



Proposal No. SQ-87-DE-19-33 for Design Services

Master Plan of Storm Drain Update

Submitted to



Submitted by



June 9, 2022

Master Plan of Storm Drain Update

TABLE OF CONTENTS

SECTION	PAGE
Cover Letter	1
Project Team	2
Scope of Work	3
Project Schedule	7
Fees	7
Relevant Projects	8
Hourly Rates	10
Appendix - Resumes	



DAVID EVANS
AND ASSOCIATES INC.

June 9, 2022

Mr. Sid Lambert
Purchasing Office
City of Fontana
8353 Sierra Avenue
Fontana, CA 92335

Re: Proposal to Provide Design Services for Master Plan of Storm Drain Update (SQ-87-DE-19-33)

Dear Mr. Lambert and Selection Committee Members:

David Evans and Associates, Inc. (DEA) is pleased to submit our proposal for the Fontana Storm Drain Master Plan Update. The City of Fontana (City) has experienced significant growth since the last comprehensive evaluation of the City's master plan in 1992, that was completed by our legacy company Hall & Foreman. Several updates to the 1992 master plan have been evaluated over the last 30 years which have deviated from the original plan. The City needs the chosen consultant to integrate the already constructed 1992 master plan facilities, the new development facilities, and existing facilities to see where hydraulic constrictions exist and determine the most cost-effective way to alleviate the constrictions.

The benefits of working with DEA include:

- **Extensive Understanding and Knowledge of the Proposed Project:** DEA understands the importance of this project for the City. Our scope, approach, and clarifications reflect our experience with similar projects for the City including the North Fontana Drainage Master Plan Study and the South Fontana Master Plan of Drainage Alternative Analysis for the Sierra Avenue Detention Basin.
- **Senior Project Manager that Specializes in City Master Plans:** Project Manager Rebecca Kinney has more than 20 years of experience with City Storm Drain Master Planning in Southern California. She strongly believes that the best master plans are living documents that can be easily updated in the future, and facilitate City transparency on public funding of storm drain infrastructure. Based on her vast experience, she has crafted our scope and approach to help the City focus it's funding on the areas within the City that are in most need of improvements. Rebecca has used this approach recently on the Yorba Linda Master Plan of Drainage which includes extensive GIS updates and focuses on specific watersheds in the city.
- **Quality Control with a Manager that completed previous Master Plans for the City and surrounding areas:** Gavin Powell will serve as the Quality Control Manager and bring his wealth of knowledge on the City's storm drain system to the team. He has also authored several neighboring city storm drain master plans.

From recent conversations with the City, we have learned that a successful Master Plan will focus on the older parts of the City between I-10 and I-210 [Area of Study (AOS) 1 in the RFP] where fewer of the 1992 master plan facilities have been constructed. Other areas of interest (AOS 2 & 3) will be evaluated in less detail. Additional key elements include:

- Collecting and Evaluating Data
- Evaluating facilities constructed since the 1992 Master Plan
- Identifying potential deficiencies in the current system
- Assessing future development areas and corresponding facility needs
- Collaboratively prioritizing capital improvement program (CIP) projects for each of the AOS
- Preparing documentation including updated Master Plan Maps and costing of projects.

We pride ourselves with consistently delivering solutions that are practical, applicable, fundable, and cost-effective. Working collaboratively with our clients, we deliver successful projects and work products that are right-sized and of high-quality.

As project manager, I am pleased to present this proposal and our team of experts that will continue to work closely with you to meet your expectations.

Sincerely,

David Evans and Associates, Inc.

Rebecca Kinney, PE, CFM
Project Manager

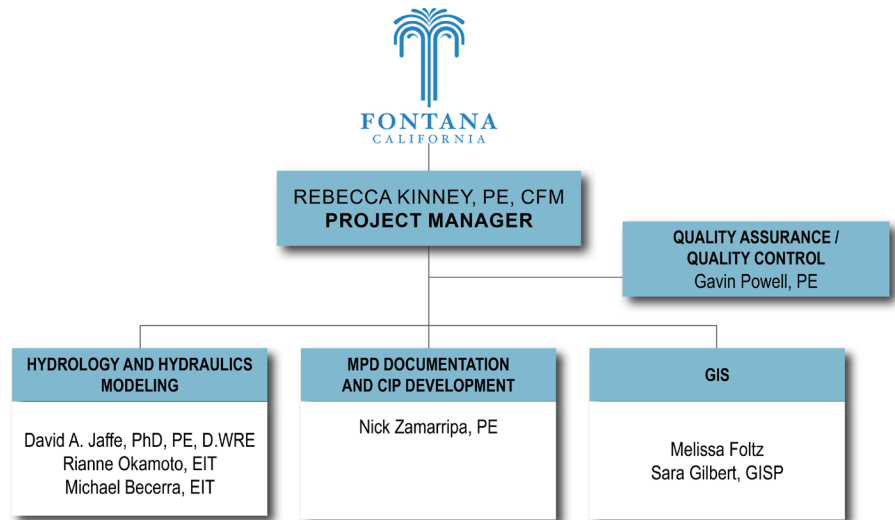
Master Plan of Storm Drain Update

PROJECT TEAM



As illustrated in the organization chart to the right, DEA has the expertise and staff resources to successfully deliver this project. Our team will be led by **Project Manager Rebecca Kinney, PE, CFM**.

She has extensive experience in all phases of stormwater management projects including planning, design, and construction. Her recent experience has focused on the development of master plans of drainage, which focus on storm drainage facility sizing, stormwater NPDES compliance, stream stability, and floodplain management. Her planning experience includes large municipal planning and master planned communities, as well as supporting hydrologic and stormwater quality analysis as a basis for CEQA documentation.



Staff Name	Years of Experience	Education / Registration	Experience
Rebecca Kinney	26	BS, Civil Engineering / PE, CA #58797 Certified Floodplain Manager, (19-11256)	<ul style="list-style-type: none"> Rancho Mission Viejo Runoff Master Plans and Drainage Design Santa Ana Storm Drain Master Plan Yorba Linda Master Plan of Drainage
Gavin Powell	22	BS, Civil Engineering / PE, CA #67187; PE, OR #63117	<ul style="list-style-type: none"> North & South Fontana Drainage Master Plan Study Ontario Master Plan of Drainage Update Rialto Master Storm Drain Plan Update
David A. Jaffe	21	PhD, Civil and Environmental Engineering; MS, Civil and Environmental Engineering, 2002; MS, Physical Marine Science; BA, Earth and Planetary Sciences / PE, CA#68321	<ul style="list-style-type: none"> Planning Level Technical Study Cahuilla Band of Indians Roadway Culvert Improvements Avenue 50 Extension Coachella I-10 / Avenue 50 Interchange
Rianne Okamoto	6	BS, Civil Engineering / Engineer-In-Training, CA #162501; PE, OR #100192PE; PE, WA #22014639	<ul style="list-style-type: none"> Rancho Mission Viejo Runoff Management Plans Yorba Linda Master Plan of Drainage Dominguez Channel Watershed Study
Michael Becerra	8	BS, Civil Engineering/ Engineer-in-Training, CA #151952	<ul style="list-style-type: none"> North Fontana Drainage Master Plan Study South Fontana Master Plan of Drainage Rialto Master Plan of Drainage Update
Nick Zamarripa	10	BS, Civil Engineering; MS, Civil Engineering: Emphasis in Water Resources / PE, CA # 86476	<ul style="list-style-type: none"> Master Plan of Storm Drainage for North and West Santa Ana River Tributary Areas Los Peñasquitos Watershed Drainage Master Plan Avenue 50 Extension – La Entrada Development
Melissa Foltz	22	BS, Horticulture Science/Landscape Design, 2000	<ul style="list-style-type: none"> Lebanon Storm Drainage Master Plan and West Side Sanitary Sewer Interceptor Roadway Capital Improvement Plan (RCIP) Update
Sara Gilbert	25	MS, Earth Sciences (GIS); BS, Geography / GISP	<ul style="list-style-type: none"> Alderwood Tap 115kV Transmission Project West Side Sanitary Sewer Interceptor Analysis Willamette Water Supply Program Preliminary Design and Permitting

Master Plan of Storm Drain Update

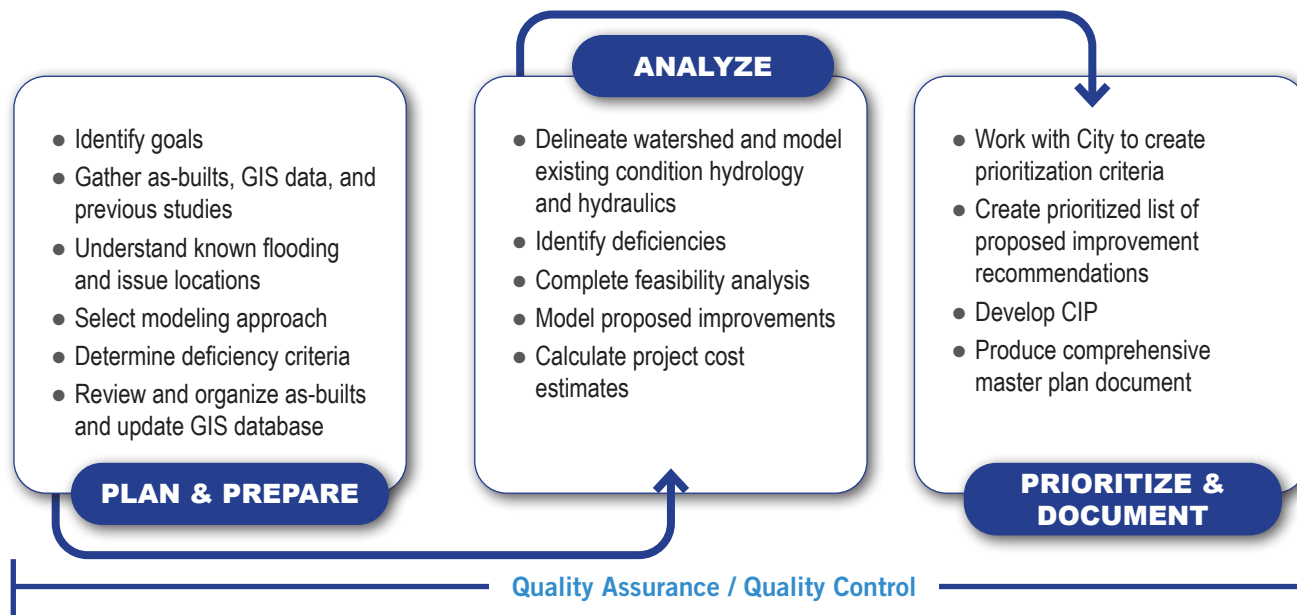
SCOPE OF WORK

Based on the RFP scope of work and our extensive experience in Storm Drain Master Planning, we have developed the following approach and clarifications for each of the scope tasks. Woven through each of the scope task items is our overall approach to the project challenges presented below:

Challenge	Solution
<p>Data – Storm Drain Master Plans are only as good as the data used to create them.</p>	<p>Thoroughly review the existing City data and develop an approach that will allow for detailed hydraulic modeling in areas where it is recommended and less detail in areas where models are not required.</p>
<p>NOAA 14 Rainfall Data – In the Fontana area, the difference in rainfall is up to 25% more than what was used in the 1992 Master Storm Drain Plan (MSDP) (NOAA 2).</p> <p>The updated NOAA Atlas 14 publication includes data from several rain gauges which were not available at the time of the prior publication of NOAA Atlas 2, as well as 25 years of additional data at several of the rain gauges used in NOAA Atlas 2.</p>	<p>It is important to utilize the increased rainfall rates as much as possible as higher runoff is expected to enter the storm drain system. Planning and design using the updated rainfall records will help extend the useful life of the system. Past studies have used a combination of NOAA 2 and NOAA 14, however, we recommend requiring future development to mitigate to the NOAA 2 runoff levels. The update would then consider evaluating each system for future design guidelines as far as what rainfall design standard should be used for master plan CIP projects.</p>
<p>Deviations from 1992 MSDP – Several areas have deviated from the current MSDP, which may have resulted in downstream deficiencies.</p>	<p>After assessing the areas that have deviated from the 1992 MSDP, DEA will determine the impact on the existing storm drain infrastructure and then determine if additional storm drain improvements are required as part of the master plan.</p>
<p>Land Use Changes (between 1992 MSDP and current general plans) – Brief evaluation of the Land Use in the 1992 MSDP land use and the current general plan land use shows that the 1992 MSDP used ¼ acre lots, while the newer development in the City appears to be a higher density.</p>	<p>DEA's overall approach is to use as much of the 1992 Master Plan as possible to minimize the cost of preparing the study. Therefore, one of the first overall tasks during our data collection will be to provide a land use difference map for evaluation prior to any modeling.</p>
<p>Existing Floodplains in the City – Floodplains in the City present challenges to storm drain master plans because they produce high tail waters for tributary storm drain connections. High tail waters limit the capacity a storm drain can convey and require more complex modeling procedures for large systems.</p>	<p>Floodplains in the City extend from the Etiwanda/San Sevaine channel on the west end of the City (AOS 01 and 2) and in the West Fontana Channel Area (AOS 1) where shallow flooding escapes the channel and flows south along Beech Avenue. DEA's team has experience working with high tail water systems and storm drain master plans. We have helped multiple cities collaborate with County Flood Control Districts to determine appropriate modeling parameters and assumptions based on expected future regional improvements.</p>

Master Plan of Storm Drain Update

Through DEA's experience with master planning, we have broken down the master plan into three phases, Plan & Prepare, Analyze, and Prioritize & Document. The flow chart below is a visual depiction of an efficient way to customize and move a master plan through to completion. While the City's RFP doesn't have the scope broken down similar to the graphic, all of the elements in the graphic are included in the scope presented in the RFP.



Task 4.1 – Data Collection and Review

Data is the foundation of all master planning, therefore, it is important to understand what data exists and where there are gaps in the data. DEA will create data maps in GIS and export tables showing what data is available spatially, so DEA can advise the City on appropriate methods to fill gaps for each Area of Study (AOS). The investigation will particularly pay attention to facilities constructed since the 1992 MSDP. This task will also include review of the precipitation data for each of the AOS's to determine recommended modeling parameters which will be documented in the detailed memorandum.

Clarifications: The following clarifications/assumptions for the deliverables are included in our fee that are not listed in the RFP:

- City's GIS data will be made available to the consultant.
- City's reports and storm drain plans will be made available to the consultant.
- Data and historical records of known flooding areas or areas of repeat maintenance issues will be provided by the City.
- Hydrology approach for each AOS will be determined individually.
- Land uses will be compared between the 2021 land use plan and the 1992 MSDP in a GIS-based land change map.
- DEA will include a table listing all data collected.
- A detailed memo will be prepared recommending field investigation to verify data gaps.

Task 4.2 Master Plan Report – AOS 1 (Between I-10 and I-210 Freeways)

The area between the I-10 and I-210 Freeways will be modeled by a Full Detailed Hydrology and Hydraulics study using San Bernardino County Hydrology Manual and Coupled 1/2D hydraulic model. Coupled 1 and 2 dimensional (1D and 2D) hydraulic modeling, is recommended for AOS 1 to better understand potential flooding issues associated with the interface of old and new storm drain systems. These models can evaluate locations where surface flows (2D) interact with subsurface (storm drain) facilities (1D). The models allow the runoff to flow from the 2D surface to the 1D storm drain, and can also reverse flow from the 1D storm drain to the 2D surface model. These models are especially helpful in analyzing systems with flat terrain, like the City of Fontana. In comparison to traditional models like WSPG, the coupled 1D and 2D models have shown to provide substantial cost savings related to storm drain infrastructure. The DEA team has seen a savings of up to 50% between traditional model and coupled 1D and 2D modeling.

This approach is recommended for this area because the area contains the mapped floodplains and older infrastructure. The approach requires detailed storm drain data, including as-built inverts in GIS, to import it into the hydraulic model. Hydrology, including detailed hydrographs, will be prepared for each inlet in accordance with San Bernardino County Flood Control Hydrology Manual. Coordination with San Bernardino County Flood Control on committed water surfaces for the downstream control for hydraulic model will be required. The existing and proposed

Master Plan of Storm Drain Update

models for this area will be developed, and Master Plan projects will be recommended based on 1) existing storm drains that are undersized and 2) unconstructed master planned storm drain from the MSDP. Prioritization of the projects will be determined collaboratively with the City and DEA to update the CIP plan. This task includes a prioritization memorandum and workshop with the City.

Clarifications: The following clarifications/assumptions for the deliverables are included in our fee that are not listed in the RFP:

- Only public mainline pipes larger than 18 inches will be included in this analysis
- Catch basins will not be modeled.
- Surface elevation data for this area of the City will be provided by either the City or the county.
- A prioritization memorandum and City workshop is included.

Task 4.3 Master Plan Report – AOS 2 (South of I-10 Freeway)

To focus the City's efforts on the areas which need the most detailed study, the area south of the I-10 freeway has been mostly developed since the 1992 MSDP was completed. The area drains to the DeClez Channel and does not contain any floodplains associated with the channel. Therefore, the study will include higher level hydrology based on the San Bernardino County Hydrology Manual and hydraulic analysis of only backbone pipe sizes larger than 30" on areas tributary to the DeClez Channel. The analysis will focus on making sure that the improvements that have been made since the 1992 MSDP and South Fontana updates are adequate to convey storm flows. The hydrology will contain basin routing for the Sierra Avenue basin as discussed in the South Fontana Update.

Clarifications: The following clarifications/assumptions for the deliverables are included in our fee that are not listed in the RFP:

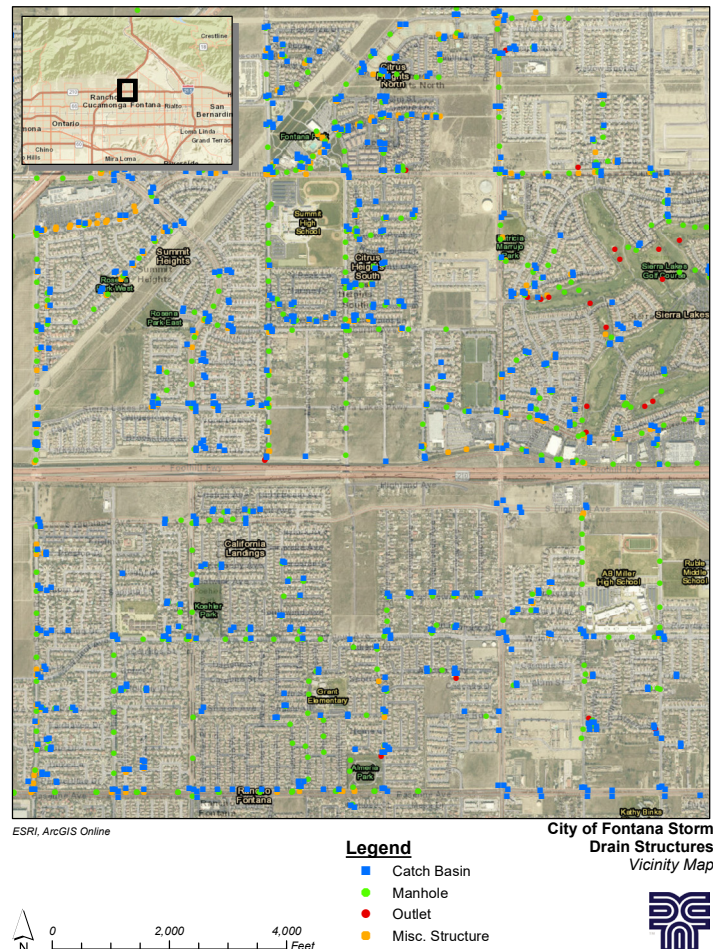
- Only public pipe sizes larger than 30" will be modeled.
- A prioritization Memorandum and City Workshop is included.
- Catch basins will not be modeled.

Task 4.4 Master Plan Exhibit – AOS 3 (North of the I-210 Freeway)

Since the area north of the I-210 Freeway has been more recently constructed and has recent hydrology and hydraulic studies, no new modeling for this area is proposed. Instead, simply reviewing data including the Q3 study, the 1992 MSDP, and as built plans, and including the constructed improvements in the Master Storm Drain Plan and Master Storm Drainage Benefit Areas Map will be part of this task.

Clarifications: The following clarifications/assumptions for the deliverables are included in our fee that are not listed in the RFP:

- As-built plans will be provided by the City.



Task 4.5 Master Plan Report – AOS 3 (North of the I-210 Freeway) (Optional Task)

In addition to the work produced on Task 4.4, a full detailed Hydrology and Hydraulics study will be performed using San Bernardino County Hydrology Manual and SWMM model. Since the Q3 study covers most of this area, the new study would include the Q3 study and the remaining areas into a comprehensive evaluation. Prioritization of the projects will be determined collaboratively with the City and DEA to develop a CIP plan.

Clarifications: The following clarifications/assumptions for the deliverables are included in our fee that are not listed in the RFP:

- Only public mainline pipes larger than 18 inches will be included in this analysis
- Catch Basins will not be modeled.
- A prioritization memorandum and City workshop is included.

Master Plan of Storm Drain Update

Task 4.6 Storm Drain System GIS Update (Optional Task)

Previous tasks will include a review of existing database and gap analysis. However, during this task DEA will review record drawings to incorporate missing storm drain assets in areas not covered by previous tasks and work with The City to standardize data attributes and inputs to help maintain data quality and integrity going forward. In addition DEA will provide metadata as well as a technical memo procedures and attributes included in the database. The database should serve as a master copy of all storm drain assets and will be made available to The City upon completion. In addition to the database, a master basemap and AutoCAD file will be produced from the completed data set.

Clarifications: The following clarifications/assumptions for the deliverables are included in our fee that are not listed in the RFP:

- Database to incorporate all available storm drain assets from existing database, previous tasks, and record drawings available will be prepared.
- Attribute detail may vary depending on source information provided.
- All attributes and fields will be defined in the metadata.
- Overall GIS Basemap and AutoCAD drawing will also be produced.

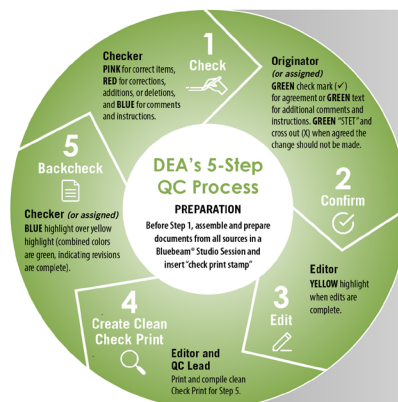
QUALITY CONTROL

DEA's methods and techniques for Quality Control (QC) are employed in all phases of project work to see that the quality requirements are fulfilled for our clients. Quality Assurance (QA) is integral to our culture and processes and is ingrained in each task to be properly implemented. The primary benefit to clients has been the reduction in overall cost of the project by minimizing rework and contractor change orders.

Prior to starting a project, our established QA/QC Manager Gavin Powell, will develop a QA/QC plan based upon the phases of the master plan. Gavin's experience with two of the City's Master Plan Updates, allows him to lay out the critical elements such as the standards and checklists to be followed for each deliverable, the person responsible to provide review of each deliverable, the phases when a quality check needs to be performed, the type of review to be performed (interdisciplinary, accuracy, etc), and where the QC documents need to be stored for auditing. For master planning, quality checks will be completed

- During data gathering especially with GIS database development
- During hydrology analysis prior to commencing hydraulic analysis
- Post hydraulic analysis to verify any anomalies in modeling
- During CIP development and prioritization to verify the City's needs are being met
- Prior to the Draft Report submittal to the City
- Prior to the Final Report submittal to the City

The QA/QC manager's primary role is to verify these procedures are followed through the life of the project. Every year, DEA performs routine audits on projects to ensure our team is following the protocol established for our clients. Furthermore, we establish discipline experts that are independent of the project for objectivity in review.



DEA's internal 5-Step QC Process enhances our services and facilitates communication between disciplines. Our internal quality program is composed of five critical steps, resulting in a substantive and effective process.

Along with DEA's 5-Step QC Process, Bluebeam's® smart digital tools keeps team members connected and projects on track from start to finish.

Master Plan of Storm Drain Update

PROJECT SCHEDULE

The following project schedule represents the work plan for the Storm Drain Master Plan Update. DEA has the staff available to complete the work as scheduled. It is DEA's intent to do what is possible to help meet the project schedule.

The following is an outline of the key project milestones:

City of Fontana Master Plan of Storm Drain Update Project Schedule													
Task & Description	Months												
	Begin Date	End date	2022	2022	2022	2022	2022	2023	2023	2023	2023	2023	2023
			August	September	October	November	December	January	February	March	April	May	June
Notice to Proceed	8/1/2022	8/1/2022	*										
Task 4.1 Data Collection and Review	8/1/2022	9/19/2022											
Task 4.2 Master Plan Report AOS 1	10/17/2022	1/30/2023											
Task 4.3 Master Plan Report AOS 2	1/16/2023	3/20/2023											
Task 4.4 Master Plan Exhibit AOS 3	3/20/2023	4/17/2023											
Task 4.5 Master Plan Report AOS 3 (Optional)	4/17/2023	6/5/2023											
Task 4.6 Storm Drain GIS Update (Optional)	8/1/2022	10/17/2022											
City Final Review	6/5/2023	7/5/2023											
Final Report	7/5/2023	7/31/2023											

FEES

The fees and hours presented below include a rough estimate of the fee to meet the City's needs as presented in the RFP. To simplify the fee, we have not added any tasks to those presented in the RFP. Therefore, costs for management, meetings, and QA/QC is included in each of the tasks.

City of Fontana Master Plan of Storm Drain Update (SQ-87-DE-19-33) Project Fee Schedule												
Task & Description		SR PM \$290	QA/QC \$250	PE \$180	EIT \$140	Intern \$100	SR GIS \$150	GIS \$110	PC \$130	ADMN \$110	Total \$	Reim. \$
REQUIRED TASKS												
4.1	Data Collection and Review	20	4	96	96	8	8	24	0	13	\$ 43,590	
4.2	Master Plan Report - AOS 1	44	37	161	256	40	2	16	0	20	\$ 95,090	
4.3	Master Plan Report - AOS 2	38	27	121	148	32	2	4	0	20	\$ 66,410	
4.4	Master Plan Exhibit - AOS 3	21	9	61	48	0	2	2	0	19	\$ 28,650	
ODC												\$ 2,000
OPTIONAL TASKS												
4.5	Master Plan Report - AOS 3	18	29	76	172	64	2	4	0	8	\$ 58,250	
4.6	Storm Drain System GIS Update	0	0	6	24	240	48	240	0	0	\$ 62,040	
ODC												\$ 1,000
Total Fee (Tasks + ODCs)		141	106	521	744	384	64	290	0	80	\$ 354,030	\$ 3,000
											\$ 357,030	

Legend:

SR PM=Senior Project Manager, PE=Project Engineer, EIT=Unregistered Civil Engineer, QA/QC=Quality Manager, SR GIS=Senior Geographic Information System Analyst, GIS=Geographic Information System Analyst, PC=Project Coordinator, ADMN=Administrative

Please Note: All fees and scope are negotiable.

Master Plan of Storm Drain Update

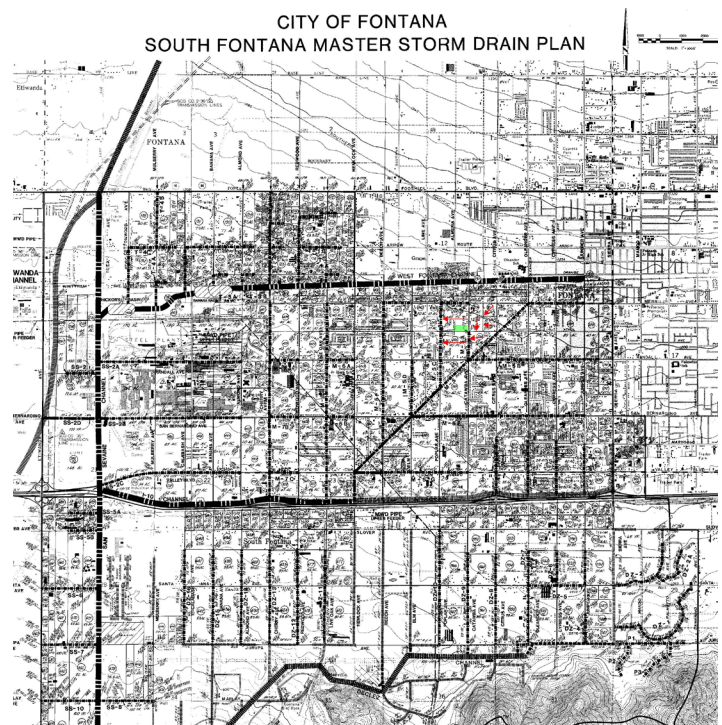
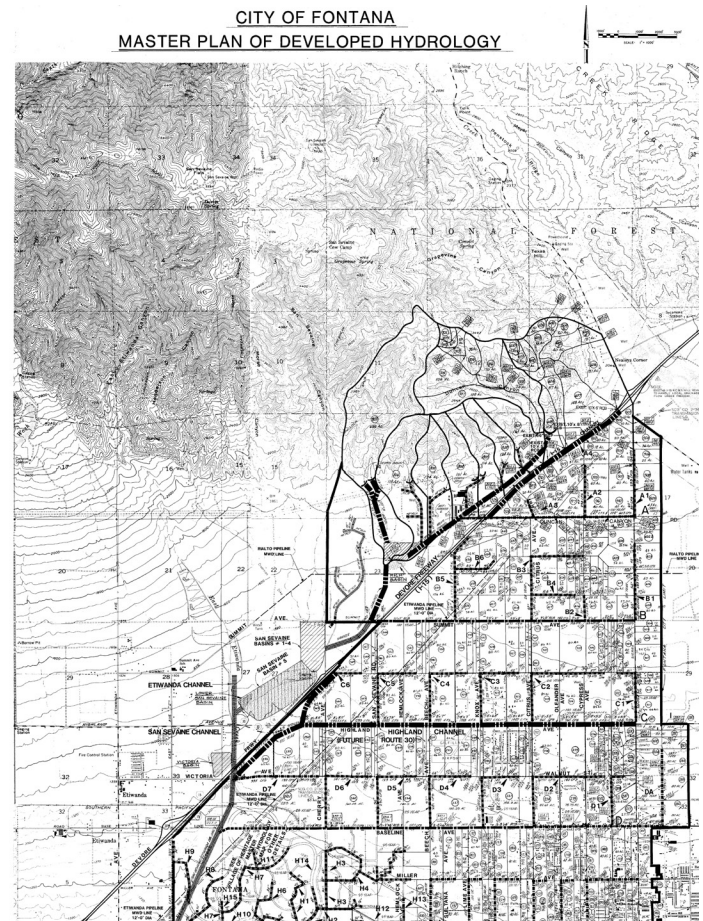
RELEVANT PROJECTS

North Fontana Drainage Master Plan Study, Fontana, California

After preparing the original City's Master Plan of Drainage several years ago, DEA has conducted several supplemental focused drainage studies at the request of the City. DEA was tasked with evaluating the impacts resulting from two separate development projects tributary to the Hawker-Crawford channel. The developments proposed land-uses that were inconsistent with the City's Master Plan of Drainage (MPD), and also were proposing the realignment of the Hawker-Crawford channel. The City determined that as part of the EIR process for those projects, a technical drainage analysis would be necessary to evaluate these proposed changes. DEA was retained to provide that analysis, which included extensive project research and review of prior drainage studies and as-built drawings; a verification of previously studied drainage areas; conducting a peer review of the hydrology studies for the two development projects in question; and performing an alternatives analysis to assess two separate alignment scenarios presented by the City. DEA utilized previously prepared hydrology analysis and conducted an hydraulic analysis to identify drainage improvements necessary for the two alternatives. Recommended improvements for each alternative were presented in a report format which included associated cost of implementation, hydraulic calculations, reference data, maps/exhibits for each alternative, and summary of recommendations and considerations for the City's use in making a determination of preferred alternative. **Relevance: This project was selected as relevant because it included a drainage master plan specific to the City of Fontana.**

South Fontana Master Plan of Drainage - Alternative Analysis for the Sierra Avenue Detention Basin, Fontana, California

DEA was tasked with evaluating the possibility of eliminating, relocating or reducing the size of the existing Sierra Avenue Detention Basin. With its location in a desirable commercial corridor, the City was interested in re-purposing the basin for a more beneficial land-use. Based on hydrology analysis previously performed, DEA performed an analysis and evaluated the various alternatives. It was quickly discovered that elimination of the basin was not viable, so DEA studied the alternatives of a partial reduced footprint, basin relocation, and also a diversion of flow alternative. Recommended improvements for each alternative were presented in a report format which included associated cost of implementation, hydraulic calculations, reference data, maps/exhibits for each alternative, and summary of recommendations and considerations for the City's use in determining a preferred alternative. **Relevance: This project was selected as relevant because it included a drainage master plan and analysis of sub-area alternatives and is specific to the City of Fontana.**



Master Plan of Storm Drain Update

Master Storm Drain Plan Update, Rialto, California

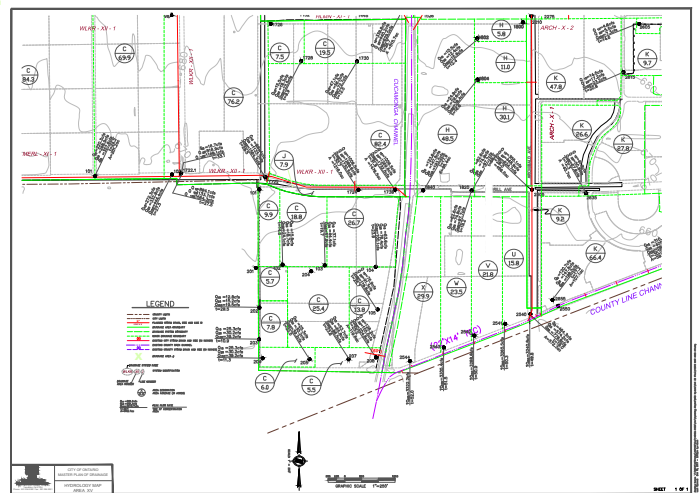
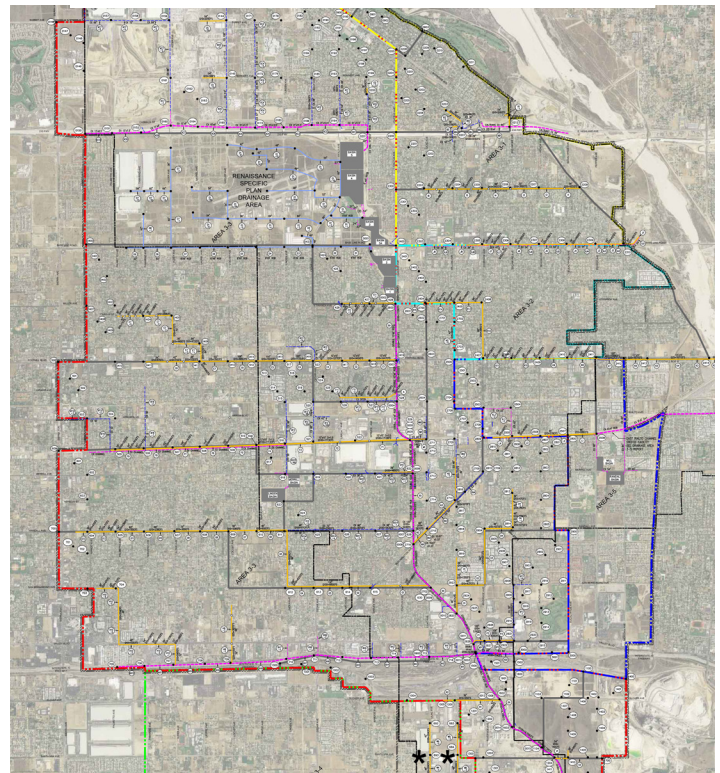
For this update to the City of Rialto's Master Storm Drain Plan, DEA used publicly available topographic data and projected land-use from the City's General Plan before conducting a hydrology analysis for the entire City limits, which included a study area of over 22 square-miles. The analysis included calculations for the 10-year, 25-year, and 100-year storm events. The results of the hydrology analysis were then used to conduct an hydraulic analysis of the City's existing street and storm drain systems. A combined carrying capacity was determined in order to identify where system deficiencies occurred or would occur in the future. This analysis included assessment of open channels, culverts, pipes and transition structures. Once deficiencies were identified, storm drain improvements were recommended and assigned a project identification and priority number. Each project ID included associated pipe size(s), material, length and estimated cost of implementation. The approach, analysis, methodology, conclusions, and recommendations were summarized into a report format that included a narrative description, overall master drainage plan/map(s), hydrology and hydraulic calculations, reference material and cost summary.

Relevance: *This project was selected as relevant because it included a drainage master plan.*

Master Plan of Drainage Update, Ontario, California

This project was an update to the City of Ontario's Master Plan of Drainage (MPD). As a result of significant deviation from the City's MPD driven by several local developments, DEA was tasked with evaluating, modifying and updating the City's MPD to reflect the proposed changes. The deviation consisted of re-aligning two major master planned facilities (WLKR-XII-1 and MERL-XI-1), which consists of storm drain systems ranging from 48-inch RCP to a double 10'x12' RCB. The study area included a total of roughly 4 square-miles spread over multiple drainage areas within the City. DEA provided the engineering services to facilitate the update with scope of services including updates to the report narrative, exhibits, hydrology and hydraulic calculations, cost estimates, summary tables, hydrology maps and appendices. **Relevance:** *This project was selected as relevant because it included a drainage master plan.*

CITY OF RIALTO
MASTER PLAN OF DRAINAGE
DRAINAGE MAINLINE & LATERAL MAP



Master Plan of Storm Drain Update

HOURLY RATES

Rates Effective through December 31, 2022 (rates subject to annual increase)

WATER AND ENVIRONMENT ENGINEERING:

Principal In Charge	\$312.00
Senior Project Manager	\$290.00
Senior Task Manager	\$278.00
QA / QC Manager	\$250.00
Project Manager	\$235.00
Senior Engineer	\$220.00
Project Engineer	\$180.00
Staff Engineer	\$155.00
Designer / EIT / CADD	\$140.00
Senior GIS Analyst	\$150.00
GIS Analyst	\$110.00
Project Coordinator	\$130.00
Administrative	\$110.00

SURVEY (OFFICE):

Survey Manager	\$250.00
Senior Survey Project Manager	\$230.00
Survey Project Manager	\$205.00
Senior Project Surveyor	\$190.00
Project Surveyor	\$170.00
Survey Analyst / Senior Survey Technician	\$160.00
Survey Technician / Survey CADD	\$140.00

FIELD SURVEY:

Per union agreement, there is a 4, 6, and 8-hour minimum charge for survey work. DEA is a signatory to the International Union of Operating Engineers Local 12. Field surveyors are therefore paid prevailing wage rates for all work performed.)

1-Person Survey Crew	\$185.00
2-Person Survey Crew	\$325.00

Master Plan of Storm Drain Update

Rebecca Kinney, PE, CFM | Project Manager

Education

BS, Civil Engineering, 1995, California State Polytechnic University, Pomona

Registration

Professional Civil Engineer, California, #58797, 1999

Certified Floodplain Manager, (19-11256), 2023

Years of Experience

26

BIOGRAPHY

Rebecca has extensive experience in all phases of stormwater management projects including planning, design, and construction. Her recent experience has focused on development of Master Plans of drainage, which focus on storm drainage facility sizing, stormwater NPDES compliance, stream stability, and floodplain management. Her planning experience includes large master planned communities, and municipal planning, as well as supporting hydrologic and stormwater quality analysis as a basis for CEQA documentation. Rebecca has prepared Water Quality Management Plans, Stormwater Pollution Prevention Plans, and CEQA water quality technical studies. She is experienced in channel restoration design work including hydrologic and hydraulic modeling and PS&E work. She has also served as a regulatory agent for the application of 404 Corps of Engineers, 401 California Regional Water Quality Control Board, and 1601/1603 California of Department of Fish and Game permits. Key relevant projects include the Orange County Flood Control Master Plan, Santa Ana Storm Drain Master Plan, Watershed Action Plan for the Santa Ana River Watershed, Rancho Mission Viejo Runoff Management Plan, and the La Entrada Specific Plan Flood Hazard Study.

EXPERIENCE:

Southern California Logistics Airport Drainage and Water Quality Master Plan, Victorville, California

Rebecca was the task manager for the drainage and water quality master plans for the reuse of the former George Air Force Base. The studies included different hydrology and hydraulics methods based on the tributary watersheds. The areas that drained to the east to the Mojave River used traditional modeling and used on site lot detention to minimize required backbone storm drain and to comply with Phase 2 MS4 permits. On the east side drainages used rain on grid integrated hydrology and hydraulics using XP SWMM to size regional flood detention and downstream master plan facilities. Water quality was handled by the individual parcels.

Kaiser-KFMC, Fontana, California

Rebecca was the engineer responsible for stormwater engineering on the Kaiser Fontana campus expansion. The effort included compliance with MS4 permits and updating of the Zone A created by the I-10 channel through a CLOMR and LOMR.

Riverside Groundwater Aquifer Storage and Recovery System, San Bernardino County, California

Rebecca served as the project engineer for the preliminary design and environmental clearance for a rubber dam diversion on the Santa Ana River for the purposes of groundwater recharge. The project includes both in channel and offline recharge basins for replenishment of the Rialto-Colton and Riverside-Arlington Groundwater Basins. A portion of the project includes a tie-in to the state water project line as a method for recharging groundwater when native water is not available. The project also involves the preparation of an EIR for the project.

Yorba Linda Master Plan of Drainage, Yorba Linda, California

Rebecca served as project manager for the update of Yorba Linda's Master Plan of drainage. The master plan was customized to the City's needs, and analyzed each of the watersheds differently based the results of the previous master plan. This allowed the City to spend money on more advanced modeling in a specific area of the City with many CIP storm drain projects, which resulted in a decrease in the amount storm drain replacement.

Orange County Flood Control Master Plan, Orange, County, California

Rebecca served as project manager for the development of a GIS-based ranking tool based on engineering analyses to assist the County in the development and prioritization of their Capital Improvement Projects (CIP). The goal of the project was to create a living decision making and tracking tool for use by the County for CIP planning, and public communication. The process

Master Plan of Storm Drain Update

included rating and ranking approximately 150 potential CIPs. Python scripting was used to automate the evaluation and prioritization processes. A GIS web-based application was developed to either view or edit the prioritization process.

Master Plan of Storm Drainage for North and West Santa Ana River Tributary Areas, Anaheim, California

Rebecca served as the project manager and prepared an updated comprehensive storm drainage master plan for the North and West Santa Ana River tributary areas. The new plan was based on previous studies for the areas, updated to account for current hydrology methods, new hydrology modeling in areas without existing studies, improvements to the storm drain/tributary channel systems, and the latest land use planning.

Rancho Mission Viejo Runoff Master Plans & Drainage Design, Orange County, California

Rebecca served as project manager for the preparation of two Runoff Master Plans, the Ranch and Drainage Facility Design for PA-2 and PA-3, including Cow Camp Road. The runoff management plans are an integrated planning document that employs specialists from traditional and innovative hydrology and hydraulics, advanced sediment transport, GIS, and storm water quality. The plan includes complex hydrology models of the San Juan Creek Watershed, including Gobernadora Canyon, channel hydraulics and sediment transport, water quality and regional flood control basin preliminary design and storm drain master planning.

Santa Ana Storm Drain Master Plan, Santa Ana, California

Rebecca served as project manager for the update to the City's storm drain master plan. The City has an established drainage system with some segments over 50 years old and other segments recently constructed. The project analyzed the main line drainage system and prepared a hydrology study along with maps for the entire city boundary and for individual sub-areas for 2-, 10-, 25-, and 100-year storm events. The capacity of the existing storm drainage was evaluated to determine system capacity sufficiency using a hydrodynamic hydraulic model. A comprehensive list of needed storm drainage improvements using the coupled 1D/2D XP-SWMM hydrodynamic model.

La Entrada Drainage and Hydrology Specific Plan Studies, Coachella, California

Rebecca was the engineer responsible for the stormwater engineering. The project site includes seven regional conveyances and coalescing alluvial fans tributary to the Eastside Dike along the Coachella Canal (Irrigation

Canal). She completed regional hydrology studies for the 50.6 square mile watershed, and 1- and 2-dimensional flood routing analyses to support the technical studies and identified the recommended improvements and project mitigation measures for the project site development. The team identified a whole fan flood hazard management program and developed the alignment and conceptual design for seven regional channels through the site.

San Diego Creek Master Drainage Plan, Orange County, California

Rebecca served as project manager responsible for stormwater engineering and project management to update and extend the San Diego Creek Master Plan hydrology from the confluence with Peters Canyon Wash to the Upper Newport Bay; a total watershed area of 120 square miles. Michael Baker's services included review and update of the watershed maps, rational method analysis, hydrograph parameter development, hydrograph analysis, and preparation of the master plan report. Fee: \$296K

Tujunga Wash Watershed Groundwater Recharge Master Plan, Los Angeles County, California

Rebecca served as project manager responsible for master planning services for the preparation of the Tujunga Wash Watershed Groundwater Recharge Project. The San Fernando Groundwater Basin, which is a significant resource for drinking water for the City of Los Angeles, was in a state of overdraft. In order to meet current and future water demands without utilizing imported water, the County and City were seeking to maximize groundwater recharge in the Tujunga Wash Watershed which overlays the groundwater basin. The first phase of the project involved determination of the feasibility of six existing recharge or storage projects within the Tujunga Wash. The second phase included the development of an overall master plan and the refinement of three new projects, which will be implemented in the next three to five years. All projects investigated economic viability, feasibility of adding telemetry to the sites, environmental constraints, and construction readiness.

Storm Drainage Master Plan, Buena Park, California

Rebecca served as an engineer and provided engineering services to prepare a citywide drainage master plan. Services included field investigations, video surveys, storm drain mapping, hydrodynamic modeling, regulatory compliance analysis, BMP retrofit recommendations, geodatabase update, and master plan report preparation.

Master Plan of Storm Drain Update

Gavin Powell, PE, LEED AP, | Quality Assurance / Quality Control

Education

BS, Civil Engineering, 2000, Oregon State University

Registration

Professional Civil Engineer, California, #67187, 2004

Professional Civil Engineer, Oregon, #63117, 2021

Leadership in Environmental & Energy Design (LEED) New Construction Accredited Professional

Years of Experience

22

BIOGRAPHY

Gavin has 22 years of extensive management and hands-on civil engineering experience serving both the public and private sectors. His experience spans all phases of a project life-cycle including due diligence studies, planning studies, preliminary analysis, and final engineering. Gavin has helped develop several master plan documents for both drainage and sewer facilities. He also manages and provides oversight for a variety of services that include the development of street, trail, sidewalk, parking lot, sewer, water, storm drain, and signing and striping improvement plans. He has proven experience in preparing bid package documents (PS&E) for public agencies, and is well versed in the principles of roadway design, grading, drainage, water quality (MS4) compliance, and ADA compliance. His diverse project background gives Gavin a unique ability to balance the various considerations a project faces. Gavin is responsible for leading computer aided drafting teams and is familiar with AutoCAD, Civil 3D, and a variety of design programs including H2Onet, SewerCAD, FlowMaster, PondPack, Bonadiman Civil Design software, and a variety of other hydrology/hydraulic design softwares. A long tenured employee, Gavin is well versed in DEA's QA/QC procedures and has an excellent understanding of our team's technical capabilities. This ensures that appropriate technical experts are assigned review responsibilities. Combined with his own experience in preparing master plan documents, this makes him an ideal candidate to lead QA/QC efforts for the MSDP update.

EXPERIENCE

North Fontana Drainage Master Plan Study, Fontana, California

After preparing the original City Master Plan of Drainage several years ago, DEA has conducted several supplemental focused drainage studies at the request of the City of Fontana. Gavin was the project manager for several of these supplemental studies, one of which

was the North Fontana Drainage Master Plan Study. DEA was tasked with evaluating the impacts resulting from two separate development projects tributary to the Hawker-Crawford channel. The developments proposed land-uses that were inconsistent with the City's Master Plan of Drainage (MPD) and also were proposing the realignment of the Hawker-Crawford channel. The City determined that as part of the EIR process for those projects, a technical drainage analysis would be necessary to evaluate these proposed changes. DEA was retained to provide that analysis, which included extensive project research and review of prior drainage studies and as-built drawings; a verification of previously studied drainage areas; conducting a peer review of the hydrology studies for the two development projects in question; and performing an alternatives analysis to assess two separate alignment scenarios presented by the City. DEA utilized previously prepared hydrology analysis and conducted a hydraulic analysis to identify drainage improvements necessary for the two alternatives. Recommended improvements for each alternative were presented in a report format which included associated cost of implementation, hydraulic calculations, reference data, maps/exhibits for each alternative, and summary of recommendations and considerations for the City's use in determining of preferred alternative.

South Fontana Master Plan of Drainage - Alternative Analysis for the Sierra Avenue Detention Basin, Fontana, California

Gavin was the project manager for the South Fontana Master Plan of Drainage - Alternative Analysis for the Sierra Avenue Detention Basin. DEA was tasked with evaluating the possibility of eliminating, relocating or reducing the size of the existing Sierra Avenue Detention Basin. With its location in a desirable commercial corridor, the City was interested in re-purposing the basin for a more beneficial land-use. Based on hydrology analysis previously performed, DEA performed an

Master Plan of Storm Drain Update

analysis and evaluated the various alternatives. It was quickly discovered that elimination of the basin was not viable, so DEA studied the alternatives of a partial reduced footprint, basin relocation, and also a diversion of flow alternative. Recommended improvements for each alternative were presented in a report format which included associated cost of implementation, hydraulic calculations, reference data, maps/exhibits for each alternative, and summary of recommendations and considerations for the City's use in making a determination of preferred alternative.

Master Plan of Drainage Update, Ontario, California

Gavin served as the project manager for this update to the City of Ontario's Master Plan of Drainage (MPD). As a result of significant deviation from the City's MPD driven by several local developments, DEA was tasked with evaluating, modifying and updating the City's MPD to reflect the proposed changes. The deviation consisted of re-aligning two major master planned facilities (WLKR-XII-1 and MERL-XI-1), which consists of storm drain systems ranging from 48-inch RCP to a double 10'x12' RCB. The study area included a total of roughly 4 square-miles spread over multiple drainage areas within the City. DEA provided the engineering services to facilitate the update with scope of services including updates to the report narrative, exhibits, hydrology and hydraulic calculations, cost estimates, summary tables, hydrology maps and appendices.

Master Storm Drain Plan Update, Rialto, California

Gavin served as the project manager for DEA when completing the Master Storm Drain Plan update for the City of Rialto. Using publicly available topographic data and projected land-use from the City's General Plan, DEA conducted a hydrology analysis for the entire City limits, which included a study area of over 22 square-miles. The analysis included calculations for the 10-yr, 25-yr and 100-yr storm events. The results of the hydrology analysis were then used to conduct a hydraulic analysis of the City's existing street and storm drain systems. A combined carrying capacity was determined in order to identify where system deficiencies occurred or would occur in the future. This analysis included assessment of open channels, culverts, pipes and transition structures. Once deficiencies were identified, storm drain improvements were recommended and assigned a project identification and priority number. Each project ID included associated pipe size(s), material, length and estimated cost of implementation. The approach, analysis, methodology, conclusions, and recommendations were summarized into a report

format that included a narrative description, overall master drainage plan/map(s), hydrology and hydraulic calculations, reference material and cost summary.

Old Town Front Street Drainage Rehabilitation, Temecula, California

Gavin was the project manager for this project to resolve an undesirable drainage condition along Old Town Front Street in the City of Temecula. The project replaced a concrete cross-gutter in Old Town Front Street with multiple inlets and a below ground storm drain system. DEA prepared comprehensive bid documents which included plans, specifications, and cost estimates the City used in bidding the project. While spanning less than 300-feet, the below ground storm drain system crossed numerous existing utilities including an 8-inch Eastern Municipal Water District (EMWD) sewer, 6-inch and 10-inch EMWD forcemains, a 20-inch Rancho California Water District water line, a 30-inch Metropolitan Water District (MWD) blow-off discharge line, telecommunications, and gas lines. In addition, the system ran within an MWD easement, and between MWD San Diego Pipeline 4 (97-inch) and 5 (99-inch). To avoid relocation of, or conflicts with, any existing utilities, a dual/parallel pipe system was specified allowing for smaller diameter pipes to be used. Due to the proximity to the MWD San Diego Pipeline 4 and 5, fusion welded High-Density Polyethylene (HDPE) pipe was specified to achieve a watertight joint. The drainage system incorporated a "bubbler" to allow for discharge without impacting nearby environmentally sensitive areas. A pump system with float switch was utilized to discharge trapped water within the pipe system.

Master Plan of Storm Drain Update

David A. Jaffe, PhD, PE, DWRE | Hydraulics and Hydrology Modeling

Education

PhD, Civil and Environmental Engineering, 2002, University of California, Irvine

MS, Civil and Environmental Engineering, 2002, University of California, Irvine

MS, Physical Marine Science, 1998, University of Southern Mississippi

BA, Earth and Planetary Sciences, 1994, Johns Hopkins University

Registration

Professional Engineer, California, 68321, 2005

Professional Engineer, Arizona, 44318, 2006

Registered Disaster Service Worker, California, SAP62634, 2006

Diplomate, Water Resources Engineer, 563, 2010

Qualified SWPPP Developer (QSD), California, C68321, 2014

Professional Engineer, Idaho, 20741, 2021

Professional Engineer, Washington, 21016896, 2021

Certificate, Fish Passage and Stream Restoration Design, Washington, FPT20-30855, 2021

Years of Experience

21

BIOGRAPHY

David has worked for more than a decade at the intersection of water resource development, water infrastructure design, and water policy. David has focused his technical expertise on the translation of engineering science into actionable environmental benefit. His scope has been varied both domestically and internationally. David's long-term goals embrace the application of water resource management and development to enable positive social change.

EXPERIENCE:

La Colina Sediment Basins, City of Glendora, Los Angeles County, California

Dr. Jaffe is leading the constructability review of several features of the La Colina project associated with TTN 66608 & 66609. Our review has found that the original design by others (10/28/13) oversized the basins. The basin design was based on 100% yield of sediment from the tributary watersheds to the basins following LACDPW criteria as described in the 2006 Hydrology and Sedimentation manuals. The subsequent sediment transport modeling study by others, which also followed LACDPW criteria, illustrates the fate of sediments using a numerical model. Based on our review it appears that the following occurred: 1) the original design of the basins was intended to be a conservative planning level effort; 2) the later analysis of the sediment yield to the

project was intended to revise the basin sizing based on a more detailed analysis than was present in the original study. Dr. Jaffe is leading the redesign of the basins based on the original conditions of approval and the latter modeling effort. Since the modeling effort indicates that not all the sediment yielded from the watershed reaches the project site the basin design is reduced by approximately 75% of the preliminary design.

Planning Level Technical Study Cahuilla Band of Indians Roadway Culvert Improvements, Riverside County, California

Dr. Jaffe is leading the technical study of the hydraulic deficiency and flooding associated with the Section 404 funded project. The project has been contracted to the Cahuilla Band of Indians to perform a hydrology and hydraulics planning level technical study within the Cahuilla Tribal lands. Overall, the Tribal Council is seeking to evaluate the hydraulic conveyance of select roadways and culvert locations from 18 roadways and approximately 50 roadway culvert crossings and identify areas that would benefit from improvements to reduce local flooding. In February 2019, approximately 21 roadways and culvert locations within the Cahuilla Band of Indians reservation were subject to damage from severe storms, flooding, landslides, and mudslides (DDR4423DR). The Tribe will be receiving funds from FEMA to mitigate these damages for tribal roads

Master Plan of Storm Drain Update

and culvert locations under Section 404 Hazard Mitigation Grants. Select BIA roadways and culvert location will receive emergency relief funding through a separate FHWA grant. Details of the damaged areas are summarized in FEMA Disaster #4423DR Damage Descriptions and Dimensions, dated 9.30.19). The Tribe subsequently is planning to complete the projects with a Construction Manager/General Contractor (CMGC) delivery method. Prior to completion of drainage and roadways improvements, the Tribe is requesting the services of the project team to complete a hydrology and hydraulics evaluation study for the Tribal roadways and culvert locations and BIA roadways and culvert locations. Analysis was completed with rain-on-grid two-dimensional numerical modeling of the tributary watershed. Existing and draft proposed conditions are studied at the planning level appropriate for Section 404 projects.

Avenue 50 Extension, Coachella, California

The project provided design services for a project to connect existing Avenue 50 at Fillmore Road to the proposed Avenue 50 Interchange on Interstate 10. Once connected to the I-10 interchange, this stretch of Avenue 50 will provide essential access and regional circulation to the City of Coachella from the East. Additionally, the Avenue 50 project will facilitate the necessary infrastructure, including utilities corridors, for the La Entrada Specific Plan. The project includes the design of approximately 7,200 linear feet of six-lane arterial roadway with NEV and bike lanes. Dr. Jaffe served as the technical lead and lead modeler (hydrology, 2D hydraulics, and bridge and hydraulic structures).

Interstate 10/Avenue 50 Interchange, Coachella, California

The project prepared a study and report and provided state and federal environmental documentation for the I-10/Avenue 50 Interchange Project. The purpose of the project is to relieve forecasted congestion on I-10 and S.R. 86, including the Dillon Road interchanges. The interchange improvements will provide a new gateway into the city and improve access to I-10 for vehicles traveling in and out of the city. The project team prepared the project report; new connection report; environmental documentation; geometric approval drawings; design exceptions fact sheets; and plans, specifications, and estimates (PS&E). Dr. Jaffe served as the technical lead and lead hydraulic modeler.

Belmont Creek Flood Management Plan, San Mateo County, California

The project is developing a comprehensive Flood Management Plan for the Belmont Creek watershed from Twin Pines Park to Industrial Road. The Flood Management Plan will screen, combine, and prioritize alternatives for hydraulic modeling that include green infrastructure and stormwater capture. The Flood Management Plan will establish implementable and community supported flood risk reduction measures. The implementation plan incorporates preliminary designs of alternatives, scheduling, cost estimates, and high-level summary of regulatory requirements, considering environmental constraints that might impact or potentially cause lengthy delays for environmental permitting. The project will also identify a funding strategy that describes the source and schedule for implementing these alternatives. Dr. Jaffe served as the technical lead and lead modeler (2D hydraulics).

Alluvial Fan Hydraulic and Sediment Analysis, Inyo County, California

Led watershed sediment yield, fan yield, and two-dimensional hydraulic analysis of an alluvial fan in eastern, central California. The purpose of the study was to determine the extent of sediment delivery to the fan toe, both historically and during the design event. The project driver was the inundation of road and highway bridge by sediment during sub-design level events at the toe of the fan. Analyses included multiple steps and combined methods to deal with a broad variety of uncertainty, both in available data and in analytic procedures. Two methods of watershed sediment yield (MUSLE and ACOE[Tatum]) were combined to determine a range of yield values for long-term and single event discharges. The historical discharges were developed for the fan apex using both gage and NOAA atlas data sets, including corrections for snow melt and monsoonal events. Two-dimensional modeling was conducted of the fan surface, and to resolve questions of fan feeder channel avulsion, a series of additional analyses were conducted. These analyses included geomorphic (Lancaster et al. 2012), statistical hydraulics (French et al. 1996), and empirical hydraulics (Leopold & Wolman 1957; Dowdy 1979). Sediment transport analyses of fan channels were conducted using SAM and HEC-RAS.

Master Plan of Storm Drain Update

Rianne Okamoto, EIT | Hydrology and Hydraulics Modeling

Education

BS, Civil Engineering, 2018, California State Polytechnic University

Registration

Engineer-In-Training, CA #162501, 2017

Professional Civil Engineer, OR#100192PE, 2022

Years of Experience

6

BIOGRAPHY

Rianne Okamoto serves as an engineer-in-training who has experience in surface water management. She has extensive knowledge of local and regional hydrologic methodologies and analysis. Her experience comes from developing runoff management plans which include hydrology, hydraulics, sediment transport and report preparation. Her computer modeling skills include the application of HEC-RAS (River Analysis System), Advanced Engineering Software (AES) for hydrologic analysis in Southern California, Bentley PondPack for complex basin modeling and HEC-6T for sediment transport models.

EXPERIENCE

Rancho Mission Viejo Runoff Management Plans, Orange County, California

Rianne was responsible for hydrology, hydraulic modeling and, flood analysis for Planning Areas 3 & 4. The program includes complex hydrology models of the San Juan Creek Watershed and Gobernadora Canyon, channel hydraulics, sediment transport, water quality and regional flood control basin preliminary design and storm drain master planning. The PA ROMPs are comprehensive watershed planning documents that fulfill both the Ranch Plan Environmental Impact Report (EIR) requirements and current Water Quality NPDES requirements. The program includes integration of flood control, water quality, and stream stability for Chiquita Canyon, Gobernadora Canyon, and San Juan Creek.

Yorba Linda Master Plan of Drainage, Yorba Linda, California

Rianne was responsible for QA/QC for the hydrology map and calculations. The project intent was to provide drainage planning management for the City. The hydrology and hydraulics modeling was completed using GIS and XPSWMM.

Dominguez Channel Watershed Study, Los Angeles County, California

Rianne was responsible for data collection and compilation of the GIS data. The purpose of the study is to evaluate the hydraulic capacity of the existing levees along the channel and to identify deficiencies in the Federal Emergency Management Agency (FEMA) requirements. The watershed study included collection of data using as-built drawings and field reconnaissance, updating drainage information using GIS, performing hydrology and hydraulic analysis and developing a technical report and presentation.

Hesperia A-04 Storm Drain Hydrology and Preliminary Basin Design, San Bernardino, California

Rianne was responsible for hydrology and preliminary basin design. Provided preliminary basin design after determining the constraints for the downstream outlet, storage capacity and non-jurisdictional status. The basin consisted of an approximately 80 ac-ft foot basin meant to provide local and regional retention for the City of Hesperia.

Osage Dam Breach and Inundation Mapping, Multiple Counties, Missouri

Rianne was responsible for a 2D HEC-RAS dam inundation analysis and inundation mapping. Provided engineering services to update the dam breach analysis, prepare new inundation maps, and provide digital format inundation limits.

Lower Peters Canyon Basin Analysis, Orange County, California

Rianne was responsible for hydrology, basin analysis, documentation of the analysis. The intent of the study was to determine current storage capacity and freeboard as it relates to Division of Safety of Dams criteria. The current basin varies from the original basin design due to growth of vegetation and sediment deposition. Various alternative methods were assessed to determine the current capacity of the basin.

Master Plan of Storm Drain Update

Michael Becerra, EIT | Engineering Designer

Education

BS, Civil Engineering, Cal State Long Beach, 2014

Registration

Engineer-in-Training, 2/6/2014, California, 151952

Years of Experience

8

BIOGRAPHY

Michael Becerra is a staff engineer at DEA with experience, specializing in the design and modeling of complex storm water drainage systems, hydrology, and water quality. He has experience in the production of design drawings, which include storm drain, sewer, water and site grading. Michael has a working knowledge in site design grading.

EXPERIENCE

North Fontana Drainage Master Plan Study, Fontana, California

After preparing the original City's Master Plan of Drainage several years ago, DEA has conducted several supplemental focused drainage studies at the request of the City of Fontana. DEA was tasked with evaluating the impacts resulting from two separate development projects tributary to the Hawker-Crawford channel. The developments proposed land-uses that were inconsistent with the City's Master Plan of Drainage (MPD), and also were proposing the realignment of the Hawker-Crawford channel. The City determined that as part of the EIR process for those projects, a technical drainage analysis would be necessary to evaluate these proposed changes. DEA was retained to provide that analysis, which included extensive project research and review of prior drainage studies and as-built drawings; a verification of previously studied drainage areas; conducting a peer review of the hydrology studies for the two development projects in question; and performing an alternatives analysis to assess two separate alignment scenarios presented by the City. DEA utilized previously prepared hydrology analysis and conducted an hydraulic analysis to identify drainage improvements necessary for the two alternatives. Recommended improvements for each alternative were presented in a report format which included associated cost of implementation, hydraulic calculations, reference data, maps/exhibits for each alternative, and summary of recommendations and considerations for the City's use in making a determination of preferred alternative. Michael performed hydrology and hydraulic calculations that supported the

MPD revision. Additionally, Michael produced exhibits that supported the design alternatives for the proposed channel.

South Fontana Master Plan of Drainage - Alternative Analysis for the Sierra Avenue Detention Basin, Fontana, California

After preparing the original City's Master Plan of Drainage several years ago, DEA has conducted several supplemental focused drainage studies at the request of the City of Fontana. DEA was tasked with evaluating the possibility of eliminating, relocating or reducing the size of the existing Sierra Avenue Detention Basin. With its location in a desirable commercial corridor, the City was interested in re-purposing the basin for a more beneficial land-use. Based on hydrology analysis previously performed, DEA performed an analysis and evaluated the various alternatives. It was quickly discovered that elimination of the basin was not viable, so DEA studied the alternatives of a partial reduced footprint, basin relocation, and also a diversion of flow alternative. Recommended improvements for each alternative were presented in a report format which included associated cost of implementation, hydraulic calculations, reference data, maps/exhibits for each alternative, and summary of recommendations and considerations for the City's use in determining a preferred alternative.

Master Plan of Drainage Update, Rialto, California

For this update to the City of Rialto's Master Storm Drain Plan, DEA used publicly available topographic data and projected land-use from the City's General Plan before conducting a hydrology analysis for the entire City limits, which included a study area of over 22 square-miles. The analysis included calculations for the 10-year, 25-year, and 100-year storm events. The results of the hydrology analysis were then used to conduct a hydraulic analysis of the City's existing street and storm drain systems. A combined carrying capacity was determined in order to identify where system deficiencies occurred or would occur in the future. This analysis included assessment of open

Master Plan of Storm Drain Update

channels, culverts, pipes and transition structures. Once deficiencies were identified, storm drain improvements were recommended and assigned a project identification and priority number. Each project ID included associated pipe size(s), material, length and estimated cost of implementation. The approach, analysis, methodology, conclusions, and recommendations were summarized into a report format that included a narrative description, overall master drainage plan/map(s), hydrology and hydraulic calculations, reference material and cost summary. Michael performed the hydraulic calculations that supported the MPD revision. Additionally, Michael produced relevant exhibits that supported the storm drain facilities locations and sizing.

Master Plan of Drainage Update, Ontario, California

This project was an update to the City of Ontario's Master Plan of Drainage (MPD). As a result of significant deviation from the City's MPD driven by several local developments, DEA was tasked with evaluating, modifying and updating the City's MPD to reflect the proposed changes. The deviation consisted of re-aligning two major master planned facilities (WLKR-XII-1 and MERL-XI-1), which consists of storm drain systems ranging from 48-inch RCP to a double 10'x12' RCB. The study area included a total of roughly 4 square-miles spread over multiple drainage areas within the City. DEA provided the engineering services to facilitate the update with scope of services including updates to the report narrative, exhibits, hydrology and hydraulic calculations, cost estimates, summary tables, hydrology maps and appendices. Michael provided the updates, which included hydrologic, hydraulic and cost estimate calculations. Michael also provided revisions to the MPD exhibits.

I-15 Logistics Center, Fontana, California

Michael served as staff engineer for the plan production and storm drain design on this logistics center project. Caprock Partners has chosen DEA to provide civil engineering, survey, mapping, and traffic services for their 1,175,720 square foot "high-cube" logistic warehouse located on approximately 76 acres. The Logistic Site is part of an annexation of 149 acres located in unincorporated San Bernardino County to the City of Fontana, subsequent to the approval of the EIR. This project is located at the base of the lower slopes of the San Gabriel Mountains, which will be receiving bulk offsite flows of 820 CFS during a 100 year storm that will be captured and by-passed through the project site. The project scope also includes the realignment of 4,400 linear feet of Lytle Creek Road, from the westerly project

edge of the Logistic Site to a new intersection with Sierra Avenue, along with the design of an onsite sewer lift station, which will tie into the gravity sewer system in Sierra Avenue. The current sewer main in Sierra Avenue north of I-15 is dry, so DEA will be designing roughly 1000' of sewer in Sierra Avenue to connect to an active sewer line south of the project site. This will be the third industrial project that DEA works on for Caprock Partners.

Master Plan of Storm Drain Update

Nick Zamarripa, PE | MPD Documentation and CIP

Education

BS, Civil Engineering, Loyola Marymount University, 2012

MS, Civil Engineering: Emphasis in Water Resources, Loyola Marymount University, 2014

Registration

Professional Civil Engineer, 12/15/2016, California, 86476

Years of Experience

8

BIOGRAPHY

Nick has over eight years of experience working on public improvement and private development projects in Southern California. He has worked on small and large storm drain master plans as well as designing backbone systems for master planned communities. Nick has extensive knowledge in hydrologic and hydraulic modeling for agencies in the region including complex 1-dimensional and 2-dimensional modeling in HEC-RAS and SWMM. He has a strong background in storm drain, channel, and levee design including final preparation of construction bid packages (PS&E). His project experience has led him to work with regulatory agencies such as FEMA, the US Army Corps of Engineers, and California Department of Fish and Wildlife, balancing environmental impacts of designs with cost feasible solutions.

EXPERIENCE

Master Plan of Storm Drainage for North and West Santa Ana River Tributary Areas, Anaheim, California

Served as an engineer preparing an updated comprehensive storm drainage master plan for the North and West Santa Ana River tributary areas. The new plan was based on previous studies for areas, updated to account for current hydrology methods, new hydrology modeling in areas without existing studies, improvements to the storm drain/tributary channel systems, and the latest land use planning. Performed watershed delineation, hydrology calculations, and storm drain capacity analyses for areas without existing data. Additional tasks included updating the City's GIS storm drain database with current data and preparing a networked XPSWMM model for areas of special focus.

Los Peñasquitos Watershed Drainage Master Plan, San Diego, California

Served as an engineer preparing an updated comprehensive storm drain master plan for the Los Peñasquitos Watershed. The new plan included the creation of a hydrodynamic 1D/2D PC-SWMM model

for analysis of the existing and proposed drainage improvements. The update used data from as-built plans, HEC-RAS models, and data gathered in the field to fill gaps in information. Hydrology, hydraulic, and basin routing calculations were all completed within the complex model and georeferenced for City use in their GIS database. A full report, maps, and training of City staff on using the PC-SWMM program to maintain the data completed the project. Nick participated in all aspects of the project from data entry, to hydrology and hydraulic calculations, to being one of the on-site resources to City staff during their PC-SWMM training.

Avenue 50 Extension – La Entrada Development, Coachella, California

Served as a project engineer providing design services for a roadway extension project to connect the existing Avenue 50 at Fillmore Road to the proposed Avenue 50 Interchange on Interstate 10. Once connected to the I-10 Interchange, this stretch of roadway will provide essential access and regional circulation to the City of Coachella from the East. Additionally, the project will facilitate the necessary infrastructure, including utilities corridors, for the La Entrada Specific Plan. Responsible for designing the backbone storm drain system to serve the interim and ultimate conditions of the western portion of La Entrada site.

Santa Ana Storm Drain Master Plan, Santa Ana, California

Served as an engineer for the update to the City's storm drain master plan. The City has an established drainage system with some segments over 50 years old and other segments recently constructed. The project analyzed the main line drainage systems and prepared a hydrology study along with maps for the entire city boundary and for individual sub-areas for 2-, 10-, 25-, and 100-year storm events. Nick worked to create and update a coupled 1D/2D XP-SWMM hydrodynamic model and provided QA/QC of the model inputs based on as-built data.

Master Plan of Storm Drain Update

Melissa M. Foltz | GIS Analyst

Education

BS, Horticulture Science/Landscape Design, 2000, Montana State University

Software Proficiencies

Microsoft Word, Works, Excel, PowerPoint, Outlook, Adobe Photoshop, Illustrator, InDesign, Acrobat, WordPress, AutoCAD, and ArcGIS

Years of Experience

22

BIOGRAPHY

Melissa is a graphic specialist/GIS analyst with 22 years of experience. Since joining DEA, she has had experience working with projects in energy, environmental, planning, and transportation. She has utilized multiple software platforms (AutoCAD, ArcGIS, Adobe, etc.) to create, edit, analyze, and display data to produce easy to read graphics for both informational and presentation needs. This includes graphs, flow-charts, schedules, report graphics, report layouts, meeting presentations, public involvement displays, and project websites.

EXPERIENCE

Lebanon Storm Drainage Master Plan and West Side Sanitary Sewer Interceptor, Lebanon, Oregon

DEA recently updated the City of Lebanon (population 17,000) 1989 Storm Drainage Master Plan (required due to continued community growth and development). This project included planning-level review and analysis of the city's existing stormwater system capacity to identify potential capacity deficiencies and system enhancements that would improve capacity of the existing system. DEA also analyzed the city's future stormwater system needs, based on projected growth and development, and identified potential capacity deficiencies (given proposed, future development scenarios), and identified system improvement alternatives that would improve capacity under future development scenarios. In addition, this project developed a stormwater CIP plan for the City, with a prioritized list of projects that address stormwater system deficiencies (existing and future)—including a timeline to complete projects, planning-level project costs, and an analysis of funding mechanisms and utility rates for recommended stormwater projects. The project is nearly complete, with final completion on schedule for July 2022. Throughout this project Melissa worked with water resource engineers to provide report graphics to be included in the final deliverable.

Roadway Capital Improvement Plan (RCIP) Update, Multnomah County, Oregon

On behalf of Multnomah County, DEA was responsible for assisting in the update of the County's five-year Capital Improvement Plan in an effort to identify projects to include in the five-year horizon, a methodology for transparently selecting projects in an equitable way, and an easy-to-use scoring and evaluation process that is flexible and adaptable to respond to County needs over time. As part of the initial data collection process, DEA met with the County to define the roadways and time periods to collect the mobile LiDAR data. Data was collected using this method on most of the County roads and supplemented by conventional methods. With the critical data defined, DEA met again with the County to help define the features and attributes to be extracted and then mapped in GIS. DEA extracted the critical elements of the LiDAR data and processed it into a geocoded electronic format that was used in mapping in a GIS platform. Due to the size of the project, it was broken into three phases. This allowed decisions at appropriate times to save on scoping and budget to feed later phases. An example of this was that critical data collected during the project was determined during Phase 1 and then scoped for Phase 2. This process allowed the County to have value-added input on what data to collect, which ultimately helps the County's data and GIS department to build a dataset that can be used for years to come. Melissa served as a GIS Analyst/Graphic Specialist in Phase III of the RCIP Update for Multnomah County, summarizing overall datasets and producing an atlas to communicate Multnomah County's RCIP Update to the public.

Master Plan of Storm Drain Update

Sara T. Gilbert, GISP | GIS Manager

Education

MS, Earth Sciences (GIS), 1996, Montana State University

BS, Geography, 1993, McGill University (Montreal)

Certification

Geographic Information Systems Professional (GISP), 2012

Years of Experience

25

BIOGRAPHY

Sara is a GIS project manager with 25 years of professional experience supporting environmental, land use, census, engineering, and transportation projects. She utilizes ESRI ArcGIS software for geodatabase design, modeling, spatial data analysis, CAD data integration, LiDAR data manipulation, and mapping. Her experience supporting a wide variety of projects, including EISs and EAs, site suitability indices, wetland and critical habitat delineations, and risk assessments, enables her to provide efficient, effective data management and project support. She is consistently recognized internally and by clients for providing quality detailed maps, statistical analyses, and useful geospatial data.

EXPERIENCE:

Alderwood Tap 115kV Transmission Project, Oregon

To mitigate wildfire risks and increase system resiliency, DEA is designing a new 4.1 mile 115 kV transmission line with distribution underbuild, switches, and associated substation improvements for Blachy-Lane Electric Cooperative (BLEC) from its Alderwood Substation to the intersection of Lawrence Road and Territorial Highway near Eugene, Oregon. BLEC is seeking a FEMA Building Resilient Infrastructure and Communities (BRIC) grant to support project funding. The DEA Team is providing comprehensive grant management, stakeholder engagement, Benefit-Cost Analysis, survey, environmental, geotechnical, and engineering services through design and construction phases, including coordination with local, state, and federal agencies regarding the BRIC application process and compliance.

West Side Sanitary Sewer Interceptor Analysis, Lebanon, Oregon

DEA is providing planning and engineering analysis for the City of Lebanon (population 17,000) West Side Sanitary Sewer Interceptor. DEA is reviewing the existing sanitary sewer system capacity and identifying potential capacity, deficiencies and recommended

system alternatives that would improve capacity of the existing system and will accommodate proposed future development scenarios. Sara is the GIS task lead responsible for the incorporation of as-built record data and translation of sanitary sewer GIS data into an XP-SWMM hydraulic model. She also is responsible for the generation of anticipated sanitary sewer flows (from land use data).

Willamette Water Supply Program Preliminary Design and Permitting, Hillsboro, Oregon

TVWD, the City of Hillsboro, and other municipalities are collaborating to develop the mid-Willamette River at Wilsonville as the next water supply source for their communities. The Willamette Water Supply Program includes an expansion of the existing water treatment plant and the construction of approximately 30 miles of pipeline and treated water storage tanks. As part of the preliminary design phase of the program, DEA prepared a strategy to permit the program. DEA is now working with TVWD, the City of Hillsboro, and the program's staff to implement the permitting strategy and obtain natural resource and land use permits to support construction. Sara serves as the task lead responsible for GIS data development and mapping in support of wetland delineations, wetland permitting, and mitigation planning efforts.

Hills Creek-Lookout Point Transmission Line, , Oregon

BPA acquired a partial transmission line system from Lane County Electric Coop, in the 1950s. This project runs approximately 26 miles from Hills Creek Reservoir, just west of Oakridge, Oregon to the Lookout Point Dam near Lowell, Oregon. In 2013, BPA requested the services of DEA to provide field surveying, mapping, and legal descriptions for approximately 160 access road acquisition documents, and public road approach and crossing permit documents, all in support of the rebuild design for this line. DEA prepared acquisition documents for: US Forest Service (Willamette National Forest), US Army Corps of Engineers, Union Pacific Railway, various

Master Plan of Storm Drain Update

private lands, and timberland companies. DEA also produced Hybrid plan and profile maps and updated them with the rebuild design and new acquisition mapping, for the first 5 miles, and produced brand new plan and profile maps for 19 miles, due to the inaccuracies of the record information that BPA had received from Lane County Electric when it acquired the existing line. Sara served as a GIS analyst on this project.

South Cooper Mountain Concept Plan, Beaverton, Oregon

DEA provided the natural resources and infrastructure analysis and planning elements for the multi-discipline team charged with creating an integrated concept plan for three areas that were added to the Portland Metro Urban Growth Area. Sara worked with the team to develop water, wastewater collection, and stormwater GIS data that could be integrated with the service providers existing datasets. The Concept Plan was the first step to laying out the new growth that occurred following Oregon's land use requirements. DEA was responsible for coordinating with the consulting team as well as with the service providers, including the City of Beaverton, Clean Water Services, Tualatin Valley Water District, City of Hillsboro, and Washington County, on the topics of provision of drinking water, wastewater collection, and stormwater quality and quantity management. The plan also coordinated with initial siting of the 20- to 40-MG water storage facility for the TVWD Willamette Supply System. In addition, the firm was responsible for planning the stormwater elements of the Concept Plan.

Oregon Passenger Rail EIS Project, for ODOT, Oregon

The federally designated Pacific Northwest High Speed Intercity Passenger Rail Corridor (PNWRC) has been the subject of high-speed passenger rail planning and implementation strategies for more than 30 years. The corridor serves the most densely populated regions of British Columbia, Washington, and Oregon, linking Vancouver, B.C.; Seattle; Portland and Eugene, Oregon, with growing intermediate communities, including the capital cities of Oregon and Washington. Under this project, ODOT is in the process of preparing the Corridor Investment Plan (CIP) for the Oregon Segment from Eugene to the Oregon/Washington border. As the GIS project manager, Sara and her team developed natural resource and socioeconomic datasets for this 466-mile corridor to analyze the potential impacts of the various routes. Posters, maps, and an ArcGIS Online website were created to support public meetings.

Upper Klamath Basin Water Management and Drought Contingency Planning, Klamath Tribes, Oregon

As GIS project manager, Sara created a geodatabase to house and integrate hydrologic, irrigation, vegetation, and terrain data received from multiple sources. Three tools were developed using ArcGIS model-builder to rank lands by potential for conversion to upland grazing, pasture renovation of bottomlands and uplands, riparian pasture establishment, and juniper management. The deliverables for this project included acreage estimates, GIS thematic layers, and maps created in support of the hydrological, water use and allocation, and land management technical reports.