




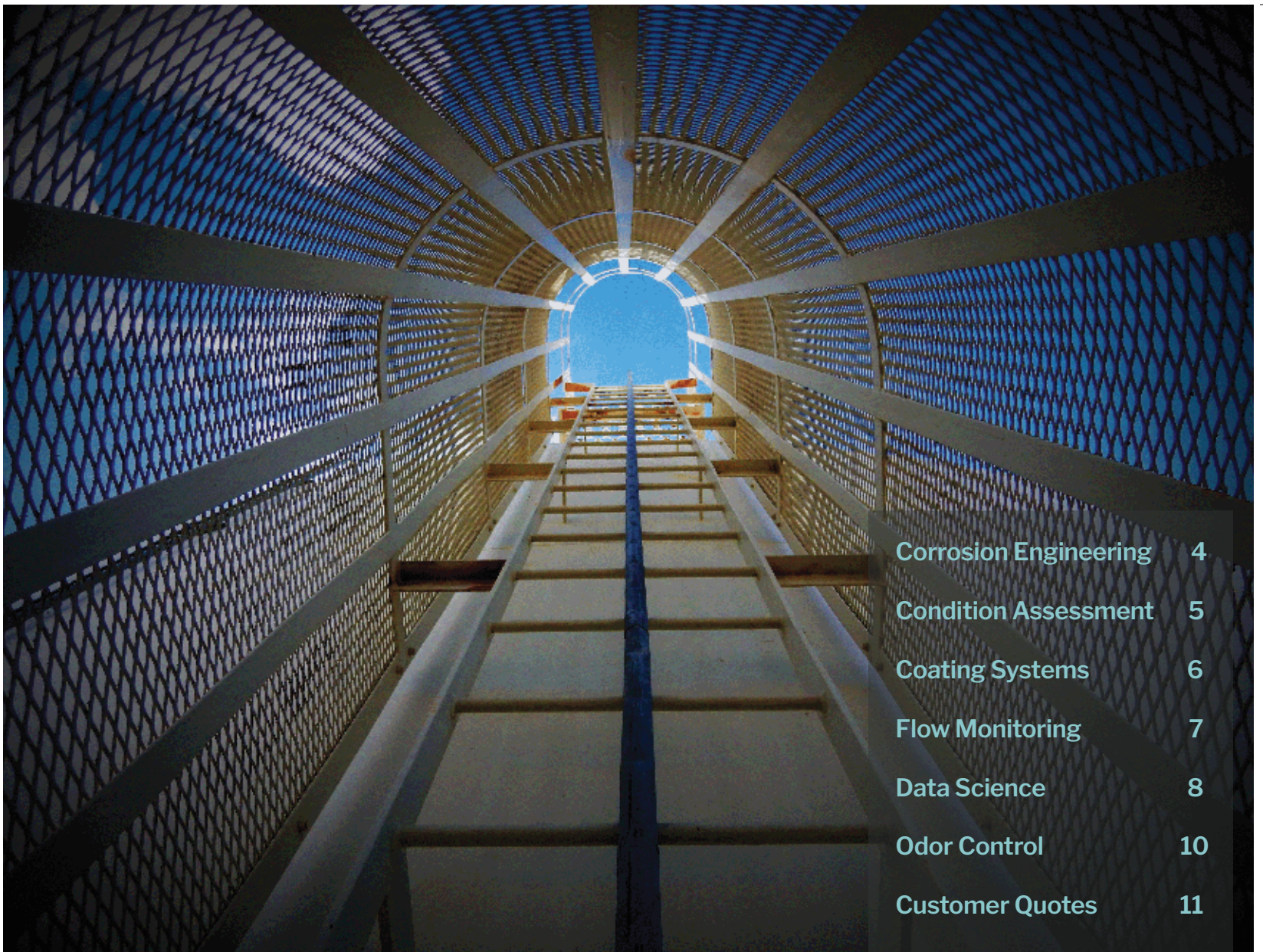
preserving America's infrastructure -  
water, wastewater, light rail

 **V&A**  
consulting engineers

WOSB | WBE | SBE | DBE







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**Debra Kaye**  
President & CEO



*“I was recently asked what differentiates V&A Consulting Engineers? What makes us unique? My logical response to that question was to dive into the technical services that we offer and how specialized we are in what we do. I also included some statistics about aging infrastructure and the daunting issues that our clients face. But that doesn’t touch on why people want to work with us. It is the employees at V&A and the core values we all share:*

**Integrity, Respect, Commitment, Loyalty, Honesty, & Quality**

*We recently celebrated 40 years in business and that is a direct result of the character of our team and our commitment to our clients.”*







## Over 40 years



counting

V&A has extensive hands-on experience and strong working knowledge of the industry's latest tools and technologies. Under our specialized service lines centered around infrastructure preservation, V&A provides field service capabilities and data science services to support our clients.

We are MORE than engineers, however. Our team fully understands the impact of our work on the communities these facilities serve. We are committed to providing sustainable solutions that improve and enhance the quality of life for people and the safety of our environment. You can count on V&A to always be focused on giving you more by applying our skills to meet your needs.





### V&A's in-house corrosion engineering capabilities and specialized services:

- Soil resistivity testing
- Soil and water corrosivity analysis
- Cathodic Protection (CP) system design (drawings, specifications, and calculations)
- Current requirement testing
- CP system commissioning
- AC and DC stray current interference testing and analysis
- Rectifier testing, repair, and adjustments
- CP System surveys (polarized potential, native, close interval surveys, DCVG, ACVG, cell-to-cell, over-the-line)
- External corrosion direct assessment

Learn more about Cathodic Protection. Scan our QR Code:



## CORROSION ENGINEERING

Municipal agencies across the United States bring V&A their projects to advise on **corrosion mitigation** during the design of **new infrastructure** and to **protect existing assets** from the **damaging effects of corrosion**.

Our customers count on us to pinpoint corrosion and its cause, whether atmospheric, immersed, or buried, and recommend solutions for mitigation. Using modern testing technologies, our in-field engineers evaluate environmental conditions to recommend the most effective corrosion protection needed to maximize the life of municipal assets. We focus on the **planning, evaluation, and design** of both new and existing corrosion control systems for **water, wastewater, and transit infrastructure**.

The V&A team evaluates the condition of existing **cathodic protection systems** to identify opportunities for design improvements. We perform field testing to verify the proper operation of existing corrosion control measures, evaluate the extent of existing corrosion damage (if any), and develop feasible solutions to protect critical infrastructure and extend its useful life.

Through field testing and data collection, V&A assists clients with the selection of materials that will perform in corrosive environments, including **coatings, linings, and cathodic protection systems**.



# CONDITION ASSESSMENT

V&A has conducted condition assessments of coated and uncoated steel and concrete structures. Our expertise with materials, their properties and how the environment effects them differentiates us from traditional engineering firms. This expertise results in valuable recommendations and design services for infrastructure rehabilitation or replacements. Our typical projects include **pipelines, tunnels, tanks, digesters, outfall pipelines, water treatment plants, wastewater treatment plants, and pump stations.**

V&A's clients value our approach of deploying registered engineers to manage the technical quality of our condition assessment data and rehabilitation and response recommendations. We understand that decisions regarding future multi-million-dollar capital improvements are often based on our collected data, analysis, and recommended solutions. Our approach to all condition assessment projects is to be **cost-efficient** while meeting project objectives and providing the needed data.

V&A's engineers and field technicians are **confined space trained and certified, and committed to safety.** Our team members are certified through the Association of Materials Protection and Performance (AMPP). Our clients are confident that the data collected and recommendations provided meet the rigorous quality standards.

Our trademarked VANDA® Indexes are a condition assessment rating system for metallic and concrete assets (below), as well as gravity main cleaning (page 8).

## VANDA® CONCRETE CONDITION INDEX

The VANDA™ Concrete Condition Index was created by V&A Consulting Engineers to provide consistent reporting of corrosion damage based on an objective criteria. Typical examples of each condition level are shown at right.



## VANDA® METAL CONDITION INDEX

The VANDA™ Metal Condition Index was created by V&A Consulting Engineers to provide consistent reporting of corrosion damage based on an objective criteria. Typical examples of each condition level are shown at right.



V&A's condition assessment capabilities and specialized services include:

- Visual investigation with photographic and video documentation (drone and 360-camera)
- Dimensional measurements
- Concrete delamination survey (sounding)
- Concrete surface pH
- Concrete penetration
- Surface penetrating radar for reinforced concrete
- Ultrasonic thickness testing on metals
- Broadband electromagnetic scanning of metals
- VANDA® concrete & metal ratings indexes
- Half-cell potential

Read more.  
Scan our QR  
Code:





V&A's in-house coating systems management capabilities and specialized services include:

- Coating thickness measurements
- Coating integrity per ASTM standards
- Adhesion tests
- Hazardous paint sample analysis
- Coating and lining systems drawings and specifications
- Technical review of existing systems

## COATING SYSTEMS

Coatings and lining systems are the first line of defense against deterioration by water, reclaimed water, wastewater, corrosive soils, and chemical exposure. V&A helps clients with **coating assessments, coating selection, specifications, third-party evaluations, and ongoing maintenance.**

Our approach to **coating systems management involves structure assessments** (including confined-space entries) meeting American Society for Testing and Materials (ASTM), International Concrete Repair Institute (ICRI), and Association of Materials Protection and Performance (AMPP) standards; **selecting and specifying appropriate coatings options**; as well as **inspections during construction and third-party**

**evaluation** while monitoring the **coating process in its entirety from surface preparation to curing.**

V&A constantly explores new products and meets with coating manufacturers. We recommend contractors qualified for new and reapplied coatings, and assist the client with requests for information, submittals, and change order requests. We are proponents of third-party inspections and **team up with local coating inspection companies** to monitor the entire process. Coatings are a significant part of the budget of an **infrastructure corrosion protection** system and can **greatly extend the life of the system** when applied correctly and maintained over time. We provide you with expert data and recommendations to ensure that your system has a long service life and maximum value.



# FLOW MONITORING

Since 1998, V&A has supported municipalities and agencies in managing their water and wastewater collection systems and mitigating sanitary system overflows. By collecting timely, accurate data about wastewater flows, we can predict peak flows for a given segment of the system. In addition, V&A helps clients understand the condition of their system and can determine best practices and solutions to avoid overflows.

V&A conducts a wide-range of inflow and infiltration (I/I) analysis for municipalities and master-planning consultants. We specialize in rain-dependent, groundwater and tidal I/I. We also perform reconnaissance to provide clear pictures of system conditions.

When selecting V&A for a flow monitoring study, you are selecting a firm with several unique and differentiating features:

- **Quality Personnel:** Our engineers are “hands-on.” V&A’s engineers are confined-space trained and spend much of their time in the field. V&A believes this provides better continuity, from the field to data analysis to final report deliverables. There are fewer mistakes and miscommunications.
- **Quality Data:** The expertise of V&A’s flow monitoring team stands out in the marketplace because the work is directed by engineers and data integrity is always of paramount importance. Good, accurate data allows for pinpoint predictions of peak flows for a given segment of the system and a useful hydraulic model.
- **Equipment Diversity:** V&A is not affiliated with any meter type, manufacturer, or vendor. Equipment diversity allows V&A a meaningful advantage in determining the proper flow metering technology to match project-specific hydraulic conditions.
- **Quality Reports:** V&A provides professional and quality deliverables. Our team understands that decisions regarding multi-million-dollar capital improvement projects are often based on our flow monitoring data and system capacity analysis.

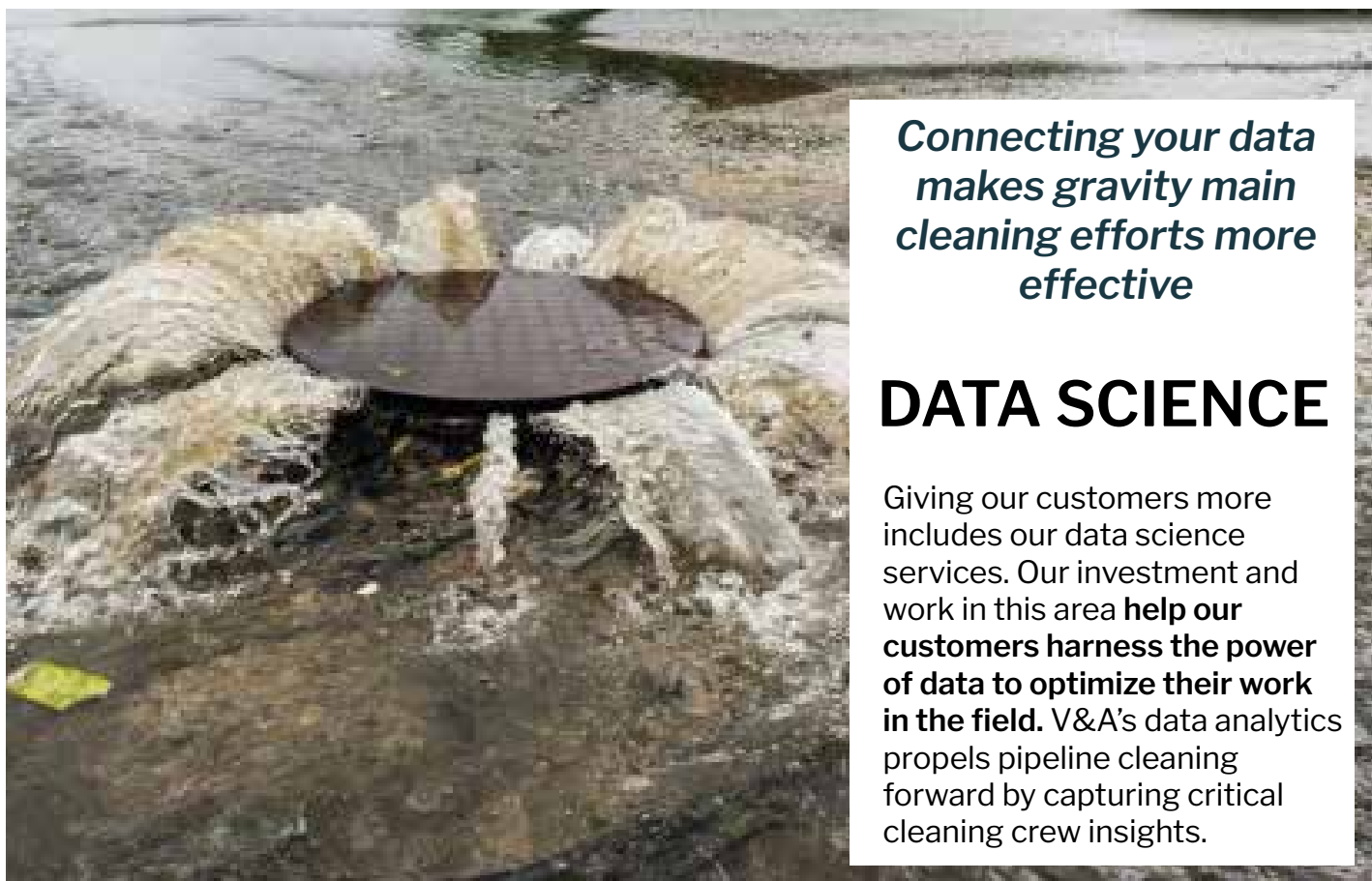


## V&A’s in-house flow monitoring capabilities and specialized services include:

- Sanitary sewer flow monitoring
- Rainfall monitoring
- Event classification
- Infiltration/Inflow (I/I) analysis, design storm analysis
- Flow isolation
- System I/I tracking & detection
- Open stream flow monitoring
- Storm system flow monitoring
- Sanitary sewer smoke testing
- Sanitary sewer wastewater sampling collection
- Dye testing
- Salinity sampling/monitoring

Take a deep drive into Infiltration/Inflow analysis in our City of Cotati, CA Case Study. Scan our QR Code:





**Connecting your data makes gravity main cleaning efforts more effective**

## DATA SCIENCE










Giving our customers more includes our data science services. Our investment and work in this area **help our customers harness the power of data to optimize their work in the field.** V&A's data analytics propels pipeline cleaning forward by capturing critical cleaning crew insights.

### PROBLEM

### V&A SOLUTION

No standard method for collecting condition assessment data during gravity main cleaning	VANDA® Gravity Main Cleaning Condition Index (below)
Stubborn SSO rate	Incremental addition of data science
Dependence on cleaning crew institutional knowledge	Data science captures and builds on crew knowledge and theories-of-causation
Siloed data (GIS, CCTV, cleaning records, SmartCover data)	Joining of all relevant data and addition of best practice data collection methods

### VANDA® GRAVITY MAIN CLEANING INDEX

Condition Rating	FOG (fats, oils, grease)	ROOTS	OTHER SSO POTENTIAL (debris, grit, rags)
Clear	Clear stream during cleaning, no FOG or root smells, no debris on hose		
Light	<ul style="list-style-type: none"> <li>- light FOG on hose</li> <li>- some FOG odor</li> <li>- marshmallow size debris possible</li> </ul> 	<ul style="list-style-type: none"> <li>- twigs in stream or on hose</li> <li>- light "sawed wood" smell possible</li> <li>- no significant removal</li> </ul> 	<ul style="list-style-type: none"> <li>- light debris on hose</li> <li>- grit is fine, sandy</li> <li>- no significant removal</li> </ul> 
Moderate	<ul style="list-style-type: none"> <li>- ice-cube size debris</li> <li>- noticeable FOG odor</li> <li>- flow darker and more viscous</li> </ul> 	<ul style="list-style-type: none"> <li>- some roots trapped and removed</li> <li>- worms on hose or in catch device possible</li> </ul> 	<ul style="list-style-type: none"> <li>- debris caught and removed</li> <li>- solid mass, moves like "slug" or moving plug</li> <li>- oatmeal consistency, like paper mache</li> </ul> 
Heavy	<ul style="list-style-type: none"> <li>- large FOG chunks in stream removed or broken up</li> <li>- strong, distinct FOG odor</li> <li>- "surfboard" contoured chunks possible</li> </ul> 	<ul style="list-style-type: none"> <li>- resistance to hose on upstream path</li> <li>- significant roots removed</li> </ul> 	<ul style="list-style-type: none"> <li>- significant debris accumulated in manhole</li> <li>- potential removal by vacuum</li> <li>- dark matter</li> </ul> 
SSO	SSO with cause(s) as reported		

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Our process provides the solution and can be delivered to you at a basic or advanced level based on your needs. Each step in our process **brings you closer to more informed cleaning decisions.**

# 1 DATA

# 2 ANALYSIS

# 3 APPLICATION

<b>Basic:</b>	<ul style="list-style-type: none"> <li>Analytics readiness assessment of relevant Utility Data from GIS, CMMS, CCTV, SSOs and other data sources</li> </ul>	<ul style="list-style-type: none"> <li>Visualizing data</li> <li>Historical cleaning trends and statistics</li> <li>Condition assessment summaries</li> </ul>	<ul style="list-style-type: none"> <li>Data-driven recommendations for cleaning frequency</li> <li>Benchmarking and best practice recommendations</li> </ul>
<b>Advanced:</b>	<ul style="list-style-type: none"> <li>Programmatic improvement of data</li> <li>Joining relevant utility data and external data (trees, population, buildings, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Likelihood calculations with Machine Learning</li> <li>Variable correlation analysis</li> <li>Pipe segment level degradation curves</li> </ul>	<ul style="list-style-type: none"> <li>Regular progress reviews to proactively adapt schedules</li> <li>CIP planning recommendations</li> <li>Risk-based maintenance plans</li> </ul>
<b>Results:</b>	<ul style="list-style-type: none"> <li>High quality, complete, joined, deep rich data sets ready for OPEX/ CAPEX planning analytics</li> </ul>	<ul style="list-style-type: none"> <li>Data-driven opinions to enable more efficient gravity main cleaning schedules</li> </ul>	<ul style="list-style-type: none"> <li>Implemented and maintained best practices for maintenance</li> </ul>



Read about our Odor Control work for Manatee County, Florida. Scan our QR code:



# ODOR CONTROL

Odor issues are multifaceted. At V&A, our experience in solving both odor and corrosion issues ensures our comprehensive odor mitigation approach cost effectively addresses the three critical issues related to odor control for wastewater collection systems and treatment facilities:

1. **Community Complaints:** We understand municipalities want to be good neighbors by being proactive in responding to odor concerns from the public. Through our analysis and proven mitigation solutions that target the biological, chemical, and physical conditions that contribute to odor generation, we ensure both the immediate odor concerns and long-term odor causing conditions are addressed.
2. **Infrastructure Life:** Covering up odor issues will not be an effective use of budget and resources over the life of the infrastructure. At V&A, we know corrosion is often the most costly impact of hydrogen sulfide (H<sub>2</sub>S) production. By leveraging our deep knowledge of sulfide generation and release, we mitigate the cause of the H<sub>2</sub>S to address the odor and corrosion problems and we provide a more effective long-term solution to infrastructure preservation.
3. **Safe Conditions:** Our engineers understand that the health and safety of municipal personnel are paramount. V&A is skilled in developing and implementing safety plans for the presence of H<sub>2</sub>S.

## V&A's in-house odor control capabilities and specialized services include:

- H<sub>2</sub>S and corrosion mitigation plans
- H<sub>2</sub>S and differential pressure monitoring
- Liquid and gas phase odor sampling
- Field olfactometry
- Fan testing
- Performance testing
- Comprehensive odor control design

## Innovations & Accomplishments:

- Developed odor control solutions, including custom designed biological odor control systems.
- Pioneered and refined monitoring of head-space air pressure in sewers, identifying areas prone to positive pressure and odor release.
- Created a computer-based sewer ventilation model to calculate the air volume released from collection systems and locations prone to odor release.







## FROM OUR CLIENTS

### The City of Sacramento

*“V&A has been very responsive and has been a great help on various water system and storm drainage corrosion issues for our agency. Their field testing staff seems very knowledgeable and capable of helping us address our challenges and provide suggestions in helping us make decisions on-site and to gain information necessary to help support management decisions to critical issues and needs.”*

### Encina City Wastewater Authority


*“V&A consistently prepares comprehensive Health & Safety Work Plans that clearly identify condition assessment field testing methods and define team member roles and responsibilities for field work safety and permit-required confined space entry. V&A team members arrive on site with required certifications and prepared for safety tailgates and lock-out, tag-out procedures.”*

### City of Oakland

*“The City of Oakland has relied on V&A’s expertise in sanitary sewer system flow monitoring, sewer inflow/infiltration analysis, and infrastructure condition assessment for several years. The V&A team has proven their technical abilities through detailed evaluations and improvement recommendations, and even more importantly, they have taken the time to develop a thorough understanding of the City’s staff and procedures.”*





# V&A

consulting engineers

maximizing the service life  
of your most valuable assets

[www.vaengineering.com](http://www.vaengineering.com)

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