



## California Environmental Protection Agency

### NASCIO 2017 State IT Recognition Awards

**Title:** Environmental Complaint System

**Category:** Digital Government – Government to Citizen (G to C)

**State:** California

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**Completion Date:** April 2016

Office of the Secretary  
Air Resources Board  
State Water Resources Control Board  
Department of Toxic Substances Control  
Department of Pesticide Regulation  
Department of Resources Recycling and Recovery

**Edmund G. Brown Jr.**

*Governor*

**Matthew Rodriguez**

*Secretary for Environmental Protection*

## EXECUTIVE SUMMARY

The mission of the California Environmental Protection Agency (CalEPA) is to restore, protect, and enhance the state's environmental quality and economic vitality. CalEPA strives to protect human health and the environment by ensuring compliance with environmental laws and regulations, preventing pollution, and promoting environmental stewardship. CalEPA is comprised of multiple environmental enforcement agencies, including the Air Resources Board, the State Water Resources Control Board and the nine regional water boards, Department of Pesticide Regulation, Department of Resources, Recovery, and Recycling, and Department of Toxic Substances Control. These state agencies work closely with local agencies to enforce environmental laws, such as the local air districts, county agricultural commissioners, local agencies responsible for regulating solid waste, and local environmental health or fire departments responsible for regulating hazardous materials and hazardous waste.

Like any law enforcement effort, ensuring compliance with environmental regulation requires a variety of different methods. One essential element of environmental enforcement is to seek help from citizens by asking them to provide CalEPA with information about potentially harmful activities in their communities and workplaces. Citizen complaints are an important source of information about potential violations of environmental laws and can prove critical in building successful enforcement cases. Because of the complexity of environmental enforcement in California and the number of state and local agencies involved, the public often does not know what activity is an environmental violation, let alone who to contact when they have a concern. Further, citizens frequently report environmental concerns to a single agency, when the concern may require the involvement of several enforcement agencies. Fostering community involvement is a key component in CalEPA's mission to protect public health and the environment. In striving to achieve this mission, CalEPA launched a new Environmental Complaint System in April 2016. The new online reporting system replaced CalEPA's aged legacy complaint system.

The Environmental Complaint System empowers the public to take action when they suspect a problem, and provides them with greater responsiveness, transparency and accountability. The website takes the user through the process of reporting an environmental problem, whether it is related to air or water pollution, hazardous or solid waste, or pesticides. The new complaint website is mobile-friendly, so citizens can submit reports from anywhere with any device.

The new system was built using a government cloud Software as a Service (SaaS) provider and takes advantage of the provider's Platform as a Service (PaaS). The project management methodology followed an agile approach that allowed for greater customer collaboration and input. The cloud services eliminated infrastructure requirements, reduced the complexity of software development, and allowed project resources to focus on customer needs.

## CONCEPT

The mission of CalEPA is to restore, protect, and enhance the state's environmental quality and economic vitality. CalEPA strives to protect human health and the environment by ensuring compliance with environmental laws and regulations, preventing pollution, and promoting environmental stewardship. CalEPA is made up of multiple environmental enforcement agencies, including the Air Resources Board, the State Water Resources Control Board and the nine regional water boards, Department of Pesticide Regulation, Department of Resources, Recovery, and Recycling, and Department of Toxic Substances Control. These state agencies work closely with local agencies to enforce environmental laws, such as the air pollution control districts or air quality management districts, county agricultural commissioners, local agencies responsible for regulating solid waste, and local environmental health or fire departments responsible for regulating hazardous materials and hazardous waste.

Like any law enforcement effort, ensuring compliance with environmental regulation requires a variety of different methods. One essential approach is to seek help from citizens by asking them to provide CalEPA with information about potentially harmful activities in their communities and workplaces. Citizen complaints are an important source of information about potential non-compliance with environmental laws and can prove critical in building successful enforcement cases. Because of the complexity of environmental enforcement in California and the number of state and local agencies involved, the public often does not know what activity is an environmental violation, let alone who to contact when they have a concern. Further, citizens frequently report environmental concerns to a single agency, when the concern may require the involvement of several enforcement agencies.

In order to provide a complete response to environmental complaints and give the public a single place to send their environmental concerns, CalEPA developed its Environmental Complaint System. This application affords concerned citizens a mechanism to report observed environmental problems and provides environmental agencies with valuable information about and evidence of potential environmental hazards and violations. The [CalEPA Environmental Complaint System](#) is an online system that provides a web-based complaint form that is used to collect information about environmental concerns from the public. The system is designed to relay complaint information directly to the appropriate CalEPA enforcement agency for investigation, for coordination with local enforcement agencies, and to track complaint outcomes.

In 2016, CalEPA successfully completed an effort to replace its legacy complaint system with a modernized, secure, reliable and improved solution. Project management methodologies followed an agile approach for application development life cycle resulting in a significantly enhanced system that addressed several issues associated with the legacy solution including:

- Outdated and unsupported software development platform
- Aged system infrastructure
- Lack of standard development practices and methods
- Usability issues associated with required business processes
- Difficult and cumbersome complaint reporting and data mining
- Challenges determining complaint status
- Difficulties with cross-department collaboration
- Problems with referrals and tracking multi-jurisdictional complaints
- Application and database lacked comprehensive security controls
- Data integrity problems resulting from poor database design

The new complaint system resulted in many improvements including:

- Elimination of support and costs associated with maintaining on premise infrastructure
- Greatly improved security, reliability and uptime, proven 99.9+%
- Data protection and recovery planning included in cloud services
- Enhanced system designed for multi-jurisdictional complaint response and tracking
- Modernized reporting including dashboards, canned reports and ad hoc reporting
- Robust system algorithms that dramatically improve search capabilities
- Scalable platform that can be leveraged for forthcoming enterprise system enhancements
- Complaint software application that can be transferred with minimal effort to other departments leveraging the same cloud service provider
- Cloud application that can be easily expanded support new use cases
- Solution provider that supports PaaS for customized applications needs

## SIGNIFICANCE

Environmental complaints submitted by concerned citizens serve as an early warning system, alerting enforcement agencies of potential environmental violations, and providing witness accounts and documentation for investigations. CalEPA and our enforcement partners at the local level address and resolve issues earlier, before they become bigger problems. The new complaint system supports state and local environmental enforcement efforts by providing a statewide tool that facilitates environmental reports reach the proper authority, regardless of the location or the type of pollution. It can also assist communities and agencies that may not have the resources to build their own online systems.

The new CalEPA Environmental Complaint System includes many other helpful features. For example, a critical improvement of the new system was making the complaint form and complainant communications available in Spanish because California includes a large number of

citizens whose primary language is Spanish. Another important feature of the new system is significantly improved dashboards for executives and managers, as well as for the agency staff investigating the complaints. Dashboards present complaint data statistics in real time and support drill-through analysis. Finally, the modernized complaint form allows concerned citizens to attach photos, videos, and documents, a feature the legacy system lacked, and provides investigators with more accurate location information. The legacy complaint system's database design caused issues with reporting, resulting in inaccurate and unreliable metrics. After a year of operations, compared to the prior legacy system, the following statistics illustrate how these improvements increased environmental civic engagement.

- 1,790 new complaints have been received
- 614 multi-jurisdictional complaints
- 947 open and 843 closed complaints
- 57 day average for complaint closure

California's environmental laws are enforced by a matrix of state and local agencies, each charged with enforcing the laws governing a specific media such as air, water, hazardous waste, solid waste, and pesticides. Complaints received in CalEPA's system that fall in the jurisdiction of a local agency are referred to those local partner agencies. For example, concerns about stationary source air emissions are referred to the local air districts, concerns about pesticide misuse are referred to county agricultural commissioners, complaints about solid waste issues are referred to local environmental management or public health departments responsible for regulating solid waste, and concerns about toxic chemicals or hazardous waste are referred to local environmental health or fire departments responsible for regulating hazardous materials and hazardous waste. After investigating the concern, the local agencies are then able to report back into the system about what happened to the complaint. In the legacy system, users were unable to search and report on referrals due to the database integrity issues. Furthermore, the legacy system was unable to determine number of referrals, nor track status of referrals and referral outcomes. The new modernized complaint system allows for greatly improved referral, tracking, communication, collaboration, and follow-up on complaints triaged by this myriad of local enforcement partners.

- Over 50% of complaints were referred to partner enforcement agencies
- 1,034 referrals were investigated
- 116 referrals investigated resulted in related violations

While only 116 violations have been captured in the system, due the complexities of the environmental enforcement process, compliance investigation can be a lengthy process often taking months to issue related violations. It is anticipated this outcome metric will continue to improve.

The improved tracking of complaints and referrals has allowed the new system to greatly improve CalEPA's communication with the users reporting concerns into the system. When an email address is provided, the user will receive an email confirmation of the complaint submitted into the system. Once the complaint has been assigned or referred for investigation, a separate email will be sent out to the user listing the agencies and contact information. This provides the public with a more convenient process and allows them to follow up with state or local agency staff.

Aligning with CalEPA's strategic and policy goals to prioritize environmental justice, one critical improvement to the system involved identifying complaints that may impact disadvantaged communities – communities that are suffering from cumulative impacts of multiple sources of pollution and who are vulnerable to the effect of pollution. Complaints received are

**630 Environmental  
Justice Related  
Complaints  
Reported**

automatically cross-referenced with CalEPA's Environmental Justice (EJ) data sets available for California Communities Environmental Health Screening Tool called [CalEnviroScreen](#). CalEnviroScreen data is derived from a screening methodology to help identify California communities that are disproportionately burdened by multiple sources of pollution. When a complaint is filed, its location (if provided) is automatically geocoded based on address, then assigned

a CalEnviroScreen score based on census tract. If the score is within an area identified as disadvantaged, the complaint is flagged and CalEPA's executive stakeholders are automatically alerted of this reported concern. Environmental enforcement agencies handling complaints are also given this additional information to identify complaints that may require special attention.

## IMPACT

The new Environmental Complaint System provides many benefits to CalEPA, its enforcement partners and the public. The online reporting system helps democratize environmental protection by giving citizens a voice in the fight against pollution and environmental hazards. It allows the public to be the eyes and ears of environmental protection, giving the people a voice that helps CalEPA in environmental regulation and enforcement. The new system gives citizens an easy-to-use tool for reporting environmental concerns affecting their community, whether the issue is related to air or water pollution, solid or hazardous waste, or pesticides.

**2,123 Photos,  
Videos and  
Documents Provided  
as Supporting  
Evidence**

The system can identify the users' location using GPS and allow them to upload photo, video and other documentation of the suspected hazard. It is also a mobile-friendly platform, so citizens can submit reports from anywhere with any device. While the website was developed to support a responsive design for mobile devices, future plans including include extending the system into a mobile application.

The results of this civic engagement has had significant impact, and public complaints received and investigated have led to the discovery of over a hundred environmental violations, helping CalEPA and its enforcement partners protect California's public health and the environment.

The technology approach embraced innovation by leveraging SaaS and PaaS, resulting in cost savings associated with building, maintaining and hosting infrastructure. PaaS affords reduced costs and increased speed of development and deployment for customized application objects required to meet CalEPA business needs. Leveraging SaaS has alleviated CalEPA from worrying about hosting and maintaining server operating systems, applications, database, network and infrastructure, entrusting the cloud service provider for security, reliability and uptime. Results of the shift to a cloud service provider have resulted in many benefits including:

- Better reliability and uptime, proven 99.9+%
- Redundant data protection and recovery planning
- Cost savings associated with the elimination of on premise infrastructure
- Easy-to-use interface for users and administrators
- Scalable platform that supports integration in various forms

CalEPA continues to seek and achieve process improvements to better complaint management and increase civic engagement. The complaint system's cloud service provider supports robust extensibility options for future extendibility of the complaint system including web services, improved features for partner coordination and improved citizen outreach. Data availability components planned as complaint system enhancements for the future include:

- Opening complaint data to the public
- Allowing complainants to look-up online complaint status
- Increasing system access for environmental enforcement partners
- Improving access for tablet/smartphone devices with a mobile application

The CalEPA Environmental Complaint System enhancement roadmap is expected to provide several benefits and result in outcomes that support several strategic goals for CalEPA, U.S. EPA and local government including:

- Increased transparency
- Improved outreach and access for complainants
- Better collaboration and response coordination with environmental enforcement partners
- Innovation to improve civic engagement