aspects of the project and minimize system disruptions and downtime to users. Axim is known for our unmatched, personalized level of service across the country and our approach allows for increased collaboration across business units allowing MSWD to continue their commitment to provide consistent practices to make better decisions and streamline business operations. Working closely together, we will turn this project into a huge success story for your team and your customers.

Axim is willing to enter into a contract under the terms and conditions prescribed by this RFP and in the Sample Agreement. We look forward to your favorable review of our proposal and to working together for the successful accomplishment of this project. Please reach out to me as the single person of contact during the RFP review process.

Sincerely,



Theron Hodel
Account Manager, Axim Geospatial
theron.hodel@aximgeo.com

STATEMENT OF UNDERSTANDING AND APPROACH

Statement of Understanding

Axim is fully committed to embracing the principles and values upheld by Mission Springs Water District (MSWD) in safeguarding and maintaining the vital resource of water. The vision of MSWD as a trailblazer and innovator in the water industry deeply resonates with Axim's core values of promoting innovation and setting high industry standards. We acknowledge the significance of employing highly qualified, innovative, and collaborative individuals who strive for excellence while working together seamlessly as a team.

Our comprehensive understanding of the project elements, specifications, and anticipated outcomes outlined in the RFP underscores our dedication to the seven fundamental values of professionalism, accountability, respect, integrity, servant attitude, excellence, and stewardship, all upheld by MSWD. We acknowledge the complexity of the proposed scope of work and emphasize the importance of meticulous planning, execution, and ongoing support to fulfill MSWD's GIS requirements and future objectives. The scope encompasses multiple project components to establish an ArcGIS environment, transition existing GIS data into the Utility Network, implement Cityworks, and provide ongoing staff augmentation services for sustained GIS management and support. MSWD can centralize its GIS operations by establishing this environment, allowing for better data integration, collaboration, and scalability. This will provide a robust framework for deploying and managing GIS applications, ensuring security, scalability, and customization tailored to MSWD's needs. Migrating existing data to the new environment and into the ArcGIS Utility Network provides advanced functionalities like traceability, network analysis, and real-time monitoring, which enhances data management and improves decision-making, leading to more efficient and effective management. Implementing Cityworks will significantly enhance MSWD's ability to adequately manage and maintain its assets. This will allow for streamlined workflows, predictive maintenance, resource optimization, and better decision-making by integrating GIS data with asset management processes. Providing staff augmentation services for ongoing GIS management and support ensures that MSWD has access to skilled GIS professionals who can provide ongoing support, troubleshoot issues, perform updates, and implement new functionalities, ensuring smooth operations and allowing internal MSWD staff to focus on core tasks. These components create a robust GIS infrastructure enabling efficient data management, streamlined workflows, enhanced decision-making, and continuous support, ultimately contributing to improved organizational efficiency. Our understanding of the project aligns with the importance of thorough planning, execution, and continual support to meet MSWD's GIS requirements and future objectives.

Approach

Mission Springs Water District noted the requested scope of work is quite complex. While acknowledging the complexities and intricacies of individual tasks, the overall project endeavor can be summarized into distinct logical subprojects or components that lay out a more generalized effort. At its simplest, MSWD looks to establish an ArcGIS Enterprise platform hosted in the Cloud and convert existing asset spatial data into the ArcGIS Utility Network (UN), upon which the District will build its Cityworks asset management system to replace the current Nobel Geoviewer and Epture ManagerPlus systems. With a limited staff, the District also seeks ad hoc geospatial support for various potential tasks, including possible additional system integrations. The outlined approach begins with establishing the technical architecture and converting existing datasets before implementing the new Cityworks asset management system. MSWD is looking for a trusted vendor to facilitate re-implementing its GIS program foundation with an eye for modernization and future integrations. Current project components include:

- Deploy and Manage ArcGIS Enterprise and AWS Cloud Architecture
- Migrate Spatial Data (landbase)
- Implement ArcGIS Utility Network (water, wastewater)
- Implement Cityworks Asset Management System
- Staff Augmentation

Esri's ArcGIS Enterprise provides a complete, modern software system for accessing, analyzing, and sharing geospatial data. The platform provides a technical foundation incorporating database, application, and web servers to serve client software and applications supporting an organization's business processes. Axim will first establish MSWD's base Esri ArcGIS Enterprise deployment within the Amazon Web Services (AWS) environment, including an enterprise geodatabase, ArcGIS Server, ArcGIS Portal, and web adaptor. We also plan to deploy and manage an additional ArcGIS Server dedicated to the ArcGIS Utility Network. Axim will provision all necessary AWS servers and configure the Esri software. As part of ongoing managed services, Axim will manage the Cloud architecture and Esri base deployment as needed to maintain security, performance, and software patches. Once the technical architecture is in place, Axim will shift our focus to preparing the data tier.

Axim will review and convert the District's spatial data from the current shapefile and personal geodatabase formats. We will prepare FME workbenches to extract, transform, and load (ETL) the exported formats into file geodatabase (FGDB) and apply quality checks to ensure data was migrated correctly. Then, the water and wastewater assets will be temporarily converted into a transitional FGDB in preparation for the ArcGIS Utility Network. At the same time, the landbase datasets will be directly converted and loaded into an enterprise geodatabase.

Implementation of the ArcGIS Utility Network must be understood as a complete product implementation, which also requires data conversion. It is not simply a data migration. To this end, Axim will review and evaluate MSWD's water and wastewater datasets to identify data that must be cleaned before full conversion. We will then map source datasets into Esri's respective UN base models and review the mappings for District approval before building ETL tools to convert source data into those models. We will perform a pilot UN implementation in a file geodatabase and provide knowledge transfer to MSWD staff for UN functional testing. MSWD staff will verify that data was correctly converted from the source datasets. Axim will also update the ArcGIS Pro templates for use with MSWD UN data. With the expectation that Esri's base UN models will suffice for District needs with no changes, limited functional testing should be required. Still, MSWD staff will want to verify network management rules and tracing perform as expected. After a review period and any revisions, Axim will deploy each UN into the enterprise environment and prepare for production release.

Once the initial design for each UN is agreed upon, Axim and the District are ready to begin planning for the Cityworks implementation. Axim understands that MSWD envisions Cityworks as the primary GIS interface for most end-users and the primary EAM and CMMS functionalities provider. We will coordinate the deliverables from other project components with current workflows and supporting business processes requirements to configure a robust and custom Cityworks AMS implementation. Leveraging feature services published from the migrated landbase and network assets, Axim will collaboratively design and develop the Cityworks AMS site in a lower-tier environment hosted in Cityworks Online (CWOL). In parallel, the Axim team will leverage FME to migrate work order and asset history data from GeoViewer into Cityworks. Once Axim understands how the District envisions integrating Cityworks with Cues GraniteNet and DigAlert, development of these third-party software integrations may also take place

during this time. Following the successful development of Cityworks AMS and internal testing, Axim will travel onsite to MSWD to provide preliminary user training, preparing District staff for acceptance testing. Once the District signs off on testing results and any revisions, Axim will prepare Cityworks for release into the production tier and facilitate five (5) days of End User and Administrative training to prepare for an immediate Go-Live after that.

The primary components of this project include establishing the ArcGIS Enterprise technical architecture, migrating the landbase datasets, implementing the ArcGIS Utility Network for water and wastewater, and configuring Cityworks AMS to provide the EAM and CMMS functions. These enterprise business systems represent a significant leap forward in the capability and complexity of the MSWD GIS program which currently lacks a full-time GIS Specialist. MSWD expects to need support for ad hoc GIS tasking in consideration of future initiatives. Axim is including our rates for time-and-materials support along with a prepaid support option. These rates are available to MSWD to request our technical expertise for various District needs that may not yet be realized. Tasking can be requested by and coordinated through the MSWD and Axim project managers.

As mentioned, the five project components outline the major milestones and offer a high-level view of the project organization, sequence, and dependencies. Our proposal follows a chronological narrative of our project approach. Each phase is essentially dependent on the successful completion of the predecessor and, as such, will be considered to occur in strict sequence unless otherwise coordinated and mutually agreed upon. Once the initial UN pilot is completed and the final database design is decided, Cityworks reconfiguration planning steps may begin. The following sections describe our overall project management approach and details of each project component.

Project Management Approach

Axim employs two interwoven tracks to help ensure success. First, we bring a proven project management approach that helps establish controls and ensure communications and delivery. Second, we bring a technical approach tailored to the scope of services through which our expertise is translated into solutions. The following sections provide an overview of our project management approach and a task-level breakdown of the technical approach.

Each project engagement with Axim is structured according to five phases that have proven adaptable and repeatable and can reliably produce successful results. In each component of the proposed project, we will leverage these five phases established to manage the overarching project and provide the structured approach necessary to guide the successful execution of each task.

- *Planning & Analysis:* The Planning & Analysis phase starts our project lifecycle and sets the broad execution parameters. It is communication-centric, beginning with the project kickoff meeting and scheduling the project reviews. In collaboration with MSWD, Axim will review the project's budget and schedule and establish project controls, including a client satisfaction survey when the project is complete. As part of each project review meeting, Axim will have a standing agenda adapted with specific content as appropriate, and will prepare a summary status report document each month that includes detailed information on the schedule and progress against milestones and deliverables. As risks are identified, the collective team will discuss mitigation strategies as proactively as possible to help streamline execution and optimize the experience. In addition to recurring meetings and ongoing monitoring, Axim will focus on responsive communication throughout the engagement, to include day-to-day correspondence and facilitation. We believe that communication is often equal to technical delivery in shaping a positive project experience

for the collective team.

- *Design*: The Design phase is the point in the project during which our team gathers information and documentation to guide the course of the effort. We will focus on establishing the background that will drive the project forward, which is a critical step before moving on to the development process. Axim will work with MSWD on relevant considerations such as functional requirements, database design, configuration requirements, system architecture, and compiling or creating all associated documentation, which will be reviewed and approved by MSWD staff. The specific approach to gather requirements will be tailored to the project to ensure the most cost effective, productive, and accurate result, which may include phone discussions, demonstrations, workshops, or onsite interviews and working sessions.
- *Development*: Although this is not a traditional *development* project, in the sense of coding or programming, we consider Development to encompass more generically the core effort of a project that centers on the primary deliverables. Development can also be considered a reference to the environment, in a way, since much of the work completed within this phase is often carried out in a lower tier from any production system to mitigate the potential for end-user disruption.
- *Testing & Acceptance*: Testing and Acceptance will imply a narrower development-centric perspective. This phase addresses all aspects of QA/QC, deliverable review, and acceptance. This includes time to orient power users to the new system for adequate testing. This phase is vital and distributed into each task, with each core deliverable undergoing an internal and external review before eventual acceptance.
- *Implementation*: Implementation is incorporated into each phase and refers to finalizing, presenting, and distributing all deliverables. Certain aspects or tasks of the Development Phase may be repeated to construct the necessary target environment. Still, much of the core deployment effort will be specific to the system or product(s) being released. A vital part of the Implementation phase may be a more formalized orientation for users to the new environment.

Approach Project Component 1: ArcGIS Enterprise Cloud Deployment

Through the requested scope of work, MSWD aspires to transition from an established but foundational GIS into a Cloud-hosted enterprise program capable of supporting the evolving business and technology requirements. The vision conveyed within the RFP is aligned with contemporary deployment patterns and represents a significant advancement in adopting location technology for the District.

Enterprise GIS programs vary widely in design, deployment, and adoption pattern, even while each may be guided by industry best practices or recommended practices. As a Platinum Esri business partner, Axim has supported local governments, Federal government agencies, and Fortune 500 companies in migrating and supporting Cloud-based enterprise GIS implementations, and, as such, we are intimate with applying and adapting best practices to organizational requirements. Further, Axim has achieved the Esri ArcGIS Cloud Services specialty designation and we have an established Select Tier Partnership with AWS along with certified AWS Cloud Practitioner staff and in 2023 received Esri's Cloud System Implementation Award.

The following sections outline our approach to both the initial setup and migration of the host Cloud environment and the subsequent ongoing geospatial Cloud management services.

Cloud Implementation & Migration

Axim acknowledges the MSWD request for a secure, performant, and reliable system developed according to industry best practices with support for disaster recovery. Full best practices, however, are often achieved over time and according to business justification. Given the limited footprint of the current GIS

program, Axim is proposing an adaptation of best practices to serve as a robust yet incremental and practical step for MSWD.

Whereas best practices dictate a multi-tiered environment (e.g., development, staging, production) to support release management and physical separation of content, workflows, and software, we believe a single tier for the initial deployment would well support MSWD. Additional tiers can be added as adoption increases, budget affords, or business requirements demand. Likewise, optimal fault tolerance strategies often require redundancy in architectural elements (e.g., servers, functional roles) and corresponding workflows, which adds to the cost and administrative overhead.

Accordingly, Axim is proposing an approach and deployment pattern considering both MSWD requirements and industry best practices but also adapting to anticipated needs based on the current and near-term state of the program. With that said, and based on our experience with similar clients, we are also proposing an entirely scalable approach to accommodate continued growth. MSWD will be able to introduce Cloud and enterprise functionality as desired.

The following sections outline our proposed scope of work, organized according to the five-step project management framework introduced above.

Planning & Analysis

As previously described, Planning & Analysis will begin upon project award and continue through to project acceptance and closure. Beginning with project initiation and kick-off, Axim will collaborate with MSWD to introduce the teams and establish the parameters of execution and delivery, including the cadence of status meetings and associated reporting.

Deliverables

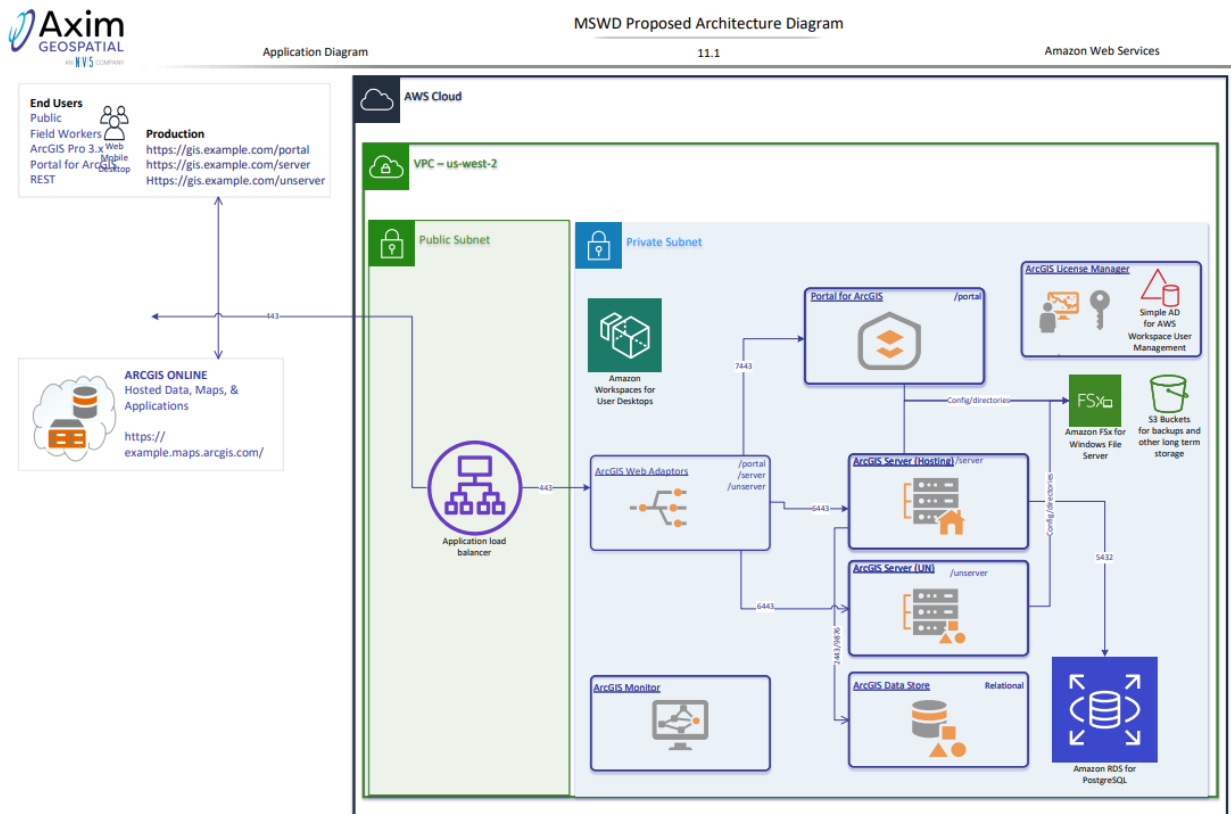
- Kick-off Agenda/Minutes
- Communication Plan
- Bi-weekly (every 14-days) Status Syncs
- Monthly Status Reports

Design

For purposes of estimation and proposal, we have identified an approach and deployment pattern tailored to MSWD based on our prior experience and anticipated near-term organizational requirements. Yet, we also understand that no two organizations are the same and that our clients may not accurately reflect the objectives of MSWD. Accordingly, we have incorporated a discovery element into the Design phase.

Axim will facilitate up to four virtual discovery sessions of up to one hour each to review requirements, orient to MSWD conventions, finalize the Cloud implementation strategy, and validate or refine our designs as appropriate. MSWD participation in the discovery sessions may vary by topic but should typically be limited to three to five people with knowledge and authority to influence the implementation.

Following the discovery, Axim will translate observations and inputs into concise summary documentation and offer a final recommendation for the architecture and deployment pattern. Should the final recommendation deviate from what was used to guide this proposal, the team will communicate the changes and the corresponding impacts to scope, budget, and schedule.



For this submission, Axim has identified a target deployment pattern based on a combination of the RFP inputs and our experience. The recommended pattern for the initial implementation is illustrated in the figure above. Note that Cityworks Online (CWOL) resides on its own AWS instances and is therefore not included in the diagram.

Axim is proposing to leverage AWS as the Cloud hosting platform. However, we have equal familiarity and proficiency with Azure should MSWD prefer (pricing may vary, though typically the difference is nominal). The target specifications associated with the architecture illustrated above are captured in the table that follows:

Service	Specifications	Software Installed
Web Server	t3.xlarge (4vCPU, 16GiB Memory, 120GB Storage)	IIS, ArcGIS WebAdaptors
Portal Server	m5.2xlarge (8vCPU, 32 GiB Memory, 120GB Storage)	Portal for ArcGIS
Hosted GIS Server	m5.2xlarge (8vCPU, 32 GiB Memory, 120GB Storage)	ArcGIS Server
UN GIS Server	rgi.2xlarge (8vCPU, 64GiB Memory, 120GB Storage)	ArcGIS Server with Utility Network
DataStore Server	m5.2xlarge (8vCPU, 32 GiB Memory, 120GB Storage)	ArcGIS DataStore (Relational)
LM Server	t3.xlarge (4vCPU, 16GiB Memory, 120GB Storage)	Esri's License Manager

Monitor Server	M5.xlarge (4vCPU, 16GiB Memory, 120GB Storage)	ArcGIS Monitor
Amazon RDS for PostgreSQL	Db.m3.xlarge (4vCPU, 15GiB Memory, 120 GB Storage)	Enterprise Geodatabase
File Server	SSD Storage, 500GB capacity and backup	Amazon FSx for Windows File Server
Desktops	PowerPro (8vCPU, 32GB Memory, 100GB Root Storage)	3 Windows OS Workspaces
Includes Application Load Balancer, Web Application Firewall, Elastic IP's, NAT Gateway, Managed AD (AWS Directory Service), and Network Load Balancer		

Deliverables

- Up to Four Virtual Discovery Sessions of Up to One Hour Each
- Concise Summary Documentation
- Final Design Recommendation
- Quantified Impacts on Budget and Schedule (if any)

Development

During the Development phase, Axim will translate the final and mutually approved system, as determined in the Design phase, into a functional, Cloud-based, enterprise GIS platform. The focus of this phase and the overarching objective of Project Component 1 is to establish the host environment, including provisioning the Cloud servers/instances, configuring the technical environment, and deploying ArcGIS Enterprise.

As depicted, we have proposed a single tier (production only) with a distributed deployment pattern. Ideally, in the future and as justified by utilization, MSWD may consider introducing lower-tier environments, which can be done without impacting the proposed environment. The distributed deployment pattern conforms to Esri's best practices to separate the elements of ArcGIS Enterprise into dedicated instances to support enhanced performance and scalability.

As part of the AWS environment build-out, Axim will perform the following tasks to create the production tier environment:

- Cloud server/service provisioning
- Cloud framework configuration – gateway, VPC, IP, storage
- Server to server configuration
- Configure instance backups
- ArcGIS Enterprise deployment (anticipated version 11.1)
 - Web Adaptor
 - Portal for ArcGIS
 - ArcGIS Server (core and UN)
 - ArcGIS Data Store
- Federation/Authentication – ArcGIS SAML & Built-in Authentication
- Configure file share – across all VMs
- Install ArcGIS Monitor
 - Configuration occurs in a later project after services/solutions have been configured
 - Time to configure will be covered at the hourly rates specified for staff augmentation
- Provision up to 2 AWS workspaces – ArcGIS Desktop and/or ArcGIS Pro Workspaces

- Install SQL Server using client provided licenses and create an empty ArcGIS Enterprise Geodatabase
- Obtain and apply SSL certificate for the web tier – Axim provisioned certificates (GoDaddy)
- Obtain and apply antivirus protection – Axim provisioned (Cylance)

Deliverables

- Functional production GIS environment within the AWS platform

Testing & Acceptance

Testing & Acceptance of the environment is a streamlined process of functional validation to demonstrate capability and accessibility. Axim will first validate the configuration internally according to a standards-based approach. Additionally, since no MSWD content will be hosted in the environment at this point, Axim will upload a small sample dataset, which will be published as a service and configured into a basic web map to confirm system function. MSWD will also have the opportunity to view and access the temporary QA/QC content and provide feedback before acceptance.

Deliverables

- Two test services
- Internal and client validation of environmental functionality

Implementation

The Implementation phase, as introduced above, centers on the delivery and release of the technical scope elements into production. Given that Project Component 1 targets the setup and configuration of a host environment (without content) and that we are proposing a single tier (production) for this phase, Implementation will primarily focus on staff orientation and knowledge transfer related to the new enterprise GIS environment. Axim will provide a one-hour virtual session to introduce designated MSWD staff to the Cloud environment and review the configuration and access processes. Following the knowledge transfer, we will make any final adjustments to the documentation to reflect the as-built system for delivery to MSWD.

Deliverables

- One-hour virtual knowledge transfer
- Final system documentation

Geospatial Cloud Services (Ongoing Managed Services)

Axim has been delivering Cloud-based, Esri-centric services for nearly 15 years, providing clients with highly varied offerings and managed services, ranging from simple, consolidated deployment patterns to robust, fault-tolerant, and highly available systems. Within the context of our managed services, all software licensing, data, and content (e.g., map services, applications) will be procured or provided by MSWD and hosted in the Cloud environment established in the previous phase.

Geospatial Cloud Services (GCS) begin as soon as the environment is initiated to ensure health, integrity, and performance throughout the implementation cycle, even before acceptance and release of the production environment. Our proposed GCS are designed to strictly support the health and availability of the Cloud hosted environment, separate and distinct from standard GIS support services, which can be covered under the staff augmentation model and associated hourly rates. All non-routine and ad hoc requests are considered outside of the scope of GCS, which are designed and proposed to support the Cloud environment as defined above. Changes to system design or architectural footprint will be considered as a change order with the corresponding impact on the budget.

The sections below outline the technical scope of the proposed Geospatial Cloud Services for the configured MSWD production environment.

- **Contract:** Fixed Price for a 12-month period of performance
 - Assumes no changes to the Cloud system architecture, including, but not limited to the addition of servers, instances, and specifications.
- **Business Support:** 8:00 am to 5:00 pm (local time), Monday through Friday.
 - Although 24/7/365 support was referenced within the RFP, Axim is proposing our standard support times for this initial scope. As adoption and utilization of the system expand or as critical systems are implemented, we can introduce extended support.
 - Axim offers extended support in collaboration with Esri India, to include after hours, weekends, and holidays.
 - A quote for extended support can be provided upon request.
- **System Uptime:** Anticipated to be 99% during business hours
 - Planned maintenance requiring downtime will be coordinated for after hours and communicated in advance
 - Unplanned system disruptions that occur after hours will be addressed starting the next business day
 - Response Time Objective: 2-hours to acknowledge an issue and assign staff to investigate.
 - Recovery Time Objective: 4-hours, however actual times may vary by root cause.
 - Offline access may be support per the dependent solutions, such as certain Esri mobile solutions and Cityworks Mobile. The extent to which offline access is current and accurate will depend on local workflows for synchronization of the specific solutions. The cloud configuration will not, independently, have offline access.
- **Geospatial Cloud Managed Services Includes:**
 - **Monthly System Checks:** Includes monthly system verification, “health grades,” and maintenance recommendations.
 - **Monthly System Maintenance:** The recommended maintenance will be executed monthly during the regularly scheduled maintenance window. The potential for system restarts and disruption during the maintenance window is expected and will be consider planned down time (excluded from uptime calculations). To minimize disruptions to day-to-day business operations, the Axim Cloud Managed Services team offers a regularly scheduled maintenance window on the third Wednesday of each month outside of local business hours (proposed maintenance window will be mutually agreed upon). Either party may request a change to the regularly scheduled maintenance window via email or phone communication.
 - **Email Support:** Axim will manage and monitor a client-specific email for MSWD (e.g., - MSWDSupport@aximgeo.com). The designated email address will be used to report issues related to the environment, such as availability, stability, or performance. For such issues, the targeted response, recognition, and resource assignment is two (2) business hours. Requests, inquiries, and standard communications should be directed to the appropriate Axim staff, as designated in the communications plan.
 - **Operating System Updates:** Checked and updated monthly.
 - **Esri ArcGIS Enterprise Patches and Security Patches:** Checked and updated monthly.

- **Back-ups:** Configured and verified monthly.
- **Track Expiries:** Axim Geospatial will track expiries and coordinate renewals for ESRI licenses, SSL certificates (for web tier servers), and Cylance Anti-Virus.
- **Cloud Provider Required Updates (Quarterly):** Axim Geospatial will apply Cloud Provider Required updates (AWS) on a quarterly basis.
- **Quarterly Client Syncs:** Axim Geospatial will schedule recurring quarterly client syncs with designated MSWD project leadership.

Approach Project Component 2: Import Existing Data and Ensure Readiness

Planning and Analysis

Axim will facilitate a project component kickoff meeting with the Axim and MSWD project teams to review the scope, establish the project schedule and communication plan, and initiate technical tasking. We will follow the phased project management approach outlined earlier throughout the project component tasking.

Design

To prepare for the ArcGIS Utility Network (UN) and Cityworks implementations, Axim must first convert MSWD's existing data into an Esri file geodatabase format and perform a readiness assessment. Existing source data is organized into water, wastewater, and landbase domains in a mix of Access personal geodatabase (PGDB, .mdb) and Esri shapefile (.SHP) formats. Axim will confirm the current source data poses no conversion issue and plans to configure FME workbenches to convert these sources into Esri file geodatabase (FGDB) format, consolidated with one FGDB for each domain. These FGDBs will serve as the basis for all UN activities described in the next project component.

Deliverables

- Source data review and confirmation: water, wastewater, landbase

Development

Axim will configure FME workbenches to convert the legacy PGDB and SHP formats into consolidated FGDBs for the respective water and wastewater sources. Axim will attempt to deconflict potentially duplicated records through spatial and attribute comparison, conflating the source datasets into a single authoritative dataset. For the PGDBs, Axim will replicate the current feature dataset, feature class, and subtype structures before processing the SHP sources.

Additionally, Axim will upload existing as-built PDFs to a file share location in the newly deployed Cloud environment. Where possible, we will update existing source links in the geographic features to the new PDF locations using relationship classes and URL fields within the FGDB. This approach will allow for the potential of a many-to-one relationship of PDFs to features.

Finally, Axim will configure a FME workbench to convert the landbase PGDB and SHP sources into a consolidated FGDB location.

Deliverables

- Configure FME workbenches to convert source PGDB and SHP to FGDB: water, wastewater
- Migrate as-built PDFs to Cloud
- Update geodatabase PDF links to new file locations
- Configure FME workbenches to convert source PGDB and SHP to FGDB: landbase

Testing

Throughout this project component, Axim will perform quality control to validate that all source records and data have been loaded and reviewed as needed. Axim will implement a mix of semi-automated tools, scripts, and manual spot checks to ensure the data quality and integrity are maintained during the conversion. Axim is including up to 8 hours to make fixes to the source data to enable loading into the file geodatabase format or to perform past load repairs to ensure data integrity and retention of all information. Any additional time needed for repairs can be performed under the Staff Augmentation component of this proposal.

Deliverables

- Quality control testing of data conversion

Implementation

As part of the final implementation phase, Axim will load the three converted FGDBs to the Cloud and make them available to MSWD staff. We will then upload the referenced MXDs and convert them into Pro projects using the newly converted FGDBs as the data source.

Assessments

Axim will evaluate the District's water and wastewater datasets, now converted into file geodatabase (FGDB) format, using ArcGIS Data Reviewer and a Requirements Discovery meeting for our team to understand current data conditions better. We will prepare a Data Assessment Report summarizing and prioritizing errors in the source data that need to be addressed, along with a file geodatabase of all error locations. We will also evaluate the current business systems to understand GIS data dependencies and integration patterns. These assessments together will result in an MSWD-specific Implementation Plan.

The Data Assessment provides a list of prioritized data cleanup recommendations. These will be left for MSWD staff to complete. However, Axim can optionally perform updates through the Staff Augmentation component of this proposal at the request and direction of MSWD.

Deliverables

- Initial data review
- Requirements Discovery meetings: water, wastewater
- Data Assessment (Error report, recommendations, and error geodatabase): water, wastewater
- Implementation Plan
- Optional Data Cleanup through Staff Augmentation component

Approach Project Component 3: Migrate Data into Esri Utility Network

Planning and Analysis

As described earlier, Planning and Analysis begins with a kickoff meeting and continues through final acceptance of the project component. Axim will facilitate a project component kickoff meeting with the Axim and MSWD project teams to review the scope, establish the project schedule and communication plan, and initiate technical tasking. Throughout the duration of the UN implementation, the Axim PM will meet with the District's project management bi-weekly to review tasking, upcoming milestones, or potential risks to the project schedule. We will follow the phased project management approach outlined earlier throughout the project component tasking. Project Component 3 can begin once the District has accepted the converted water and wastewater file geodatabases.

Design

Data Modelling

Axim will facilitate a 2-day (up to 16 hours) remote Data Modelling and Design Workshop to complete data mapping worksheets for converting the water and wastewater source data into the UN data schema. MSWD is not presently using Esri geodatabase structures and has indicated its expectation to adopt Esri's existing UN base models for each domain as-is without needing extensions. To this end, Axim and MSWD will map all existing District data into this model, which may necessitate the District adopting alternative terminology for current assets. Axim will first prepare initial spreadsheets to be finalized during the workshop. Axim will also review external data requirements that might be required for dependent business systems. MSWD has about twice the usual number of layers for water utilities. Only active layers will be converted into the UN. Abandoned features will be converted and stored in a separate geodatabase similar to the landuse layers. Should the modelling workshops reveal a requirement to extend Esri's base models to support external business systems, Axim and MSWD will determine appropriate adjustments to the project scope. Once the database design is approved, the Cityworks AMS planning processes in Project Component 4 may begin in parallel.

As MSWD plans to use Esri's unaltered base models, Axim will reference Esri's online base design documentation and data dictionary rather than create separate design documentation, as would be necessary when extending the model.

Deliverables

- Data Mapping Crosswalk spreadsheets: water, wastewater
- Data Modelling and Design Workshops: water, wastewater

Development

Data Conversion

After completing the design, Axim will build the respective UNs in file geodatabase (FGDB) format. We will localize Esri's base model for each system to the correct coordinate system and configure the FME/Data Interoperability extract, transform, and load (ETL) tool to convert and load the previously converted spatial data into the FGDB UN. We will review the configuration with MSWD to confirm the ETL configuration matches the data mapping and make any necessary revisions before performing pilot implementations.

Pilot Implementation

Axim will configure a QAQC workbench to validate the data conversion results. We will then run the ETL tools in an FGDB for each system, converting all source data into the destination, and perform our first UN build. This will produce a build error report of additional source data conditions that must be addressed before full implementation. Axim will clean converted data within a small test area (e.g., a single pressure plane) limited to testing associations, subnetworks, and network trace results. Finally, we will prepare Esri's ArcGIS Pro project templates for the MSWD review of the UN.

Knowledge Transfer

Axim will prepare Best Practices Documentation outlining FGDB editing workflows and UN functionality. We will facilitate up to 12 hours of remote knowledge transfer sessions for GIS editors to acquaint them with the MSWD UN implementation. Our knowledge transfer is intended to build upon rather than replace Esri's ArcGIS Pro and ArcGIS Utility Network offerings.

Client Review

Axim will prepare a test plan outlining the tasks MSWD staff will need to test to validate the data design,

conversion, and UN functionality. MSWD will have five days (or as agreed upon) to test and provide feedback to Axim. We will track all feedback in our Jira system and make any approved revisions. After making any approved revisions, Axim will deliver an updated FGDB for MSWD review and approve before enterprise deployment in the Cloud environment.

Enterprise Deployment

Axim will prepare a Deployment Plan to guide the publishing of the UN to the MSWD enterprise environment. Working within the Cloud environment, Axim will prepare the converted database, configure Portal test users, and perform the necessary tasks to publish the UN in the MSWD enterprise environment. These tasks include enabling the UN, localizing ArcGIS Pro templates, publishing services, and setting branch versioning. Axim expects to publish up to 3 services for each utility domain – editing, simple features (read-only), and Cityworks support (based on the editing service). We will also provide up to 4 hours of additional knowledge transfer to power users on enterprise-specific workflows and 12 hours to administrative users, including Administrative Documentation on managing the system.

Deliverables

- Localize FGDB UN base model: water, wastewater
- Configure FME/Data Interoperability conversion tool: water, wastewater
- QAQC workbench: water, wastewater
- Complete FGDB Pilot data conversion with a cleaned test area: water, wastewater
- Build Error Report: water, wastewater
- Pilot FGDB UN configuration testing (complete source migration, cleaned test area, subnetwork configuration, named trace configuration): water, wastewater
- ArcGIS Pro project template updates: water, wastewater
- Editing Best Practices Documentation: water, wastewater
- Remote knowledge transfer sessions for core GIS staff/editors (up to 12 hours)
- Test Plan
- City review, feedback, and revisions (database, ETL, and UN configuration)
- Written City approval of Database Design, data migration, and UN configuration: water, wastewater
- Deployment Plan documentation
- ArcGIS Enterprise preparation (Portal users, versioning, Pro templates, map services): water, wastewater
- Updated Best Practices Workflow Documentation: water, wastewater
- Administrative Documentation: water, wastewater
- Remote knowledge transfer for editors and administrators

Testing

Once the UN is deployed to the enterprise environment, Axim will provide an updated test plan and facilitate user acceptance testing, beginning with a client testing handoff meeting. MSWD should expect five days to thoroughly test the UN functionality within the enterprise environment and provide feedback. Advanced functionality, including tracing, is expected to function only within the designated pilot area fully. We will support testing with ad hoc conference calls when needed, track all feedback in our Jira issue tracking system, and determine appropriate action. Axim will make necessary environmental adjustments.

Deliverables

- Test Plan document

- Client testing
- Testing support (calls, Jira)
- Environment adjustments (ArcGIS Enterprise, ArcGIS Portal users/groups, services)

Implementation

Once testing is complete for each system, Axim will coordinate with MSWD to declare an editing freeze on the current production database. We will then perform a final complete conversion of all source data, including QAQC, and deploy it to the new MSWD enterprise production database in the Cloud. We will finalize enabling the UN, versioning, and configuring map services. Immediately after deployment, we will provide a two-day onsite Go-Live support trip to aid MSWD's transition to the production water and wastewater UNs. Axim will track any production issues in Jira and resolve them as appropriate. After Go-Live, we will deliver updated and finalized Best Practices and Administrative documentation.

Deliverables

- Prepare ArcGIS Utility Network in production enterprise environment
- Final complete database migration into ArcGIS Utility Network
- Production database deployment
- Onsite Go-Live support for release of ArcGIS Utility Network
- Production issue tracking and resolution
- Final Best Practices and Administrative documentation

Approach Project Component 4: Cityworks Implementation

Planning and Analysis

Similar to the approach described in previous project components, the Planning & Analysis phase begins with the kickoff of the Cityworks tasking and continues through final acceptance. Axim will initiate a kickoff meeting to introduce respective team members, establish a communication plan for coordinating activities, review the scope, and establish the timing and frequency of recurring meetings with MSWD project management. Axim will then build a detailed project schedule before initiating work with input from participating MSWD staff regarding availability, capacity, and conflicts. Throughout the Cityworks implementation, the Axim PM will meet with the District's project management bi-weekly to review tasking, upcoming milestones, or potential risks to the project schedule.

Design

Configuration Requirements Gathering & Documentation

The initial configuration requirements gathering workshop will be a four (4) day onsite effort facilitated by Axim staff. Through conversations, interviews, and brainstorming sessions, we will help identify or consolidate each participating department's maintenance practices, core work activities, data entry and reporting needs to support the development of Cityworks AMS and its supporting applications. The District has already provided a detailed description of functionalities and business processes currently provided to users by existing systems, and this crucial step will allow both MSWD and Axim to translate the stated requirements into a Cityworks implementation that is custom-fit to each participating department. The workshop will be organized into sessions with MSWD staff participation (typically limited to 3-5 people). Before the onsite work, Axim will collaborate with MSWD to develop an agenda. MSWD will coordinate the necessary facilities and participant schedules to ensure key stakeholders are present.

The information compiled during the working sessions will be documented by Axim staff and provided to MSWD for review, finalization, and official approval before initiating system configuration. Axim will provide MSWD with formatted spreadsheets to populate with organizational information to facilitate

translation into the Cityworks configuration. These workshops' document(s) will guide the subsequent configuration stages.

Deliverables

- Onsite Discovery Workshop (4 days)
- Configuration Plan

Development

Host Environment Preparation

Axim proposes implementing Cityworks Online (CWOL) as a Software-as-a-Service (SaaS) platform to host the enterprise asset management system for MSWD. CWOL is a multi-tenant deployment within an Amazon Web Services (AWS) environment, fully managed by Cityworks (including the hosting environment, application updates, and database backups), and offering the same core application functionality as an on-premises deployed Cityworks solution.

Axim will coordinate with Cityworks to establish the foundational host framework and instance to support the Cityworks implementation. We will use the information gathered during the Discovery workshops to make recommendations to ensure support and consistency with the CWOL environment. As proposed, the CWOL environment will provide a two-tier deployment pattern comprised of sandbox and production tiers. Each environmental tier will have a corresponding database replica to support external reporting and integration.

GIS

Cityworks leverages the Esri enterprise GIS geodatabase, achieved by dynamically consuming GIS services (map, geocode, etc.) delivered through ArcGIS Enterprise, either directly or through Portal or ArcGIS Online. Axim will help MSWD identify the required data needs and provide guidance on the structure and content of those services, including access to supporting PDF documents or other supported file types. Axim will leverage the feature services published from the migrated network assets from the UN feature service design and associated relationships, however MSWD staff will be responsible for designing the specific cartographic presentation and behavior of the maps and publishing any other services themselves. Alternatively, Axim can optionally assist in publishing the GIS services for consumption by Cityworks through the Staff Augmentation component of this proposal at the request and direction of MSWD.

Cityworks supports a Single Sign-on (SSO) approach to facilitate simultaneous authorized access to not only the Cityworks application but also the data services and web maps containing the asset repositories within the enterprise GIS. Single Sign-on also enables additional map tools and app switching between the Cityworks Mobile Native apps and Esri apps such as Field Maps and Navigator. Axim recommends that MSWD deploys SSO to align their Cityworks user accounts with those in ArcGIS Portal to seamlessly pass credentials to authorized content within each application without needing resource proxies. This approach, however, requires all Cityworks users to have an ArcGIS Enterprise (Portal) account, which is then configured as a username in Cityworks. Axim will work with the District to properly deploy SSO authentication between the two platforms, if required or desired.

Note: if using Cityworks' Mobile Native Apps for either iOS or Android with GIS services that are secured (requiring username and password to access), SSO is required for map functionality within the mobile app.

Cityworks Core Configuration

Among the first core configuration activities will be loading the organizational information that will serve as a baseline for implementation into the Cityworks Respond application. This will include employee

information, equipment, materials, contractors, and project information. Axim will also set up user accounts (up to 50 users) and associated functional/operational groups with permissions to control access to appropriate content and workflows within Cityworks.

For the core work activity configuration, we will leverage the documentation and information gathered in the onsite workshops and finalized during the Design phase to drive functional configuration. Given the granularity of the configuration, we will also work with MSWD staff throughout the implementation to ensure we have understood and are accurately reflecting processes within Cityworks. We have assumed up to 100 service requests, 300 work orders, and 10 inspection templates to accommodate the scope as described in Exhibit G. Although we recognize that MSWD is estimating 217 service request templates, Axim is proposing 100 based on our experience with other clients who have used the Cityworks implementation as an opportunity to clean up, aggregate, or streamline various aspects of legacy systems and workflows. Furthermore, the proposed service request templates described by the District share many characteristics that are commonly addressed as work orders in Cityworks, and therefore we are accounting for 300 work order templates as opposed to the 265 estimated by MSWD.

With that said, these assumed number of work activities are not intended to be a strict limitation or organizational constraint but rather the foundation for estimation and proposal. Within any project of this magnitude, the team will collectively identify processes, workflows, or general information that may influence the direction of development processes and communicate with MSWD project management if there are significant deviations from the abovementioned quantities.

Reporting & Dashboard Configuration

A core function within Cityworks AMS is the ability to perform flexible and powerful ad-hoc searches (or queries) and develop reports containing work and asset management information that can be reviewed, visualized, exported, or shared. These queries can also be saved and translated into Cityworks dashboards, offering a convenient, dynamic glimpse into long-term or real-time system activity. The content and format of shared dashboards will be based on the functional requirements described in the RFP with input from District staff.

In our experience implementing Cityworks, we have discovered that the robust capabilities of native Cityworks dashboards will often replace the need for a more formal, form-based legacy report template. In cases where a more formal and print-friendly report template is necessary, Axim will leverage the embedded reporting engine, Active Reports, to develop and format report templates based on existing templates provided to Axim by MSWD. Predefined report files (*.rdlx) will be developed in the native Active Reports interface leveraging the Cityworks data model diagrams, formatted as desired, and then loaded through the Cityworks web interface. Additionally, Cityworks hosts a library of reports developed by users and communities nationwide that MSWD can access to review and optionally deploy.

The content and formatting of any dashboards or custom reports will be based on input from MSWD staff. They may represent reports already existing within the business process or new reports not feasible within the previous system. Axim got a sense of the reporting requirements based on the existing functionality described in Exhibit G. However, given the breadth and the high variability in complexity for any given report or dashboard, we are proposing an explicit block of hours (up to 64 hours) rather than a designated number of reports or dashboards. Axim will coordinate with MSWD to identify and prioritize these reporting functions and continuously communicate progress as these outputs are developed. Axim will also cover end-user creation of custom queries and dashboards and generating Active Report templates during training, empowering users to leverage dashboards or reporting further for individual needs. To supplement these efforts, Axim can optionally assist in further dashboard or report development through

a separate and supplemental support contract.

Materials & Inventory Management

As described in Exhibit A, MSWD will rely on Cityworks to provide inventory management concerning performed maintenance, as well as the ability to manage purchase orders, vendors, and transaction data. With the Cityworks Storeroom module, users can track transactions of materials with additional functions like security, costing options, vendor and material information, and material transaction reporting. Storeroom is a product designed to track incoming and outgoing materials from multiple storage areas, as well as manage stock, material cost, suppliers, and requisitions. Axim proposes deploying up to four (4) storerooms, or functional warehouses, within the Storeroom module. These storerooms can be fixed storage locations such as buildings and warehouses or even mobile service vehicles. Each storeroom will contain warehouse-specific materials, which may be department-specific, but they can be mixed.

During the discovery workshop, Axim will discuss the organizational strategy of the storeroom allocations and effective management of material transactions and guide configuration best practices. Additionally, Axim will configure the necessary dashboards within the Storeroom app to support the core Storeroom transactions and associated workflows. Further guidance on configuring individualized Storeroom dashboards and report templates will be provided during end-user training before the configured Cityworks site is released to production. To support the Storeroom implementation, the District will provide Axim with a list of materials and associated vendors in a Storeroom-based format (provided by Axim), with each material type associated with one or more storerooms.

Mobile Configuration

Cityworks is designed with multiple interfaces to provide end-users with a tailored experience, whether in the office or the field. Cityworks Respond enables mobile work activities via a browser-based interface optimized for tablets and other mobile devices. At the same time, Cityworks Mobile is a native app (iOS and Android) designed to support the completion of field activities (e.g., Service Requests, Work Orders, and Inspections). While Respond requires a constant network connection, the Mobile app is downloaded via the compatible app store. It can be used without an internet connection and synchronized once connectivity is restored. Axim will work with MSWD staff to determine which platform is the best fit for mobile use by MSWD field staff and provide guidance on configuration best practices during the discovery workshops. Finally, Axim will work with the District to configure the mobile platform for access on the devices procured by the District.

Enterprise System Integrations

The District has expressed a desire to integrate with several enterprise systems long-term, with an immediate need to integrate with t4 Spatial and DigAlert. While integration with GIS is inherent and part of all implementations, Cityworks also offers a rich and mature suite of application programming interfaces (APIs) that allow the platform to integrate with virtually all third-party systems. The Cityworks APIs offer comprehensive functionality that compliment an equally open, nicely structured, and well-documented database schema supplemented by robust documentation. Axim has a reputation founded on the strength of our ability to develop custom solutions and integrations, and our team of developers maintains deep familiarity with industry best practices for both process and architecture.

The Axim approach to designing and developing integrations is both collaborative and synergistic. Similar to our requirements gathering process described earlier, Axim will facilitate a remotely held Discovery Workshop of up to eight (8) hours over multiple sessions to gather the functional requirements necessary with each integration. We will coordinate with MSWD for access to and engagement with the respective developers and vendors, whether local staff or a commercial entity. In doing so, we can frequently validate

and optimize our technical vision to guide stable, long-lived integrations. We assume that the District has or will procure (separate from this proposal) any licensing associated with t4 Spatial and DigAlert and that the APIs will accommodate the desired functionality for the integrations.

Axim understands that MSWD is seeking the ability for users to view CCTV video inspections and related inspection data stored in t4 Spatial directly from Cityworks. With the understanding the MSWD has a long-term goal to integrate with Cues GraniteNet not included in the current scope of work, Axim is proposing a custom one-way integration with t4 Spatial to provide Cityworks users access to CCTV video inspections and available inspection data hosted in t4 Spatial related to the asset in GIS or associated work activities. Based on the information provided in the RFP and Q&A, Axim envisions the stored inspection videos to be available as a hyperlink embedded within the Cityworks interface, as well as included as an attribute of the GIS feature, and therefore readily available either in Cityworks or any other Esri-based application that consumes the targeted feature class.

Similarly, MSWD intends for integration of Cityworks with DigAlert for receiving, responding to, and closing tickets, a need that aligns with the strengths of the Cityworks platform and the available APIs. The envisioned workflow is such that request submissions are entered into DigAlert and will automatically flow into Cityworks as a Service Request using the DigAlert API. MSWD staff will have the ability to view ticket information within the request and take the appropriate actions, logging activity and results against the Service Request, which upon completion will be returned to DigAlert with corresponding data changes. The integration can then notify the person who submitted the request that the ticket has been closed. The workflow defined dictates a bi-directional integration between Cityworks and DigAlert. Axim is proposing to leverage the respective APIs to achieve the desired functionality and we will collaborate with technical staff supporting the DigAlert application to design and verify the optimal approach. The exact technical specification and methods employed for the integration will be determined following the integration workshop described earlier.

In conjunction with the third-party inputs, Axim will develop concise summary documentation to provide the business and functional context that underlies our design recommendations. Axim will then review the designs with appropriate MSWD project management and stakeholders. Axim will develop, deploy, and/or configure the proposed integrations either in the Axim environment or in a lower tier environment during the Development Phase to establish the broader system capability as the project heads into the testing and acceptance phase. Note that Axim will rely on the availability of third-party environments provided by MSWD or the software vendor to accommodate testing without impact to production users.

Following acceptance, Axim will finalize documentation with a focus on the deployment pattern and administrative requirements. We will also deploy the integration to the production tier and update any configuration (as necessary) to ready the system for release.

Data Migration

Within the SOW described in Exhibit A and Q&A responses, the District indicates the desire to migrate legacy data from Nobel Geoviewer and Eptura ManagerPlus into Cityworks. Legacy data can be a powerful asset to organizations. At the same time, some legacy data may lack integrity or quality controls, which could effectively translate into operational noise in the newly implemented system. To accommodate this, Axim is proposing to leverage another Discovery Workshop with the District; this time, it will focus on collaboratively exploring the legacy data of interest and evaluating the value of migration into Cityworks together. The proposed workshop will be facilitated remotely, with multiple sessions totaling up to eight (8) hours.

The data migration effort will be performed similarly to the earlier ETL processes. Axim first obtains access to the source data repository to facilitate a schema crosswalk, in which we identify and map the tables, fields, and values involved in the migration. We will review the crosswalk with MSWD staff for feedback and approval, after which the team will begin developing the ETL automation processes using the most effective platform for the task (e.g., FME, SQL, Python). The migration scripts will be executed against the source data to accommodate MSWD review, feedback, and approval through an iterative cycle. With acceptance and as part of the final implementation process (a late-stage task within the project), Axim will perform the data migration into the production environment. It should be noted that certain datapoints intended for migration denoted in the Q&A responses (e.g. employee labor rates, inventory items, equipment rates) may already be incorporated in the Cityworks implementation as part of the core configuration activities.

Our approach to estimating the effort involved with legacy data migration is not based on the number of existing records, but rather on the number of legacy database tables (and associated fields) for translation into the Cityworks database schema. Based on our review of legacy data information provided in Addendum 2, we are proposing a data migration of up to twenty three (23) source tables from Geoviewer and ManagerPlus to Cityworks. This estimate is informed by prior experience with our portfolio of clients and guided by a repeatable process established by the countless data migrations Axim has performed.

Additionally, the proposed approach allows and requires the District to provide exported and flattened data from Geoviewer and ManagerPlus in a format with standard data structure (e.g., clearly identifiable tables, intuitive/readable field names, with content filtered as desired). Anomalies, deviations, or quality issues that interfere with a scripted migration will require attention and resolution by District staff.

Deliverables:

- Cityworks software configuration
- Work Activity template setup
- 100 Service Requests
- 300 Work Orders
- 10 Inspections
- Custom Report & Dashboard Development (up to 64 hours)
- Storeroom – Inventory, Vendor, & PO Management
- Mobile App configuration
- Data Migration Workshop (8 hours)
- Data Migration from Nobel Geoviewer to Cityworks
- Enterprise System Integration Workshop (8 hours)
- Integration with t4 Spatial and DigAlert

Testing

Axim introduces our first training opportunity during the testing phase, in preliminary training. The preliminary training structure is proposed as three (3) days of onsite training sessions, targeting a subset of power users from each department participating in the testing and acceptance process. The format is designed to provide an orientation of the system at the end-user level (administrative training will occur during the final training) with the intent of providing enough familiarity to facilitate testers comfortably evaluating the configured workflows against those that were described to Axim in the requirements documentation stage and subsequently approved by MSWD.

The testing process is designed to span twenty (20) business days following the last day of the preliminary

training sessions. In turn, Axim will refine the configuration, as appropriate, to match the accepted requirements based on the feedback received. Axim will accept one consolidated set of feedback per week of testing (for four total submissions). The team will review, qualify, and address each item accordingly. Axim assumes that MSWD will allocate sufficient resources to adequately test the application and provide feedback for each phase of release. Any input traced back to the system or software design can be submitted to Cityworks for inclusion in their list of defects pending resolution or consideration in future development cycles.

Deliverables

- Preliminary Training (3 days, onsite)
- Testing Support
- Feedback Tracking
- Iterative Configuration Adjustments
- Final Configuration

Implementation

Production Release & Go-Live

Following acceptance of the Cityworks configuration performed within the lower-tier testing application, the next step is configuring the production environment in preparation for the release of the production system. Axim strongly recommends that MSWD release the system to users immediately following their final training event(s) to ensure the information and experience they gleaned is fresh and will translate effectively into operational utilization. Axim will work with Cityworks to replicate and ready the application and site configuration for the initial production release. All data entered as part of testing will be purged to create a clean system.

The final steps of the production implementation should require minimal system downtime, primarily the time necessary to run final legacy data migration scripts and update integration configuration to point to production systems. Axim will work with the District to identify a window of time for the final implementation that will minimize disruption to end-users.

End-user & Admin Training

Effective training is crucial in successfully adopting any enterprise system, and Cityworks is no exception. We are proposing a train-the-trainer method that has proven effective for several reasons, including establishing a deeper understanding of institutional knowledge and the ability to articulate system functionality and capabilities with greater context. A train-the-trainer approach is comprised of sessions that include five (5) to ten (10) core staff per business unit, creating a more contained and interactive environment conducive to deeper immersion and at a pace catered to the attendees. While the specific curriculum is yet to be defined, the generalized content of the final training event will ultimately cover the primary thematic areas listed below:

- **End-user Training (4 days onsite)**
 - Creation of service requests, work orders, inspections, etc. through both web and Mobile applications; map interaction; dashboard and query management; and more.
- **Administrative Training (1 day onsite)**
 - Review the deployment process and structural components and requirements of the application, administration of the application and associated ArcGIS Enterprise services, configuration of service requests, work orders, inspections, etc., database schema review, ActiveReports, maintenance processes, and more.

The reference material associated with the training sessions is intentionally centered on the existing Cityworks Help documentation. Still, it will be delivered through hands-on experience, creating additional value as users can refer back to the materials readily available directly through the application.

Deliverables:

- Testing data purged from the Cityworks database
- Final Legacy Data Migration
- Integrations migrated to Production Endpoints
- Completed Production tier Application
- Final Curriculum and Training Agenda
- End-User and Administrative Training (5 days, Onsite)

Approach Project Component 5: Staff Augmentation

Perhaps the greatest strength of Axim, and the foundation of our reputation in the industry, is the depth and breadth of our team. Axim team members are known for our unmatched, personalized level of service nationwide and have served local government agencies in all 50 states. We take an adaptive approach and understand the importance of your objectives. Our unique position in the market, based on our company size and singular focus on location technology, means that we have the technical resources to address any GIS challenge. Our experience across Federal, State, and local governments has allowed the team to add domain experience to complement the technical expertise. For MSWD, this translates into stability and capability that is not always feasible through hiring a single person at the District. Our experience has shaped a proven and repeatable pattern of support for providing a single individual or a core team that centers on the assignment of a Project Manager (PM) to provide overarching project leadership, management (scope, budget, schedule, etc.), quality control, and technical direction. This core team will provide the requisite technical leadership and oversight to ensure proper adherence to best practices as well as quality of delivery. As appropriate, the team will leverage the broader pool of Axim Solutions Engineers and Geospatial Analysts. In each case, we will assign the most appropriate staff concerning thematic alignment and experience to ensure value to MSWD. Axim's Project Manager will identify the support tasks and establish a communication plan for coordinating the activities of the task as well as status reporting. Milestones and completion dates will be established for the Planning and Analysis, Design, Development, Testing and Installation/Implementation and Client Review phases of a large task or project within the staff augmentation. Axim has adequate capacity and technical expertise to accommodate anticipated project work for MSWD. Axim performs extensive resource planning monthly, quarterly, and annually to analyze capacity and skillsets required to ensure client commitments are met. We have procedures, tools, and metrics in place for resource planning. Staff augmentation offered by Axim brings together a diverse set of skills, experiences, structured planning, and technical expertise necessary for effective GIS management and successful project execution. Axim's staff augmentation provides stability, depth and comprehensive support to support MSWD's GIS management and initiatives

CONSULTANT INFORMATION

Company Information

Axim's mission is to use our geospatial expertise to provide clarity and solutions to help our customers solve the world's national security, infrastructure, and environmental problems. We are the largest singular provider of end-to-end geospatial services and solutions in the U.S serving the communities in which we live.

Axim's core competencies include: big data services, geomatics, business solutions, Cloud services,

infrastructure security, analytics and professional services. Customers include national, state, and local government, defense and intelligence, infrastructure, utilities, energy, commercial and environmental customers.

Axim was launched in January of 2022 as a rebranding effort of parent company Continental Mapping Consultants, LLC and its two subsidiaries; GISinc and TSG Solutions, inc. Although a new entity by name, Axim brings over 31 years of corporate experience given that the previous companies were founded in 1991, 1999 and 2001 respectively. Axim has access to over 1300 US-based staff and has completed over 10,000 geospatial projects including mapping projects on all seven continents and in over 180 countries.

In February 2023, we announced NV5 Global, Inc’s acquisition of Axim as a wholly owned subsidiary. This acquisition pairs Axim’s intimate knowledge of Esri ArcGIS technology and Cityworks operations and planning with a team of geospatial and engineering professionals. NV5, headquartered in Hollywood, Florida, has over 85 California offices throughout the U.S., 23 of which are located within the State of California, and 9 additional offices in Asia. While we are submitting this response as Axim, we are now supported internally by over 4,500 A/E and geospatial professionals in North America and Asia and have office locations within close proximity to MSWD. The result is a world-class firm ready to provide a unique and robust offering across engineering, design, architecture, geospatial, survey, computer programming, and other related disciplines.

Axim has provided the following additional information as required by the RFP:

Consultant Name: Axim Geospatial, LLC		Consultant Contact Person for all Offices: Theron Hodel, Account Manager	
Organization Type: Corporation		Theron.hodel@aximgeo.com 205.725.5803	
Headquarters and Branch Office(s) Information:			
<u>Headquarters – Sun Prairie, WI</u>	<u>Branch Office – St. Louis, MO</u>	<u>Branch Office – Birmingham, AL</u>	<u>Branch Office – Carlsbad, CA</u>
100 QBE Way Suite 1225 Sun Prairie, WI 53590 877.294.6434 info@aximgeo.com	727 N 1 st St Suite 410 St. Louis, MO 63102 877.294.6434 info@aximgeo.com	2100 Riverchase Center Suite 105 Birmingham, AL 35244 877.294.6434 info@aximgeo.com	2701 Loker Ave W #230 Carlsbad, CA 92010 877.294.6434 info@aximgeo.com

Litigation Statements

In the past five (5) years, Axim has not been involved in any litigation, mediation, or arbitration, regarding the performance of any services similar to the services. The services do not require a license or certification, and Axim has not had any claims or disciplinary action taken against the firm or any key personnel within the past five years. Axim has not filed bankruptcy over the past five (5) years.

Consultant/Vendor Requirements

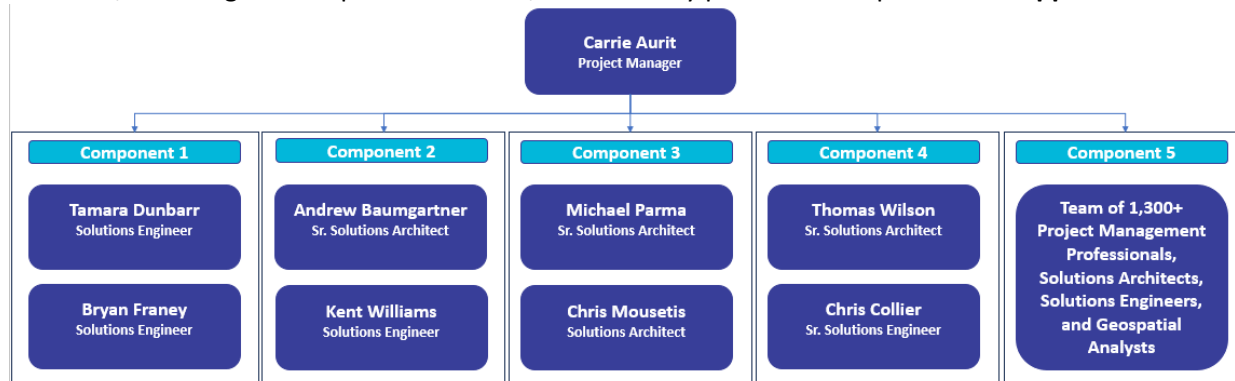
As evidenced throughout this response, Axim has met the following requirements of this RFP:

1. Axim is an Esri Platinum Partner
2. Axim holds an Esri ArcGIS Utility Network Certification
3. Axim is a partner of and maintain staff with certifications in AWS (the cloud service provider being proposed) including Certified Cloud Practitioner.
4. Axim has provided references in this response as well as in the required questionnaire to showcase experience in performing this service for comparable agencies to MSWD.
5. Axim meets the insurance requirements outlined in Section D and E of Exhibit F, the sample

- Professional Services Contract.
6. Axim has a minimum of three (3) most recent years of experience performing similar services as those detailed in the scope of work (Exhibit A) of this RFP.
 7. Axim has completed Consultant Questionnaire (Exhibit D).
 8. Axim has completed the Disclosure Questionnaire (Exhibit E).

CONSULTANT PERSONNEL

Axim has assigned the following key personnel detailed in the organizational chart below to this contract. Resumes, including contact phone numbers, for these key personnel are provided in **Appendix A**.



QUALIFICATIONS, EXPERIENCE, AND REFERENCES

As previously stated, Axim was launched in January of 2022 as a rebranding effort of parent company Continental Mapping Consultants, LLC and its two subsidiaries; GISinc and TSG Solutions, inc. Although a new entity by name, Axim brings over 31 years of corporate experience given that the previous companies were founded in 1991, 1999 and 2001 respectively. Under these legally registered business names, Axim has far more than 3 years of experience, within the past 5 years, providing services of a similar type and scope as described in the Scope of Work. Axim has not filed for bankruptcy under any of these business names over the past 5 years. Axim has completed a response to all **Exhibit D** items and uploaded the file with the response submission.

Axim has been leading the way on enterprise implementations centered on location technology. Along the way, we have been fortunate to see our efforts yield a success rate that vastly exceeds industry averages and as a result, have earned a reputation that has persisted even while the technology has changed dramatically. Our legacy strength was founded on a core development capability that remains central to our services today, but we have since broadened our focus to include diverse services that span every facet of a GIS program lifecycle. Our experience and partnerships that set us apart in industry are described below:

Industry Partnerships

Esri Platinum Partnership

Axim is one of only 17 Esri Platinum Partner firms. Less than 1% of Esri partners worldwide have achieved this highest tier of distinction. We have been an Esri Business Partner for 31 years and a Platinum partner since 2010 when Esri first came out with the designation. In addition, Axim has achieved Esri specialty status for several solutions and Esri product areas:





ArcGIS System Ready Specialty

ArcGIS System Ready. Awarded to partners that adopt the latest Esri technology, migrate offerings in a repeatable practice, and have a well-trained staff to support the latest Esri software releases.



ArcGIS Cloud Services Specialty

ArcGIS Cloud Services. With the maturity of business systems comes a need for flexible and agile Cloud environments and hybrid environments for business continuity and resiliency.



ArcGIS Hub Specialty

ArcGIS HUB. A community engagement platform that organizes people, data, and tools through information driven initiatives.



Indoor GIS Specialty

ArcGIS Indoors. An indoor mapping system connecting workspaces with employees and visitors.



Network Management Specialty

ArcGIS Network Management Specialty. GIS based network management for utilities, provides more functionality, added flexibility and advanced access to data. Axim is the first Esri partner to receive the Network Management Specialty designation for water utilities.



State and Local Government Specialty

Esri State and Local Government Specialty. This specialty is awarded to partners that specialize in, and have a substantial track record of success with, development and configuration of ready-to-use solutions for local and state government clients.

Our Esri Platinum Partnership provides significant benefits for our clients, including enhanced professional services and industry knowledge. Axim participates in both the Esri Partner Advisory Committee (PAC) and Esri Chief Technology Officer (CTO) Council, allowing us unparalleled representation for our clients and an opportunity to influence the trajectory of the various technology stacks. And, through this partnership, we gain access to early insights that allow Axim to position our clients for advances that may not yet be formally released.

Cityworks Platinum Partnership

Axim is a Cityworks Platinum Partner, providing a GIS-centric approach to enterprise asset management implementations. Axim has been working with Cityworks since before the first release of Cityworks Server – which represents the contemporary version of the software and the platform against which Cityworks has directed the bulk of recent development efforts. Axim has been an official Cityworks Implementation Business Partner since February 1, 2013, however, our experience providing Cityworks related implementation services dates back to 2008. And, in July 2017, just four years after establishing our partnership with Cityworks, Axim reached the highest tier available, becoming the **only firm to hold a Platinum status with both Cityworks and Esri.**

AWS Select Tier Partner

Axim is an Amazon AWS Select Partner, we have a dedicated team skilled in architecting, migrating, securing, and deploying ArcGIS Enterprise in the AWS Cloud. Our experience includes successfully completing over a hundred ArcGIS Enterprise deployments across AWS and other cloud platform providers. We have handled a variety of projects, ranging from simple single-tier environments to complex, multi-tiered, multi-zone deployments, integrating native cloud services and solutions alongside ArcGIS Enterprise.



Safe Software Partner

Axim is also a Safe Software business partner. FME (by Safe Software) is the premier integration platform for both Esri and Cityworks. Using our technical expertise in FME products and as a certified FME consultant, we help our clients translate and transform data between systems to streamline workflows and system integrations. Safe Software offers industry-leading tools that read and write data in hundreds of spatial and tabular formats, including GIS, raster, database, 3D, XML, LiDAR, and others. The FME platform enables the automation of data routines, giving you time to focus on your mission.



VertiGIS Partnership

Axim has a long-standing relationship with VertiGIS and a long history of working with their VertiGIS Networks product. Axim is the only implementation partner for VertiGIS and VertiGIS Networks is the only suite of products that offer web and/or mobile editing of UN data today.

Our most recent deployment of VertiGIS was for a company called Conflict Armament Research who focuses on the tracking and tracing of weapons supplies in active armed conflicts and mapping weapon flows. VertiGIS underlies their global weapon reporting and visualization system.

Client Partnerships & Experience

In addition to the industry partnerships introduced above, Axim also seeks to establish partnerships with our clients. Partnering with clients is a philosophy that is distinguished from the traditional contract and project-based perspective, by introducing dynamic and bi-directional engagement. We aspire to establish long-lasting partnerships that bring value and synergy to both client and Axim alike. In doing so, we have seen enhanced operational efficiency, increased communication and interaction, and robust client experience. In the end, the client experience is central among distinguishing characteristics. A truly positive experience is shaped by the combination of collective interactions between project teams and the quality of technical delivery. By creating true partnerships and focusing on the experience, Axim helps support and drive successful enterprise programs, from deployment to adoption.

Cityworks Experience

In the Partnerships section above, we outline our journey to becoming a Platinum Implementation Partner with Cityworks. That journey is founded upon our technical experience and expertise with the full range of the software platform. The Axim Cityworks implementation team offers a unique profile to our clients. Not only is each team member a proficient technologist, but all of them come from local governments where they were Cityworks users and administrators. This background results in a perspective that is empathetic to client and user requirements, understanding of workflows, and supported by deep technical knowledge.

In the decade since we became a Cityworks Partner, Axim has supported nearly 70 clients across the country with Cityworks services. Our services have ranged from discovery workshops and readiness assessments to full scale implementations, expansions, integrations, and core administrative support. Through these engagements, we have configured and delivered nearly every functional element and module available through the Cityworks platform, spanning both AMS and PLL. While new implementations are central to our services, we also frequently support clients seeking to expand the deployment footprint of existing implementations, which includes introducing new departments/groups, expanding functional adoption, integrating with additional enterprise systems, and more.

Integrations are a key element to empowering Cityworks as a truly enterprise system. Axim has developed custom integrations with 40 distinct systems, ranging from internally developed solutions to regional

offerings through to commercial enterprise packages. Similarly, our experience spans enterprise resource planning/management (ERP/ERM), finance and employee management, document management, citizen engagement (311), utility locates (811), document management, payment facilitation, fleet and fuel management, AVL, CCTV, pavement management, aviation and FAA integrations, and more.

A recent example of a successful project is a full Cityworks AMS implementation at the Atlanta Airport (City of Atlanta Department of Aviation) the busiest Airport in the world, where our team of Cityworks experts worked hand in hand with Atlanta Airport staff for a smooth transition from their legacy CMMS to Cityworks with minimal disruptions to daily operations. With extensive training and continued post-implementation support, we are assisting in the adoption of the new technology for mobile users and administrators alike to help them leverage the capabilities Cityworks to run their operations as efficiently as possible and to get access to critical information to maintain their expansive infrastructure.

The Axim approach to Cityworks services is structured, repeatable, and adaptable. We collaborate with our clients to ensure our efforts are aligned with priority requirements to target effective operationalization and adoption.

ArcGIS Experience

In the Partnerships section above, we outline the multiple GIS Specialty Designations we have earned over the past 30 years, this is a good representation of our capabilities but here is a further listing of some of our specific expertise. This is just a sample listing of the extensive services our team can design and deploy.

Recent Awards for Excellence in ArcGIS:

- Utility Network Implementation Award - IMGIS 2023
- Cloud Migration and Managed Services Award - Esri Business Partner Conference 2023

Axim ArcGIS Services Experience:

- Cloud Migration
- On-Premises and Cloud Managed Services
- Enterprise Portal Upgrades and Data Migrations
- Architecture Review and Design
- Geodatabase Design and Configuration
- Custom Application Design
- Integrations with third party business systems
- ArcGIS Experience Builder website design and creation
- ArcGIS Dashboard design and creation
- Geospatial data collection and data conversion
- ArcGIS Implementations – GeoEvent, Velocity, ArcGIS Hub, ArcGIS Monitor, etc.
- ArcGIS Indoors configuration and data collection

Water Utility and Utility Network Experience

As mentioned earlier Axim is focused specifically on the Water Utility industry which allows us a unique perspective to service our customers. Over the past 30 years we have worked with our water utility customers for multiple GIS solutions such as their lead and copper programs, Enterprise GIS upgrades, custom applications, real-time public facing dashboards for water boil notices, Inflow and Infiltration dashboards, Implementing ArcGIS Hub and GeoEvent Servers, Billing System Improvements, Meter reading services and most recently the Utility Network.

The Esri ArcGIS Utility Network (UN) has emerged as the next-generation technology paradigm to support

evolving industry requirements and operational efficiencies. Unlike schema/model transitions of the past, adopting the UN is far more than a data migration facilitated by ETL (extract, transform, load) processing. Fortunately, Axim has been closely engaged with Esri to through the generations of industry foundational models. This pattern continued through the release of the UN, through which we participated in the beta program for the development of the UN framework (Water Domain). Thereafter, Axim was not only the first to implement a water client into the UN, but we also became the Esri Partner with a water utility focus to earn the Network Management Specialty Designation.

Since then, Axim has facilitated the largest water implementations in the country, including Austin Water, Charlotte Water, Houston Water, and Kansas City Water. In fact, we have now supported more than 45 clients and 75 systems (e.g., water, wastewater, stormwater, reclaimed) in the transition and adoption of the UN. Our experience has allowed us to understand the complexities and nuances of implementation and the corresponding impacts the transition can have on client organizations. We apply these lessons to our portfolio of client projects and continually update our approach.

Through this process, we have shaped our service offerings to accommodate the spectrum of client requirements and constraints. Not only have we facilitated the largest implementations in the country, as referenced above, but we also have helped many smaller clients and utilities, such as Hastings, NE, Village of Niles, IL, and Mercer Island, WA, Aqua Water Supply, and Opelika Utilities, among others. While we frequently perform full UN migration services, we also conduct independent UN readiness assessments (e.g., data, organizational, functional/systemic).

Additionally, we have developed an innovative workshare approach to support clients with budgetary constraints or capacity and capability to implement with technical partnership and guidance. In short, the approach is driven by how much direct involvement the organization desires. Within a workshare, Axim serves a “technical coach”, guiding our clients through the steps. We conduct virtual work sessions throughout the project demonstrate the implementation process and serve as a guide, yet client staff complete much of the work in their system. Axim works collaboratively with clients to validate the work and provide feedback before advancing to the next steps in the implementation path. This flexible and collaborative approach allows our client to take on most project activities while having the confidence of access to expert guidance throughout.

Our experience and effort were recognized at the Esri 2023 Infrastructure Management & GIS (IMGIS) Conference, at which Axim received a Utility Network Implementation Partner Award. The award specifically recognized our work with Charlotte Water, SC – the first large water utility to adopt the UN in production, including updating their Cityworks asset management system to consume the UN.

Custom Solution Development

Axim strongly advocates for a configuration first approach to enterprise GIS solution management, but the need for custom development remains when configurable solutions cannot meet the need or when system integrations are required. Fortunately, Axim has a legacy strength in custom development and our team of Geospatial Developers have worked with every available Esri application programming interface (API) and software development kit along with interfaces from our partners and third-party platforms. We have developed solutions targeting desktop, web, and mobile users. Our team is intimate with coding best practices and a range of development languages and patterns, which allows us to accommodate clients.

Full Spectrum Services

Axim is uniquely positioned within the industry as a services provider capable of not only supporting the full spectrum of geospatial services, but beyond, extending into engineering services. We have access to

more than 1,300 professionals focused on delivering geospatial services that span the lifecycle of an GIS program, from collection, acquisition, and extraction (e.g., aerial, lidar, topobathy) to enterprise design, implementation, operationalization, and sustainment. To leverage the breadth and depth of the experience across the company, we have an internal “Big Brain” resource through which anyone in the company can reach out with questions and dynamically receive inputs that span business unit verticals, technology areas, and thematic domains. Further, by supporting geospatial services with core engineering capabilities, Axim becomes a single vendor through which clients can procure an extended range of services, which streamlines process and enhances relationships by establishing continuity.

References:

Axim has provided three references of clients below for whom services have been performed, within the last 5 years, that are comparable in quality and scope to that specified in this RFP.

Aqua Water Supply – Utility Network and Cityworks Implementation

Axim has accomplished a variety of location technology solutions for the Aqua Water Supply Corporation, including an ArcGIS for Water (AG4W) data conversion and web/mobile template implementation. Project tasks involved on-site services, and implementation of Esri’s data management, web, and mobile templates for water utilities. Currently, we are working on an ongoing project to implement the Esri Utility Network at Aqua Water.

Most recently, Axim worked with Aqua Water to implement the ArcGIS Utility Network management framework, migrating from the AG4W solutions. After a full upgrade of the ArcGIS Enterprise to version 10.9.1, the data was deployed to the client database and published through Portal. Axim then guided Aqua through their last data cleanup processes to finalize the migration. The system went into operational production in the summer of 2019.

Following the Utility Network implementation, Axim helped Aqua deploy Cityworks AMS (in Cityworks Online) to support their Operations and Maintenance efforts. With this, Aqua was one of the first organizations to take advantage of Cityworks’ native support for Esri’s Utility Network. With the success of Cityworks AMS, Aqua chose to expand their use of the technology in support of their permitting efforts with Cityworks PLL. Axim is currently wrapping up the implementation of PLL to include the Public Access portal which will facilitate online applications and payments.

CLIENT NAME/ADDRESS:

Aqua Water Supply Corporation
 415 Old Austin Highway,
 Drawer P
 Bastrop, TX 78602

CLIENT CONTACT:

Jason Kennedy, IT/GIS Manager
 512.303.3943

jkennedy@aquawsc.com

KEY FEATURES:

- Utility Network Migration
- Needs Assessment
- ArcGIS Enterprise Implementation
- Data Migration
- Cityworks AMS

DATES OF SERVICE:

2012-Ongoing

Charlotte Water – Utility Network Implementation and Cityworks Preparation

Charlotte Water is the largest public water and wastewater utility in the Carolinas, serving more than a million customers in the City of Charlotte and greater Mecklenburg County. In 2019, Axim was selected to evaluate the current state of Charlotte Water’s GIS program and readiness and help define the pathway for adoption of the Esri Utility Network for the Water and Wastewater systems.

An Axim Solutions Engineer facilitated an onsite Discovery Workshop to review the current system architecture and identify the functional and structural requirements. A detailed Implementation Plan identified the operational drivers for transitioning to the UN, including guidance on the sequence of events and tasks required to adopt the model with minimal technical disruption.

Axim then began the full implementation of Charlotte Water’s system into the UN. Axim completed our database design for the water and wastewater systems, configured specialized SSP Sync migration tools, and deployed to the development environments. After completing their integrations work, and Axim providing an intermediate system upgrade, the Utility successfully transitioned to production use of the UN and decommissioned SSP Sync. With this milestone, Charlotte Water became the first large utility in the country with a production UN.

CLIENT NAME/ADDRESS:

Charlotte Water
5100 Brookshire Blvd
Charlotte, NC 28216

CLIENT CONTACT:

Shannon Martel, GIS Manager
704.432.1373
shannon.martel@charlottenc.gov

KEY FEATURES:

- Utility Network Implementation
- Discovery Workshop
- Implementation Planning

DATES OF SERVICE:

Aug 2019-July 2021

City of Ontario – ArcGIS Cloud Deployment

Axim performed data migration, configuration, and integration services in order to migrate the City’s Park and Maintenance Department data from a legacy system (AppOrder) into the Cityworks Asset Management System. Work involved integration support with the City’s Citizen Engagement mobile application and ongoing configuration support and maintenance services.

Recent services provided by Axim include a parallel dual high-availability ArcGIS enterprise upgrade and content migration project. This involved upgrade of two parallel deployments, (one internally accessible, one publicly facing) of Portal, ArcGIS Server, and ArcGIS Data Store.

In addition, Axim provided support for the SQL Server migration to support a geodatabase upgrade to the most current version. Work on this project included migration of services, maps, and apps from existing to new sites; establishing permissions; bulk cloning of content items; republishing services; and quality assurance of results.

CLIENT NAME/ADDRESS:

City of Ontario
303 East “B” Street
Ontario, CA 91764

CLIENT CONTACT:

Choon Vu Lam, Principal IT Analyst
909.395.2092
clam@ontarioca.gov

KEY FEATURES:

- Discovery Workshop
- ArcGIS Enterprise Upgrade
- Cityworks Support
- Ongoing Support Services

DATES OF SERVICE:

2019-Ongoing

DISCLOSURES

Axim has included a response to the Disclosure Questionnaire utilizing the form in **Exhibit E**. Axim has not identified any potential conflicts of interest with the performance of this work.

PRICING

Axim has included a response to all pricing items utilizing the form in **Exhibit B**.

APPENDIX A – RESUMES

Carrie Aurit, GISP

Project Manager, Phone: 877.294.6434

Carrie is Geospatial Project Manager with a proven background in GIS technology, automation tools development, data collection and visualization in support of Emergency Management, Utility, Land Records, Planning, Environmental, Cultural Resource, Transportation, and Asset Mapping projects. Below is a sample listing of projects that she has supported.

Axim Geospatial, Dec 2021 - Present

Florida Governmental Utility Authority (FGUA), Cloud Implementation and Managed Services

- Provides Cloud implementation services including Cloud configuration, Esri environment implementation for ArcGIS server, data loading, and file migrations

City of Oregon, OH, Cloud Support

- Supports the City’s ArcGIS enterprise running in Amazon Web Services (AWS)
- Provides professional services to assist with Cloud hosting as it relates specifically to GIS
- Supports as needed Amazon EC2 Cloud support

Bowman, Cloud Managed Services

- Supports management of Cloud infrastructure
- Provides Cloud deployment and managed services

City of Oceanside, ArcGIS Upgrades, Oceanside, CA (12/21 to Present)

- Project Manager for the ArcGIS Enterprise upgrades to include installation of ArcGIS Server, Portal, Web Adaptor and Data Store
- Project involves content migration, publishing services and user training

City of Coral Gables, GIS Support Services, Coral Gables, FL (12/21 to Present)

- Project Manager providing oversight on the development of a Python application to facilitate data analysis pipeline

Work History

Employer	Position title	Position Dates
Axim Geospatial	Project Manager	12/2021-Present
ECT, Inc.	GIS Manager	01/2020 – 12/2021
SCS Engineers	Regional GIS Manager	08/2017-12/2019
AECOM	GIS Manage/Operations Manager	02/2005 – 08/2017
PBS&J	Assistant Regional Coordinator	05/2001 – 02/2005
Progress Energy	GIS Analyst	09/2000 – 05/2001
L. Robert Kimball & Associates	GIS Specialist	05/1999 – 09/2000

Experience

- 22 years

Technical Expertise

- Esri ArcGIS Desktop
- ArcPro, ArcGIS Online
- Mobile Applications
- Project Management
- Operations Management
- Renewable energy
- Emergency Planning & Management
- Asset Mapping
- Infrastructure
- Transportation
- Utilities
- Stormwater Management
- Water Supply

Education

- BA, Geography, University of Pittsburgh

Certification

- Certified Geographic Information Systems Professional (GISP)
- Certified Floodplain Manager

Tamara Dunbarr

Solutions Engineer, Phone: 877.294.6434

Tamara is a Geospatial Solutions Engineer and provides GIS solutions and database maintenance and management support utilizing Esri ArcGIS software and tools. She specializes in Amazon Web Services (AWS) cloud, ArcGIS Enterprise, and database management, deployment, and configuration, as well as providing managed services and other software and server installs and maintenance for state and local government agencies and commercial clients.

Axim Geospatial, May 2022 – Present

Conflict Armament Research, GIS System Upgrades, London UK

- Performed Upgrades of ArcGIS Server environment from Linux Ubuntu 18.04 to 20.04 on four servers across both the production and development environments.
- Installed and configured VertiGIS server and software for client use.
- Configured Amazon Web Services (AWS) services to load-balance various incoming traffic to allow for external access to ArcGIS Enterprise environments (production and development) and VertiGIS applications.

Holly Energy Partners, ArcGIS Enterprise Environment Upgrade, Dallas Texas

- Identified issues with current Windows Servers in the production environment.
- Created a migration plan to optimize and move ArcGIS Server and ArcGIS Datastore to new servers with less than six hours downtime.
- Optimized Datastore and Amazon Web Services (AWS) relational databases to work with new servers.
- Successfully migrated combined ArcGIS Server/Datastore server to new separate Server and Datastore instances in AWS with JoinSite operation.
- Performed security hardening measures to secure production ArcGIS Enterprise environment with ongoing security audits to maintain high security.
- Created and implemented AWS backup plans and procedure for all instances in the environment to prevent data loss or corruption.
- Audited all resources in AWS and removed unused resources and provided additional efficiency recommendations to provide cost-savings to the client.

Experience

- 7+ years

Technical Expertise

- Esri ArcGIS Enterprise
- ArcGIS Desktop/Pro
- ArcGIS Online
- Survey123
- Collector
- Cityworks
- Crystal Reports
- Python
- SQL Databases
- Field Maps

Education

- MS (in progress), Geography, University of Nebraska
- BS, Geography, Arizona State University

Certification

- AWS Certified Cloud Practitioner
- AWS Partner Accreditation: Technical

Work History

Employer	Position title	Position Dates
Axim Geospatial	Geospatial Analyst	Mar 2023 – Present
Axim Geospatial	Geospatial Analyst	May 2022 – Mar 2023
City of Omaha	GIS Technician II	July 2019 – May 2022
City of Omaha	GIS Intern	Mar 2019 – July 2019
University of Nebraska	Graduate Teaching Assistant	Aug 2018 – June 2019
NASA DEVELOP	Project Lead/Assistant Center Lead	June 2016 – May 2017
Various	Information Technology	1997 – 2014

Bryan Franey

Solutions Engineer, Phone: 877.294.6434

Bryan is a Solutions Engineer with 18 years of GIS experience. He has extensive experience with ArcGIS, software development, and production of geospatial products for commercial, state, local, and government clients.

Axim Geospatial, 2021 - Present

Tampa Bay Water, GIS Support Services

- Designed planned, and implemented an ArcGIS Enterprise upgrade from 10.7 to 10.9.1
- Migrated all the GIS content (geospatial services, Portal for ArcGIS, and web applications) to the new environment
- Perform GIS technical support and customer service for all GIS Help Desk support issues
- Provide client with technical guidance, expertise, and direction

McHenry County, IL, GIS Support Services

- Designed planned, and implemented an ArcGIS Enterprise upgrade from 10.5 to 10.9.1
- Migrated all the GIS content (geospatial services, Portal for ArcGIS, and web applications) to the new environment
- Provide client with technical guidance, expertise, and direction

North Central Texas Emergency Communications District (NCT9-1-1), Geospatial Cloud Services

- Designed, planned, and implemented ArcGIS Monitor 2023
- Provide monthly ArcGIS Enterprise maintenance
- Updated real-time ArcGIS GeoEvent services for Waze traffic data and stream gauge data

Walworth County, WI, GIS Support Services

- Designed planned, and implemented an ArcGIS Enterprise upgrade from 10.7.1 to 10.9.1
- Migrated all the GIS content (geospatial services, Portal for ArcGIS, and web applications) to the new environment

Pape-Dawson Engineers, Inc, Geospatial Cloud Services

- Designed and planned ArcGIS Enterprise upgrade from 10.8 to 10.9.1
- Designed and planned Migrated all the GIS content (geospatial services, Portal for ArcGIS, and web applications) to the new environment

Work History

Employer	Position title	Position Dates
Axim Geospatial	Solutions Engineer	2021-Present
Sanborn Map Company	Geospatial Data Administrator	2016-2021
Parallel Inc.	Data Administrator	2016
Esri	Solutions Engineer	2008-2014
Front Range Community College	Adjunct Professor	2013-2014
Esri	Account Manager	2006-2008

Experience

- 18+ years

Technical Expertise

- Esri ArcGIS Suite
- Production Mapping
- Data Review
- WebApp Builder
- ArcSDE Enterprise Geodatabases

Education

- BS, Geographic Information Science

Certification

- ArcGIS Desktop Associate
- ArcGIS Web Application Developer Associate
- ArcGIS Enterprise Administration Associate

Andrew Baumgartner

Solutions Architect, Phone: 877.294.6434

Andrew is a Solutions Architect with 20 years of GIS experience providing complex geospatial solution delivery, technical management, research and development, and process innovation. He specializes in process automation, GIS system integrations, and quality control. Below is a sample listing of projects that he has supported.

Axim Geospatial, Oct 2021 - Present

Hartsfield Jackson Atlanta International Airport, GIS Support, Atlanta, GA

- Leading the technical oversight and integration of various, airport operations and maintenance data, equipment location information with GIS data, applications dashboards and Cityworks

Metropolitan Airports Commission, QA/QC Viewer Dataset, Minneapolis, MN

- Solutions Architect leading the technical oversight and integration of GIS Data quality control automation; added additional datasets to the QA/QC Viewer and automated processing workflows

Metropolitan Airports Commission, QA/QC Viewer and FME Server

- Objectives included updating and modernizing the automated quality control process for ingesting and staging inspection data, installing FME server, updating manual review application and upload of validated data

Port of New Orleans, Cloud Migration and Managed Services

- Technical vision and oversight, implementation sequencing, and senior-level Esri expertise for the Port's Cloud Migration and Managed Services project; provides technical progress updates and facilitates technical discussions with the customer

Boston Water and Sewer Commission, SQL Migration and Upgrade

- Upgrade of the Esri Enterprise environment and Oracle SQL to Microsoft SQL migration project; provides technical guidance and oversight to client and staff resources along with procedure walk throughs and documentation
- Facilitates technical exchange between client, Axim staff and subcontractors

Med-Project, Data Migration and Staff Augmentation

- Coordination, scheduling, and technical oversight and guidance to staff resources
- Provided client with technical guidance, expertise and direction

Work History

Employer	Position title	Position Dates
Axim Geospatial	Solutions Architect	Oct 2021 - Present
BAE	Lead Sr Developer	Jun 2006 – Sept 2021
Colliers Lanard & Axilbund	GIS Coordinator	Oct 2005 – June 2006
General Dynamics Network Systems	GIS Analyst	Nov 2001 – Sept 2005
Passaic River Coalition	GIS Specialist	Aug 2000 – Oct 2001
United States Bureau of the Census	Geographic Clerk	Feb 2000 – April 2000

Experience

- 20+ years

Technical Expertise

- Esri ArcGIS Suite
- Production Mapping
- Defense Mapping
- Data Review
- Workflow Manager
- JavaScript API
- WebApp Builder
- Arcpy
- Python
- Jupyter Notebooks
- Safe Software FME
- FME Server
- QGIS
- Mapbox GL JS API
- Turf JS
- ESA SNAP Toolbox

Education

- BA, Geography, Rowan University

Certification

- Esri Certified Desktop Professional
- FME Certified Professional

Kent Williams

Solutions Engineer, Phone: 877.294.6434

Kent is a Solutions Engineer with over 18 years of experience in GIS. He holds an M.S. and B.S. in spatial information technology and specializes in implementation of GIS, automation of processes through Python, Extract/Translate/Load (ETL) operations, and system administration. He has delivered projects for private business, local government, and large Federal government contracts. Additionally, he has several years of experience in working with interior space GIS solutions, including floorplan data collection and existing floorplan data migration.

Axim Geospatial, May 2012 – Present

Opelika Utilities, Story Map Production and Script Updating

- Produced an ArcGIS Online story map in the City’s ArcGIS Online Organization for planned, active, and completed water projects
- Updated existing Python scripts to add new functionality

Roanoke County, ArcGIS Online Data Retrieval

- Wrote a Python script for retrieving data from several items in an ArcGIS Online Organization and extracting to a specific location

Walworth County, Geodatabase Migration

- Created several Python scripts to automate procedures such as synchronizing replicas and performing database maintenance
- Automated the process of exporting map series PDF files from ArcGIS Pro projects using a Python script
- Updated existing Python scripts that create ArcSDE feature classes and publishes them as open data items

City of Sheboygan, Enterprise Upgrade

- Assisted in design of Tree workorder management migration from custom application to ArcGIS Collector and ArcGIS Online
- Created scripting, performed testing, and troubleshooting

Work History

Employer	Position title	Dates
Axim Geospatial	Solutions Engineer	2012-Present
PenBay Solutions, LLC	Senior GIS Analyst / Technical Lead	2006 - 2012
Commons of Geographic Data, University of Maine	Project Manager / GIS Technical Expert	2006
Maine Image Analysis Laboratory, University of Maine	Work Study Assistant / Research Assistant	2003 - 2005

Experience

- 18 years

Technical Expertise

- Esri/ArcGIS Desktop and Pro, including all standard extensions.
- Installation, configuration and administration of ArcGIS Enterprise systems (ArcGIS Server, Portal)
- Python Geoprocessing script tool development, including custom toolboxes, Python Add-Ins, Python Geoprocessing services, Jupyter notebooks, and standalone scripts
- ArcGIS API for Python script creation for interacting with ArcGIS Online and Enterprise Portals
- ArcGIS Online feature service, web map and web mapping application creation

Education

- MS Forest Management, University of Maine (2005)
- BS Spatial Information Engineering, University of Maine (2004)

Certifications

- Security+ Certification, CompTIA

C. Michael Parma, GISP

Senior Solutions Architect, Phone: 877.294.6434

Michael Parma provides technical oversight and vision for the project. He is a Certified GIS Professional (GISP) with over ten years of experience in GIS for public utilities. As Senior Solutions Architect, Mr. Parma leads Axim’s ArcGIS Utility Network initiative, and brings extensive experience having managed Utility Network transition and planning projects for Austin Water, Opelika, and Aqua Water Supply Corporation. Further examples of his project experience are shown below.

Axim Geospatial, March 2012 – Present

Aqua Water Supply Corporation (Bastrop, TX)

- GIS HealthCheck for enterprise organization
- Upgrade and manage ArcGIS Enterprise platform
- Implement Esri Utility Network Management framework
- Implement Cityworks Asset Management System and integrations

Charlotte Water (Charlotte, NCI)

- Development of a detailed implementation plan
- Geodatabase design for implementation of Esri’s Utility Network Management System for water and wastewater
- Facilitate technical and business requirements workshops
- SSP Sync implementation for water, wastewater systems

San Antonio Water System (San Antonio, Texas)

- ArcGIS Utility Network Readiness Assessment for water, stormwater, and reclaimed water systems
- Implementation of ArcGIS Enterprise and migration of production environment; EOC Dashboards (Infor IPS workorders); Portal for ArcGIS and Insights for ArcGIS; GeoTab/GoFleet AVL and GeoEvent Server
- Automation of key data to support workflows

City of Houston, Utility Network Implementation (Houston, TX)

- Implementation of Esri Utility Network for Water, Wastewater, and Stormwater
- Sr Solutions Architect responsible for technical vision and data assessment for ArcGIS Utility Network; consulted on industry best practices

San Francisco Public Utilities Commission (San Francisco, CA)

- Led technical and business requirements workshops
- Supported GIS integration for Maximo upgrade
- Review data input and editing processes
- Manage onsite support staff

Experience

- 21 years

Technical Expertise

- *Esri/ArcGIS:* ArcGIS for Desktop, ArcGIS Pro, ArcGIS for Server, ArcGIS Online, ArcGIS for Water (AG4W), ArcGIS for Local Government (AG4LG), ArcGIS Extensions (Utility Network Management, Data Interoperability, Network Analyst, Spatial Analyst, 3D Analyst), ModelBuilder
- *Database:* ArcSDE, SQL Server, Geodatabase Design, Extract Translate and Load (ETL), Replication
- *Internet/Server:* ArcGIS for Server Advanced Enterprise, Portal for ArcGIS, GeoEvent Server, ArcGIS for Server Image Extension, ArcGIS Web API’s (JavaScript/HTML5, WebADF) Cityworks Asset Management, Cityworks PLL, Accela Automation, Windows Server

Education

- M.S. Forestry, Northern Arizona University (2000)
- B.S. Parks & Rec. Mgmt, Northern Arizona University (1997)

Certifications

- Certified GIS Professional
- Esri Certified ArcGIS Desktop Professional
- Esri Certified Enterprise Associate Geodatabase Mgmt

Membership

- American Water Works Assoc.

Employer	Position title	Position Dates
Axim Geospatial	Sr. Solutions Architect	11/2020 - Present
Axim Geospatial (formerly GISinc)	Technical Architect	03/2012 – 11/2020
City of New Braunfels, TX	GIS Coordinator	12/2006 - 03/2012
City of San Antonio, TX	Sr. GIS Programmer / Analyst	08/2001 - 12/2006

Chris Moussetis

Solutions Architect, Phone: 877.294.6434

Chris has 17 years of GIS experience in the utilities and facilities industry spans a variety of different roles, from field data collection technician to project manager. A vast majority of his career has involved working on-site in support of various clients. As a result, he has developed strong interpersonal skills to complement his technical skills.

Axim Geospatial, July 2012 – Present

Veolia Water North America (Nationwide)

- Technical team lead responsible for ensuring a successful Utility Network data readiness assessment and development of recommendations
- Responsible for ensuring accurate feature class, attribute, and domain level crosswalk efforts to support a Utility Network implementation
- Facilitated working sessions with client

Eastern Municipal Water District (California)

- Performed analysis of current Data Reviewer checks and developed recommendations for additional Utility Network focused checks
- Coached team to develop and provided top level review of the additional Utility Network focused checks

Austin Water (Austin, Texas)

- Developed strategy and documentation for realigning existing water and wastewater data to GPS locations

City of Galveston, TX, Utility Network Readiness Assessment (Galveston, Texas)

- Performed Utility Network data and system readiness assessment and recommendations
- Developed Utility Network Implementation Road Map

City of St. Charles Utility Network (St. Charles, Illinois)

- Performed Utility Network data and system readiness assessment and recommendations

Aqua Water Supply Corporation, GIS Support Services (Bastrop, Texas)

- Performed editing of new water distribution linear assets, post-Utility Network Implementation

Western Municipal Water District Utility Network Data Assessment (California)

- Provided Utility Network data readiness assessment and recommendations

Work History

Employer	Position title	Position Dates
Axim Geospatial	Solutions Architect	2021 - Current
Axim Geospatial	Project Manager	2012 - 2021
Alutiiq LLC	GIS Program Manager	2008 - 2011
Eyak Technology	GIS Program Manager	2008
EDM International, Inc.	On-site Project Liaison and GIS Analyst	2006 - 2007
GeoDecisions	GIS Analyst	2005 - 2006

Experience

- 17 years

Technical Expertise

- GIS Software
- ArcGIS Desktop
- Data Interoperability Extension
- GIS for utility distribution systems
- Data Management

Education

- BA Environmental Science, UVA (2002)

Certifications

- CompTIA Security+

Thomas Wilson, GISP

Cityworks Architect, Phone: 877.294.6434

Thomas is a Certified GIS Professional (GISP) with a primary focus on the implementation of Cityworks Server Asset Management Systems (AMS) and Permits, Licensing, and Land (PLL). He serves as a technical lead, responsible for planning, translating client requirements into an implementation plan, hardware/software configuration, training and support. As Axim’s Cityworks Architect, Thomas facilitates the conversion of legacy data into Cityworks, leads the Cityworks implementations, and produces database scripts for the management of Cityworks and non-Cityworks data.

Axim Geospatial, Nov 2014 - Present

City of Westminster, Cityworks AMS Implementation

- Cityworks Architect responsible for implementation of the Cityworks AMS, testing, and end-user training
- Custom integrations of Cityworks AMS with the City’s financial, fleet, pavement management, utility locates, and SCADA systems

City of Springfield, Cityworks AMS Implementation

- Implementation of the Cityworks Local Government Templates (LGTs)
- Created custom inspections to align with the City’s work processes
- Developed SQL scripts for data import

City of Billings, Cityworks AMS Implementation

- Implementation of the Cityworks LGTs
- Developed SQL scripts for legacy data conversion from in-house work management system
- Migrated inspection data from GPS collection devices into Cityworks, created inspection history using SQL scripts

Atlanta International Airport, Cityworks Implementation

- Cityworks implementation to support and streamline business operations to include logistics, personnel and asset management.

Work History

Employer	Position title	Position Dates
Axim Geospatial (formerly GISinc)	Solutions Engineer	Nov 2014 - Current
Comal County, TX	GIS Coordinator	2008 - 2014
Brazos County Appraisal District	GIS Director	2004 - 2008
Guadalupe County, TX	GIS Analyst	2004

Experience

- 18 years

Technical Expertise

- Server: Esri ArcGIS Server 9.x-10.x including ArcSDE, Oracle 10g, Microsoft SQL Server 2000-2014, SQL Server Integration Services, Microsoft Business Intelligence Development Studio
- Web: Esri ArcGIS Server, ArcGIS Online, Esri ArcIMS, Manifold IMS, Microsoft Visual Studio, Adobe CSx, Macromedia MX
- Mobile: Trimble Pathfinder, TerraSync
- Programming: VBScript, Python, ArcObjects, HTML, JavaScript, Visual Basic, ASP, PHP, .NET, CSS, Flex
- Desktop: Esri ArcGIS Desktop (ArcInfo Workstation, Spatial Analyst, Network Analyst, 3D Analyst, Data Interoperability, Spatial ETL, Publisher, Model Builder), Intergraph GeoMedia Professional, Manifold GIS, Cityworks AMS, Cartegraph AMS/ VERSAview, Datawise Data Acquisition Software, Crystal Reports, AutoCAD 14, Windows and Linux Operating Systems

Education

- MS, Geospatial Information Technologies (Delta State University) (2014)
- BS, GIS / Cartography; Minor in Mathematics (Texas State University – San Marcos) (2004)

Certifications

- Certified Geographic Information Systems Professional (GISP)
- Cityworks Server AMS Administrator Training
- Cityworks Server PLL Administrator Training

Chris Collier, GISP

Sr. Solutions Engineer, Phone: 877.294.6434

Chris is a Sr. Solutions Engineer with over 34 years of experience in GIS and enterprise systems development, implementation, and support. He has extensive experience managing professional personnel and information technology teams utilizing the latest Esri and Cityworks technologies. Below is a sample listing of projects he has supported.

Axim Geospatial, Sept 2018 – Present

Roanoke County, VA, Cityworks PLL Implementation

- Lead Solutions Engineer for Cityworks PLL Implementation for the Building and Planning and Zoning Divisions
- Configured system including workflows, permits, inspections, fees, and notifications, and led the development of reports

City of Carmel, IN, Cityworks PLL Implementation & Integrations

- Lead Solutions Engineer for Cityworks PLL Implementation that covered the Planning and Zoning, Building and Code Services, and Code Enforcement Divisions
- Developed workflows and supported a complete system configuration to include Public Access, Mobile, and reporting, and data migration from the legacy system
- Integrations with ProjectDox, and Laserfiche
- Provided in-person PLL and Cityworks administration training and post implementation support

Aqua Water Supply Corporation, Bastrop, TX, AMS Implementation

- Lead Solutions Engineer for Cityworks AMS implementation, performed discovery and configuration of all distribution related assets to include Facilities, Fleet and Production assets and work activities

City of New Braunfels, TX, Cityworks PLL Implementation

- Configured and implemented Cityworks PLL and assisted the City in migrating from Accela to Cityworks
- Implementation included full PLL configuration and Cityworks Mobile for inspectors and Public Access for contractor and citizen engagement
- Provided on-site post implementation support

Work History

Employer	Position title	Position Dates
Solutions Architect	Axim Geospatial	2018-Present
City of Round Rock, TX	IT Manager – Geospatial Applications	2002-2018
Dewberry and Davis	Sr. Project Manager	2002
GIS/Trans, Ltd	Texas Regional Manager and Unit Supervisor	1999-2002
TxDOT	Engineering Technology Services Branch Manager	1995-1999
NGA	Systems Manager	1988-1995

Experience

- 34 years

Technical Expertise

- Esri ArcGIS – Desktop, SDE, and ArcGIS Online
- SQL Server
- Microsoft Access, Project, and Visio
- TRAKiT-Land Development Tracking and Permitting software
- Cityworks AMS and PLL
- ITPipes
- Transact-SQL
- Crystal Reports

Education

- BS, Applied Geography, Texas State University

Certifications

- Certified Geographic Information System Professional (GISP)

Exhibit B: Schedule of Charges

Project Component 1: ArcGIS Enterprise Cloud Deployment

For Project Component 1, Axim is proposing a fixed price engagement according to the price summary table that follows with monthly invoices based on percent complete.

Item Description	Frequency of Charge	Amount
Required licensing*	Annual	\$ 1,150
Initial setup of ArcGIS Enterprise	One-Time	\$ 62,200
Hosting Fees**	Annual	\$ 43,100
Managed Services***	Annual	\$ 47,250
TOTAL		\$ 153,700

* The required licensing covers only the SSL certificate and virus protection (Cylance), all other software licensing will be procured/provided by MSWD and deployed to the cloud environment as appropriate.

** Hosting fees (AWS) and managed services (Axim) are proposed as fixed price based on an annual period to ensure optimal pricing and economy of scale. A deviation from that time frame will require re-estimation and revision to the proposed price.

*** Managed services (Axim) are proposed as fixed price based on an annual period to ensure optimal pricing and economy of scale. A deviation from that time frame will require re-estimation and revision to the proposed price.

Project Component 2: Import Existing Data and Ensure Readiness

For Project Component 2, Axim is proposing a fixed price engagement for **\$ 56,300** with monthly invoices based on percent complete.

Project Component 3: Migrate Data into ESRI Utility Network

For Project Component 3, Axim is proposing a fixed price engagement for **\$ 225,800** with monthly invoices based on percent complete.

Project Component 4: Cityworks Implementation

For Project Component 4, Axim is proposing a fixed price engagement for with monthly invoices based on percent complete.

Item Description	Frequency of Charge	Amount
Cityworks Implementation Services (Axim)	One-Time	\$ 406,150.00
AMS ELA Cityworks Online Premium* – Year 1 (Trimble)	Annual	\$ 46,887.50**
TOTAL		\$ 453,037.50

* The proposed AMS ELA software is for Cityworks Online for up to 40 named logins to include Respond, Mobile Native Apps (iOS/Android), and Office (Admin and Reporting only) with the following add-ons: Storeroom, Equipment Checkout, Contracts, Cityworks for Excel, Cityworks Analytics AMS, eURL, Operational Insights, Workload, OpX (Project, Contracts, Budgets), a Sandbox, and Cityworks AMS APIs.

** Trimble is offering a discounted software price for the AMS ELA that incrementally increases to \$49,281.25 in Year 2 and then \$51,875.00 in year 3.

Project Component 5: Staff Augmentation

Axim offers a variety of procurement models for staff augmentation and ad hoc support to our clients, with options for volume-based discounting.

Prepaid Support Block Option:

Axim offers a contract vehicle we refer to as a support block which provides a *prepaid* option that offers clients a blended rate based on volume (number of hours) procured over a designated period (expiration in 12-months). An invoice will be issued for the approved amount immediately following an executed contract.

The following table presents hierarchical, blended hourly rates under the prepaid support block option based on the total volume of hours purchased:

Hours	Hourly Rate
115 to 161	\$217.00
165.5 to 283.5	\$211.50
292+	\$205.50

Time & Materials Support Block Option:

Alternatively, given that the Axim team is comprised of highly varied technical skills (labor categories) and seniorities (e.g., staff, senior), we also offer support blocks with variable hourly rates (presented in the table below. Through these “pay as you go” contracts, clients have access to Axim technical resources as necessary and for however much time is desired according to an approved budget.

MSWD will be invoiced monthly for all labor based on the hours worked and associated expenses incurred (if any) in the previous month. Supporting details will be provided in the monthly status reports to detail hours, rates, and deliverable(s) performed during the preceding month.

Labor Category	Staff	Senior	Consultant
Geospatial Developer	\$223.46	\$268.15	
Geospatial Project Manager	\$241.48	\$298.53	
Project Coordinator	\$124.63	\$145.52	
Solutions Architect	\$241.48	\$298.53	
Solutions Engineer	\$223.46	\$268.15	
Application Architect	\$268.15	\$298.53	
Enterprise Architect			\$ 270.38
Geospatial Analyst	\$150.19	\$179.53	
Management Consultant			\$ 281.19
Subject Matter Expert		\$305.91	\$ 319.04

Assumptions

- General
 - The scope of work requested encompasses interdependent project components that span multiple enterprise strategies, technologies, and platforms. The approach proposed by Axim addresses all scope areas with corresponding technical approach and pricing. Given the interdependencies between the project components, the overarching proposal cannot be considered à la carte. If MSWD opts to award or implement a subset of the components, the proposed pricing and respective scopes may need to be revisited and resubmitted.
 - All work will be performed remotely unless explicitly stated otherwise.
 - If/as necessary, access to the MSWD systems will be facilitated through VPN or comparable solution with similar security and performance. This project assumes that MSWD will provide the Axim team access in a timely and efficient manner.
 - All software licensing (Esri, RDBMS, SQL, Cityworks, other third-party, etc.) and associated/required APIs must be provided by MSWD.
 - MSWD will provide timely responses and input as requested or required throughout the engagement to maintain project momentum and schedule.
 - MSWD has and will provide facilities capable of supporting the workshops and training events (onsite or remote), including room, projector, workstations, internet access, etc.
 - Any changes to the scope identified during the respective design phase, which are subject to a change management processes, to include impact to schedule, budget, and project risk.
- Project Component 1: ArcGIS Enterprise Cloud Deployment
 - Changes or additions to the Cloud environment configuration or footprint (e.g., servers, instances, workstations) will trigger an evaluation and may require a change order to support.
 - Pricing requires a 12-month contractual commitment.
 - As proposed, Axim will procure the Cloud environment/infrastructure from the Cloud provider (AWS), which will include a 10% fee that can be eliminated if MSWD procures the infrastructure directly.
 - Cloud fees are based on estimates and are subject to review/change upon renewal.
 - Axim will obtain and apply SSL certification (GoDaddy) and Anti-virus (Cylance) on behalf of MSWD for the AWS Cloud environment. The associated fees are included in the initial setup and annual renewal.
 - Axim Cloud services are designed to facilitate the health and availability of the host environment only and does not include ad hoc or request driven support for broader GIS tasking, administration, or technical support, which may be requested under the supplemental support block projects.
 - The performance or responsiveness of the proposed Cloud infrastructure may be influenced by the bandwidth/capacity of the network through which the infrastructure is accessed, which is beyond the control of Axim and considered to be out of scope.
 - Axim is not responsible for Cloud infrastructure availability, which falls to the respective infrastructure provider.
 - Software version upgrades are not included in the standard managed services, but supplemental services are available upon request.
 - The software version will be upgraded to ArcGIS Enterprise 11.1. Any change to the target upgrade version throughout this project will require mutual agreement and may trigger a change order.
 - Within the scope of Project Component 1, Axim is not proposing to migrate content, including data, services, or solutions into the newly established Cloud environment. Content migration will occur in subsequent project components as indicated.
- Project Component 2: Importing Existing Data and Ensure Readiness
 - Axim is not responsible for any data creation, generation, cleansing, or transformation not otherwise specified.
 - The proposed services do not include scripted or automated synchronization or reconciliation of GIS data between multiple data sources not otherwise specified.

- Editing and maintenance of Cloud hosted geospatial data will be facilitated via ArcGIS Map/Pro through feature services and is the responsibility of MSWD.
- MSWD will coordinate a migration window as part of the final production transition, during which data editing will be disrupted. The duration of this period will be minimized to the extent supported by the source structure.
- Project Component 3: Migrate Data into Esri Utility Network
 - MSWD has or will acquire adequate licensing for ArcGIS Enterprise, ArcGIS Utility Network, Microsoft SQL Server, and FME/ArcGIS Data Interoperability software.
 - Axim will implement the official Esri Network Management Release of the ArcGIS Utility Network available at the time of implementation, presently ArcGIS Enterprise 11.1 and ArcGIS Pro 3.1.
 - Software versions related to the implementation of the UN (e.g., Esri, SQL Server) will remain static from the point of project kickoff through final acceptance unless mutually agreed upon.
 - MSWD stakeholders have suitable familiarity with business and functional requirements to provide input that can accurately shape the design of the geodatabase.
 - MSWD GIS technical architecture will meet or exceed the minimum technical specifications required for ArcGIS Enterprise and ArcGIS Utility Network before implementation.
 - MSWD will be responsible for any data aggregation, cleanup, or reconciliation before providing input or reference data to Axim. Additional support may be requested through Staff Augmentation.
 - While Axim will make every effort to review the data during our initial pilot testing processes, MSWD staff will confirm that all source features were migrated into the proper UN asset type and that the attribution has completely migrated as expected.
 - At the final transition point, MSWD will facilitate a data freeze to exclude editing for a mutually agreed-upon time window during which final migration will occur.
 - MSWD will be responsible for communicating business system dependencies based on local knowledge. Dependencies not shared or known by MSWD will not be addressed as part of this scope.
 - Design and development related to specific business system integrations are not within the proposed project scope. Instead, general requirements to support those integrations will be noted while avoiding the specific technical implementation needs.
 - MSWD will address business system integrations after the production release of the UN.
 - FME/ArcGIS Data Interoperability software will be used for the data migration. However, if MSWD decides to use another approach during the project, adjustments to the project scope may be required. Corresponding budget/schedule impacts will be communicated for review and approval.
 - Axim is not responsible for resolving issues determined to result from Esri or other third-party solutions, product or platform-related defects, or similar.
 - Training and knowledge transfer are meant to provide contextual knowledge on the Client environment rather than replace formal Esri training on ArcGIS Pro and the ArcGIS Utility Network.
- Project Component 4: Cityworks Implementation
 - MSWD stakeholders participating in the requirements workshops will have the knowledge and authority to articulate workflows and functional objectives to be accommodated by Cityworks and the proposed set of integrations.
 - Functional requirements that emerge or evolve throughout the period of implementation (items not explicitly referenced in the proposal and requirements documentation) may require a change order or may be noted for development/configuration in a subsequent phase or project.
 - MSWD will be responsible for publishing GIS services, including any desired cartographic presentation, with input from Axim regarding the content necessary to support Cityworks.
 - The software versions being deployed, as mutually agreed upon, as well as any source or dependent system versions will not be altered or upgraded during the implementation without written notice to and agreement from

Axim.

- Axim will report any issues identified with the Cityworks software directly to Trimble for confirmation, consideration, resolution, but Axim is not responsible for any tasks that require alteration of the software base code.
- Defects, bugs, or issues identified within the project and attributed to a third-party software are beyond the proposed scope given that Axim is unable to alter the corresponding source code. The defect will simply be reported to the vendor.
- Axim is responsible for resolving configuration issues that reflect a deviation from the initial requirements documentation, however, changes or alterations from those initial requirements will be considered out of scope and may require a change order.
- Testing and acceptance will be performed in contrast with requirements documentation and prepared and approved as part of the initial workshops.

Integrations

- MSWD will provide the Axim Team any required access to lower tier instances for each system we are interfacing with.
- MSWD will be responsible for configuring Cues GraniteNet, DigAlert, etc., or coordinating with the vendor, to support the APIs and other access required for integration development, testing and deployment, including procurement and validation of licensing for API access to these systems.
- Integrations will be developed using published APIs. Where APIs are insufficient or not available, an alternate approach to integration may be required which could require a change to project schedule, budget or risk.
- The proposed approach and proposal do not include any customizations, if required, of the third-party platform (e.g., DigAlert), and assumes that all functional requirements can be achieved through their available APIs.
- All requested integration functionality must be supported by Cityworks and third-party software APIs.
- **Project Component 5: Staff Augmentation**
 - Rates and contract vehicle will be established in collaboration with MSWD based on preferred contract vehicle and volume of hours procured.

Exhibit D: Consultant Questionnaire

1. How many years of experience does your organization have in the setup, administration, and maintenance of virtual ArcGIS Enterprise server environments?
 - a. Axim has 10+ years of experience and has been involved in the setup, administration and maintenance of virtual ArcGIS Enterprise server environments since the creation of ArcGIS Enterprise in 2013/2014.
2. How many years of experience does your organization have in the implementation, integration, and management of Cityworks?
 - a. Official Cityworks Implementation Business Partner since February 1, 2013, however, our experience providing Cityworks related implementation services dates back to 2008
3. Will your organization be performing all projects listed in the scope of work of this RFP? If not, please list the other organizations involved, what they will be responsible for completing, what certifications they hold that show they are qualified to perform the work and who will be responsible for managing them in your organization.
 - a. Yes – Axim will complete all of the work.
4. If MSWD desired to assume full management of the environment and cease business with your organization, describe the turnover process. This includes what is required for MSWD to have full ownership of the environment (i.e., the cloud tenant) and the hosting costs.
 - a. Axim plans to establish the cloud tenant in MSWD's name and prefers to have the hosting costs be billed directly to MSWD. In this case MSWD is the owner and Axim is the administrator. At any point MSWD can cease business with our organization and MSWD will have full ownership.
5. Will anyone within your organization, or organizations you will utilize, have access to our data that are not located within the USA?
 - a. No – only people within the USA will have access to the data
6. Describe how unauthorized access to our data will be prevented and monitored.
 - a. For data transfers Axim uses a combination of USGCB guidance and CIS Benchmarks for development of all base operating systems, configuration scripts, and configuration files deployed within the system. These baselines help to ensure that only essential functions, ports, protocols, and services are enabled for each system component role. Data that moves outside of organizational boundaries is protected via encryption using secure protocols.
 - b. Security protocols are put in place at the Enterprise level with authentication measures at the database level and at the client level. Security measures are put in place at the Cloud level with identity management security and service level security. This forms a fundamental layer of security ensuring that only authorized personnel can access information which mitigates the risks of unauthorized access and potential data breaches.
7. Have you performed background screening on all administrators within your organization that will have access to our data?
 - a. Yes, all employees go through a background screening that includes the following:
 - i. County; Multi-State; and for last 7 years
 - ii. SSN Trace
 - iii. DOJ Sex Offender (2 states don't permit this screen)
 - iv. ED Verification; Employment Verification; Fed last 7 years; and OFAC is done for Project Screenings when client contract requires such as Federal/DOD
 - v. Drug Screening--9 or 10 panel is done for pre-employment (9 in NY based on state law)

vi. MVR is for any new hire based on the state DL is issued.

*Any employment action based on the background or drug screening is done in accordance with FCRA Adverse Action procedures.

8. Please provide a network diagram of your proposed network design for the ArcGIS Enterprise, Utility Network, and Cityworks implementation. *Network diagram can be included as a separate document that is referenced here.*
 - a. See attached document
9. Please provide the recommended CPU, RAM, and storage for each virtual machine in the environment. *Information can be included as a separate document that is referenced here.*
 - a. Operating system (Windows), License (Included), Bundle type (PowerPro (8 vCPU, 32GB RAM)), Root volume (80 GB), User volume (100 GB)
10. Will you be setting up the ArcGIS Enterprise cloud environment manually, or will you use an automated deployment template? If using a template, where did you acquire the template?
 - a. We will be setting up the cloud environment manually
11. Please describe your recommended VDI (Virtual Desktop Infrastructure) solution for our ArcGIS Pro user(s).
 - a. Operating System
 - i. 64-bit Windows 10-11, Pro or Enterprise
 - b. Hardware
 - i. CPU: 2x Hyperthreaded Hexa Quad Core
 - ii. RAM: 16GB
 - iii. Storage: SSD 10GB free space
 - iv. Video: DirectX 11 feature level 11.0; Shader Model 5.0; OpenGL 4.5; 2 GB RAM; and the EXT_texture_filter_anisotropic, EXT_texture_compression_s3tc, EXT_swap_control, and ARB_shader_draw_parameters extensions.*
 - c. Microsoft .NET Framework 4.6.1 or later must be installed before installing ArcGIS Pro 2.0.
 - d. Microsoft Internet Explorer 11 must be installed before installing ArcGIS Pro.
 - e. vGPU
12. Upon signing the contract and approval to proceed, please provide a rough initial estimate of the time required to complete each of the projects below, as described in Exhibit A – Scope of Work
 - a. Project Component 1: ArcGIS Enterprise Cloud Deployment
 - i. 3 month project
 - b. Project Component 2: Import Existing Data and Ensure Readiness
 - i. 6 month project
 - c. Project Component 3: Migrate Data into ESRI Utility Network
 - i. 6 month project
 - d. Project Component 4: Cityworks Implementation
 - i. 9 month project
13. Please list at least 3 clients comparable to MSWD for whom you have done similar projects and can be used as references.
 - a. Aqua Water Supply Corporation
 - i. Jason Kennedy, 512.303.3943, jkennedy@awuawsc.com
 - b. Charlotte Water
 - i. Shannon Martel, 704.432.1373, shannon.martel@charlottenc.gov
 - c. City of Ontario
 - i. Choon Vu Lam, 909.395.2092, clam@ontarioca.gov

14. Please provide a list of relevant active certifications/licenses held by your organization.

- a. Esri Specialty Designations
 - i. ArcGIS Cloud Services
 - ii. ArcGIS System Ready
 - iii. Indoor GIS
 - iv. ArcGIS Hub
 - v. Utility Network Management
 - vi. State and Local Government
- b. AWS Select Tier Services Partner
- c. Safe Software Business Partner
 - i. Certified FME Consultant

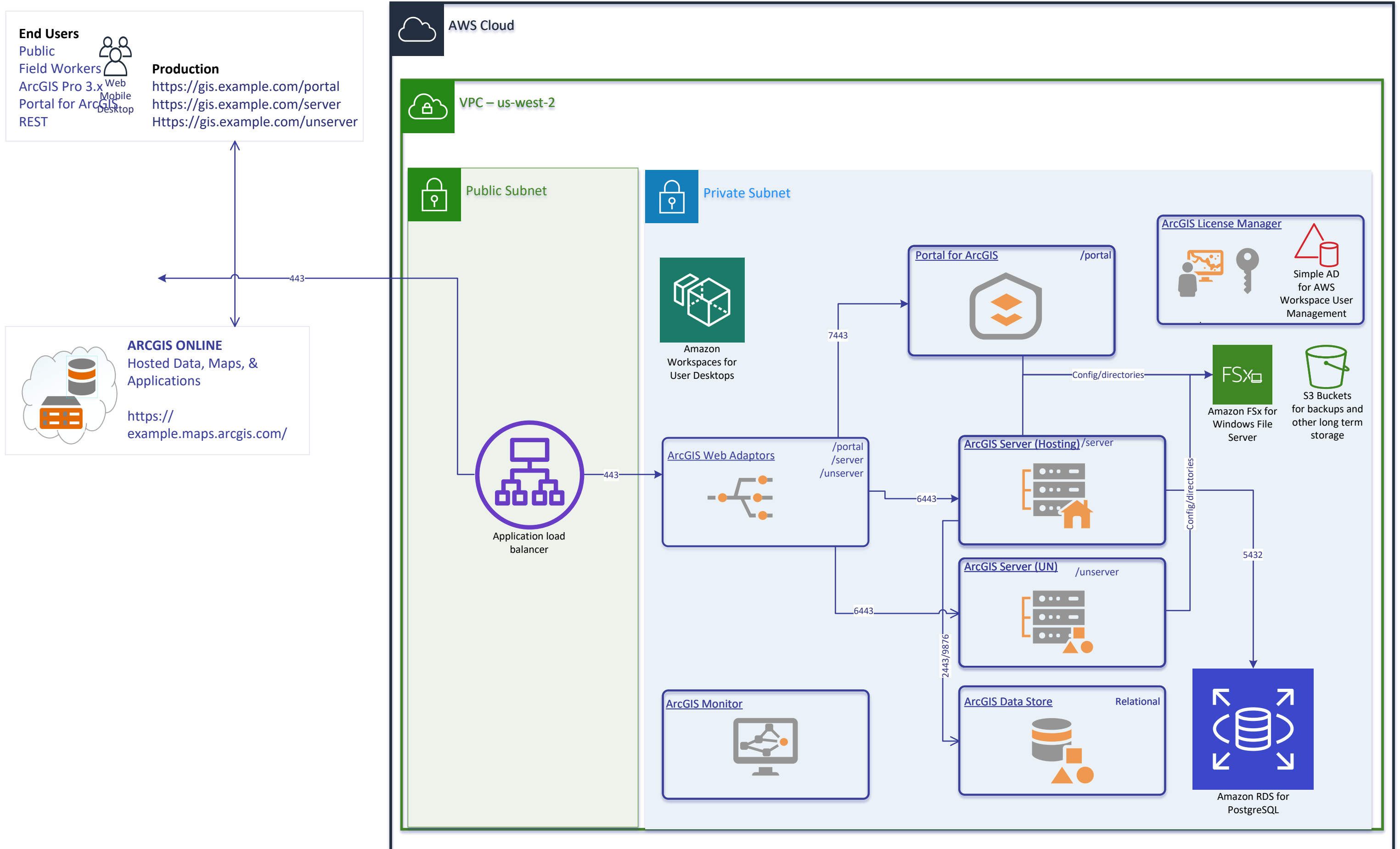


Exhibit E: Disclosure Questionnaire & Qualification Statement

Consultant Name: Axim Geospatial, LLC

1. ORGANIZATION

1.1. How many years has your organization been in business as a Consultant?

Axim has been in business as a consultant for over 31 years.

1.2. How many years has your organization been in business under its present name?

Axim has been in business under its present name for 2 years.

1.2.1. Under what other names has your organization operated?

Axim has operated under the following names:

- **Continental Mapping Consultants, LLC**
- **Continental Mapping Consultants, Inc.**
- **Geographic Information Systems, Inc.**
- **TSG Solutions, Inc.**

1.3. If your organization is a corporation, answer the following:

1.3.1. Date of incorporation: **01/06/2022**

1.3.2. State of incorporation: **Delaware**

1.3.3. Corporate ID number: **84-4764173**

1.3.4. President's name: **Dan Levine**

1.3.5. Agent for Service of Process: **CT Corporation**

1.4. If your organization is a partnership, answer the following:

1.4.1. Date of organization: **N/A**

1.4.2. Type of partnership (if applicable): **N/A**

1.4.3. Name(s) of general partner(s): **N/A**

1.5. If your organization is individually owned, answer the following:

1.5.1. Date of organization: **N/A**

1.5.2. Name of owner: **N/A**

1.6. If the form of your organization is other than those listed above, describe it and name the principals: **N/A**

2. LICENSING

2.1. List jurisdictions and trade categories in which your organization is legally qualified to do business and indicate registration or license numbers, if applicable.

Special licensing is not required to perform this work. Axim is registered with the CA secretary of state to legally conduct business. Axim operates under the following NAICS codes:

541370	Surveying and Mapping (Except Geophysical) Services (Primary, per SAM.gov)
541330	Engineering Services
541340	Drafting Services
541360	Geophysical Surveying and Mapping Services
541511	Custom Computer Programming Services
541512	Computer Systems Design Services
541519	Other Computer Related Services
541715	Research & Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
541990	All Other Professional, Scientific, and Technical Services

2.2. List any other certifications held by your organization, and the name under which they are held.

Special certification is not required to perform this work. Axim is registered with the CA secretary of state to legally conduct business. Axim staff hold the following certifications:

Professional Certs	Professional Licensed Surveyors	1
	GISPs	23
	PMPs	8
	Certified Scrum Master (CSM)	2
	Certified Photogrammetrists (CPs)	2
	AWS Partner Accreditation: Technical	2
	AWS Certified Cloud Practitioners	3
	AWS Sales Accreditation: Business	1
	MS Azure Certification	2
	UAS FAA Part 107 Certification	2
Esri Certs	Esri ArcGIS Desktop Associate (EADA)	2
	Esri ArcGIS Desktop Professional (EADP)	4
	Esri Enterprise Administration Associate (EEAA)	2
	Esri Enterprise Administration Professional (EAEP)	1
	Esri Web Application Developer Associate (EWDA)	3
	Esri Enterprise Geodatabase Management Professional (EGMP)	2
	Esri System Design Associate (ESDA)	1
Other	GeoINT Professional	1
	Certified FME Professional	1
	Security +	34

3. EXPERIENCE

3.1. List the categories of work that your organization normally performs with its own forces.

Axim normally performs, with its own forces, work under the following categories:

- Geographic Information Services

- **Surveying and Mapping Services**
- **Engineering Services**
- **Drafting Services**
- **Research & Development in the Physical, Engineering, and Life Sciences**
- **Custom Computer Programming Services**
- **Computer Systems Design Services**
- **Other Computer Related Services**
- **Other Professional, Scientific, and Technical Services**

3.2. Has your organization, under its current name or any previous names, ever failed to complete any work/contract awarded to it? (If Yes, please explain)

Axim has never failed to complete any work/contract awarded to it.

4. CLAIMS AND LAWSUITS

4.1. Are there any judgments, lawsuits, administrative proceedings, claims, arbitration proceedings, suits pending or outstanding, or other exposures against your organization or any its officers? *(If Yes, please describe)*

Axim does not have any judgements, lawsuits, administrative proceedings, claims, arbitration proceedings, suits pending or outstanding, or other exposures against the organization or any of its officers.

4.2. Has your organization filed any lawsuits or requested arbitration with regard to any of its contracts within the last five (5) years? *(If Yes, please explain)*

Axim has not filed any lawsuits or requested arbitration with regard to any of its contracts within the last five (5) years.

4.3. Has the Consultant, any officer of the Consultant, or any employee of the Consultant who has proprietary interest in the Consultant, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or safety regulation? *(If Yes, please explain).*

Axim, any officer of Axim, or any employee of Axim who has proprietary interest in Axim, has never been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of violation of law or safety regulation.

5. CONFLICTS OF INTEREST

5.1. Please disclose any and all past or current business and personal relationships with any current District elected official, appointed official, or family member of any current District elected official, or District employee. Any past or current business relationship may not disqualify the firm from consideration.

Axim does not have any past or current business or personal relationships with any current District elected official, appointed official, or family member of any District elected official, or District employee.

5.2. Provide a statement disclosing any past, ongoing, or potential conflicts of interest that your firm, proposed staff, or any subcontractors may have as a result of performing this work.

Axim, Axim proposed staff, and Axim proposed subcontractors do not have any past, ongoing, or potential conflicts of interest as a result of performing this work.

- 5.3. If there is a real or perceived conflict of interest that exists with the submission of a proposal or would exist if the Proposer entered into an Agreement with the District in this proposal, full details should be provided in this section. Detail a plan to manage the conflict of interest.

N/A

- 5.4. If there is no conflict of interest, then provide such statement in this section.

There is no conflict of interest.