

**Regional Stormwater Training Project**  
Contract Number **582-6-77812**

**Final Report**  
**December 2007**

---

**Prepared By:**

Galveston Bay Construction Alliance  
City of Baytown Stormwater Division  
220 West Defee  
Baytown, TX 77522

*Project Manager*  
Rory Lang  
Stormwater Coordinator  
City of Baytown

**Prepared for:**

Galveston Bay Estuary Program  
Texas Commission on Environmental Quality  
17041 El Camino Real, Ste. 210  
Houston, Texas 77058



*Contract Manager*  
Steven R. Johnston

## **I. Executive Summary**

In 2006, the City of Baytown was awarded a grant from the TCEQ to develop a video to train construction site operators to comply with TPDES stormwater regulations. The project was a part of the efforts of the Galveston Bay Construction Alliance (Alliance) to improve water quality and prevent stormwater pollution in the Galveston Bay area.

The Alliance created a 15 minute training video in both English and Spanish (24 minutes) that provides information on stormwater requirements for construction projects as well as an introduction into the potential Best Management Practices that could be utilized at construction sites. The training is primarily for owners of construction projects and general contractors who supervise construction projects. Viewing of the training video is a prerequisite for obtaining a building permit in all participating municipalities. In addition to the development of the video, the funding provided the necessary viewing equipment for all participating municipalities to ensure that no conflicts arose pertaining to the availability of a television and DVD player or VCR so applicants for permits could efficiently complete this requirement.

The project provided local jurisdictions with the capability of establishing a regional report card for local developers that conduct business within their boundaries via the publication of a website for online data entry regarding the improvement (or lack thereof) in stormwater compliance for those projects where key personnel have viewed the training video.

Current participants include City of Baytown; City of Pasadena, City of Seabrook, City of League City, City of Webster, City of La Porte and, City of Friendswood, City of Texas City and Chambers County.

## II. Table of Contents

I. Executive Summary .....	1
II. Table of Contents .....	1
III. Source of Funding .....	1
IV. Project Description.....	2
V. Procedure .....	3
VI. Results.....	10
VII. Conclusions.....	11

## III. Source of Funding

Task	Rate*	Units	Matching Funds	Grant	Total Cost
<b>Salaries and Wages</b>					
City of Baytown Coordinator	\$50.00	100	\$5,000.00		\$5,000.00
City of Pasadena Coordinator	\$50.00	250	\$12,500.00		\$12,500.00
Work Team Members not listed above	\$50.00	175	\$8,750.00		\$8,750.00
<b>Fringe Benefits</b>	-	-	-	-	-
<b>Travel Costs for Presentation at GBEP Symposium</b>				\$400.00	\$400.00
<b>Supplies and Materials</b>					
Postage				\$100.00	\$100.00
Office Supplies				\$500.00	\$500.00
Training equipment for participating agencies		20		\$10,000.00	\$10,000.00
<b>Contractual</b>					
Training Video		1		\$15,000.00	\$15,000.00
Reporting database (City of Pasadena)	\$50.00	250		\$12,500.00	\$12,500.00
<b>Total Direct Costs</b>			<b>\$26,250.00</b>	<b>\$38,500.00</b>	<b>\$64,750.00</b>
<b>Indirect Costs</b>	-	-	-	-	-

## **IV. Project Description**

The Galveston Bay Construction Alliance created a Regional Stormwater Training Video for the Construction Industry and provided participants with dedicated equipment (Television and DVD player) for training purposes associated with this program. Completion of the training video and subsequent stormwater practices reviews conducted by participants will be utilized to create a regional report card for local developers that will be published in a database accessible to participants. This project will assist with implementation of non-point source pollutant reduction in new development as well as with establishing regional construction standards for non-point source pollution reduction as outlined in the NPS Action Plan of the Galveston Bay Plan.

### Project Goals:

The primary goal of this project was to train local developers and contractors about stormwater requirements for construction projects with a consistent message from jurisdictions throughout the Houston-Galveston Area. The effectiveness of the training will be evaluated by participants with a regional report card database.

The Alliance created a training video in both English and Spanish that provides information on stormwater requirements for construction projects as well as an introduction into the potential BMPs that could be utilized at construction sites. It is focused primarily on owners of construction projects and for general contractors who supervise construction projects. Viewing of the training video is a prerequisite for obtaining a building permit in all participating municipalities. In addition to the development of the video, the funding provided the necessary viewing equipment for all participating municipalities to ensure that no conflicts arose pertaining to the availability of a television and DVD player so applicants for permits can efficiently complete this requirement.

In addition, the project provided regional coordination and consistency for construction standards in an effort to provide local contractors with a firm understanding of the stormwater regulations and their implementation that will be required no matter where their project is located with the Houston-Galveston Area. All participants were involved in the development of the script for the video as well as the final editing of the completed product and the database features for report card development. The Alliance also worked with a number of developers to expand the idea and to ensure the inclusion of an explanation for any regulations that have historically caused confusion.

This effort went beyond the requirements of TPDES due to its regional nature and the comparison of trained contractors with untrained contractors with the regional report card. Consistency among jurisdictions within the region will assist the local construction industry in complying with stormwater requirements through standardization of processes and repetitive messages. The project also addresses duplication of efforts and provides local jurisdictions with

the capability of establishing a regional report card for local developers that conduct business within their boundaries.

## **V. Procedure**

### **1. Project Development**

The Alliance Work Team developed the project work plan (Attachment 1) to direct the project work team through each phase of the project. A literature search (Attachment 2) was also conducted during the first phase of the project, which involved contacting other jurisdictions that had developed training programs for construction site stormwater control. The Work Team obtained videos from Harris County/KB Homes, TxDOT Beaumont District Construction training video and Wal-Mart construction training video and also received input from San Antonio Water System (SAWS) staff regarding their training workshops. The videos were screened for ideas and the feedback received from SAWS was utilized to improve on the original design of the training video.

### **2. Formal Invitation to Participate/Inter-local Agreements**

In an effort to encourage the widest participation in the project possible, a formal invitation to participate in the Video Project was sent to all contacts in the HGAC city/county mailing list. The first formal invitation letter was mailed on September 11, 2006. The Work Team received several responses to the letter. Additional efforts to included an announcement was made at the *Small MS4 General Permit Workshops* held at the Johnson Space Center on November 6, 2007.

Once the Work Team received statements of interest from participants, it was necessary to formalize the agreement to participate. The City of Baytown prepared text for the inter-local agreements to provide for the purchase of a television and DVD player for project participants. The agreement specifies uses and tracking for the equipment. Text for the inter-local agreements was provided to each of the participants on October 17, 2006. Direction was given to complete the paperwork, get appropriate signatures and return the originals to the City of Baytown.

Completed inter-local agreements were received from Chambers County, Webster, Pasadena, La Porte, Seabrook, Friendswood and League City. Official signed copies were submitted to the City of Baytown's City Manager on May 15, 2007. Once the official documents were signed by the City of Baytown, equipment was purchased for the participants following a cost analysis conducted by the City of Baytown Purchasing Department. Originals of the completed agreements are kept on file with the City of Baytown's City Clerk's office and copies were returned to each city.

### **3. Work Team Meetings**

Alliance members created a work team including both city representatives and representatives from the construction industry (see table below). Each City that participated had a designated person to serve as a work team member who provided in-kind service hours for the project.

<b>Work Team Member Name</b>	<b>City</b>
Rory Lang	Baytown
Brian Craig	League City
Sam Metzger	Pasadena
Frank Manigold	Friendswood
Steve Gilett	La Porte
Brandy Curtis	La Marque
Ron Dysart	Texas City
Gene Jones	Nassau Bay
Kevin Padgett	Seabrook
Joe Ferro	Webster
Marshall Klinksales	Developer
Don Johnson	Developer
Danny Martin	Developer
Mark Stanley	Developer

Work Team meetings were held regularly during the project so the work team could provide direction and discuss any issues that arose.

#### **4. Script Development and Translation**

The development of the script began with the creation of a list of the training points needed in the video. The Work Team developed a list of overall messages to be included in the video, along with a story board to focus the discussion on specific BMPs seen most often locally.

The selected messages were as follows:

- Main message – “Whichever BMPs you choose to use are okay with us – as long as the BMP is effective we are happy with it.”
- Pictures of sites with stormwater issues – situations that contractors should avoid highlighting the BMPS below:
  - General Permit requirements prior to start
  - BMPs
    - Phasing of construction/soil disturbance/stabilization of areas that will not immediately be worked on.
    - Inspection requirements (weekly or every 2 weeks and after rain)
    - Erosion Control/Water diversion
    - Sediment Control – inlet protection, back of curb protection, temporary sediment basins vs. detention ponds.
    - Stabilized construction exits/entrances – emphasize tracking issues and ideas for subdivisions and driveways

- Stockpile containment – emphasize placement (away from impervious areas)
  - Other waste, trash and debris – includes concrete washout stations and trash receptacles, sanitary facilities
  - Final stabilization and removal of temporary controls
  - Filing of NOT
- Penalties and fines associated with stormwater violations are more expensive than it costs to comply in the first place
  - Regulations – EPA, state and City requirements under the MS4 permit
  - Permit holders responsibility – even if a subcontractor is damaging the BMPs
  - Whoever is named on the permit as a contractor/subcontractor could be held responsible.
    - \*Issue – stormwater permit vs. local construction permit (some cities don't have a local permit and state permit must be applied for by individual owner/contractor etc.)

Based on these training points, a draft script was prepared and distributed to Work Team members on October 23, 2006. Work Team members reviewed the draft script and storyboard and made comments for improvements. The third draft of the script was sent to Work Team members on December 22, 2006. Final comments were received and incorporated into the final script on December 31, 2006. Additional changes to the script did occur during filming.

## **5. Production Company Selection**

The Work Team conducted research into local production companies who would receive the request for bids notice. The notice was sent to XXX companies and the Alliance received six bids for production services for the development of the training video. Companies submitting bids included AFS Video Productions, Stonehenge Productions, Star Video Productions, Motion Video Productions, Space City Films, and Zodiac Productions. The bids ranged from \$11,640.00 to \$24,000.00. Alliance members selected Stonehenge Productions to provide production services for this project based on their past experience, BMP footage availability, and overall quality of production.

## **6. Video Production/Sound Recording**

Once the Purchase Orders for the Video Production were in place, the Work Team began developing ideas for footage selection and shooting. Work Team members began selecting footage for the training video from existing Stonehenge Production public domain footage on December 4, 2006. Representatives from Stonehenge Productions attended the December 4 Work Team meeting to discuss scene preferences and walk the group through the existing footage. Several frames were deemed appropriate for use in the training video and a list was developed linking specific frames to lines of narration. Additional work was completed to

determine which lines of script still needed footage so a shooting schedule could be developed based on specific footage needs.

Once the Work Team had established the exact footage that needed to be shot, the team brainstormed ideas for sites that would provide a good setting for each topic. Selected sites included:

<b>Topic</b>	<b>Site Name/Address</b>	<b>City</b>
Visual for natural water body, people walking on trail	Goose Creek Trail Todville Road Armand Bayou Crenshaw Park	Baytown Seabrook Pasadena Pasadena
Construction Site Inspector Activities	Piedmont Apts West Greenwood/AB Eng Hunters Ridge	Baytown Chambers Co Baytown
Site in initial stages	Eastpoint Section 4 Lakes at Fairmont Green Site on 518	Baytown La Porte Pearland
Site stabilization	Legends Bay (hydromulching) Port Crossing	Chambers Co La Porte
Well Placed Sanitary facilities	Bowie Elementary Elementary 14	Baytown Baytown
Concrete Washout station	Devinwood	Baytown
Workman sweeping debris, running a street sweeper	Bayview Apts	Baytown
Damaged silt fence/inlet protection	Any and all	
Recently completed site	Strawberry Glen Sunrise Meadows Deer Creek Crossing	Pasadena Pasadena Pasadena

Shooting began on May 15, 2007. The City of Baytown accompanied the production staff to 8 sites in Baytown, 4 sites in Pasadena, and 1 site in Pearland and 1 site in Friendswood for a complete day of shooting. Footage taken included street sweeping, proper BMP placement, perimeter controls, stabilized construction entrances, storage containers, and a number of “how not to” examples.

Additional footage was shot on May 29<sup>th</sup> in Pasadena for a half day shoot. Footage taken that day included a stabilized construction entrance, citizens enjoying a nature trail next to a waterway, and stabilized detention ponds. Rory Lang met with the staff at Stonehenge Productions on July 9<sup>th</sup> to begin the editing process with existing footage. This session helped provide a more concise course of action for the remaining day and a half of shooting. Additional editing took place from August 13 – 15<sup>th</sup>. Items completed included recording of the narration, identification of footage sections, and the tying of footage to specific points of narration.



An additional half day of filming took place on August 9 in Houston with the help of Construction Ecoservices. Items shot that day included an inspector looking at a site and talking to a construction supervisor, storage areas for chemicals/fuel, concrete washout in progress, and final stabilization.

The final footage was shot on October 16<sup>th</sup> at the City of Baytown. Items included a contractor requesting a permit to build from the City, a contractor reviewing the Construction General Permit, a contractor telling his subcontractors to watch for the stormwater BMPs and final BMP removal was the site was fully stabilized. The City of Baytown and Stonehenge Production Company staff completed editing during several editing sessions from July to December 2007. Following the final editing of the videos, Stonehenge Productions created personalized videos for each participant utilizing city/county logos.

The selection of the talent for the narration was conducted concurrently with the video shoots. Work Team members received a list of suggested narrators from Stonehenge Productions in December 2006 and listened to samples of their work at [www.pbtalent.com](http://www.pbtalent.com). Members voted for their top choices so that an audition with the video script could be held. The Work Team selected Al Amado and Jim Conlan to audition for the part. Auditions took place through Stonehenge Productions and Jim Conlan was selected. The English sound session was held at the Soundworks Studio in Houston on August 13, 2007. The Spanish talent (Luz Locke) was provided by the City of Pasadena and the sound session was held on October 16, 2007.

The videos were distributed in December 2007 and January 2008 to existing participants. Additional videos are available for use by any interested party by contacting:

The City of Baytown Health Department  
220 West Defee  
Baytown, Texas 77522  
(281) 420-5384.

## **7. Database Development**

The Work Team sought to establish a web-based database for the regional construction site operator report cards. The City of Pasadena agreed to provide a separate web server for 500 KB of to house the database and publish it on the World Wide Web.

The Work Team developed a list of database parameters during Meeting 1 (July 13, 2006) and reviewed and revised them during Meeting 2 (August 31, 2006).

- Online access restricted to participating cities
- Compiled scores over time
- Printer friendly
- Searchable
- Ability to send regular reports to City Managers
- Possible public viewing of grades – provided we get clearance from legal counsel

- Running tally of the number of contractors/developers trained
- Contact information for the City Representative entering the grading information into the database
- Development of a grading scheme to ensure equitable grading across the board.
- A before and after questionnaire to determine if trainee actually learned something by watching the video.

The final database will be an online spreadsheet containing all pertinent information regarding construction work taking place. The criteria of information that will be listed includes, but is not limited to, the following: .

- Construction Company Name
- Site Supervisor
- Site Name
- City where work was located
- Grade
- Additional Comments

The implementation of the website for online access will be concurrent with an entirely new software system for the City of Pasadena web page. The new system will be browser based meaning no third party software is going to be required for updating; it can be done from any computer with online access via login. Some further research involving the actual database side of the application in coordination with the City of Pasadena webmaster will bring forth a very user friendly and useful website package to use for the database as well as all other website needs.

## **8. Training Implementation**

The main objective of this project was to provide training for local developers and contractors about stormwater requirements for construction projects with a consistent message from jurisdictions throughout the Houston-Galveston Area. The effectiveness of the training program is tracked through the regional report card database.

The first step in implementing the training portion of this project was to provide the equipment necessary for showing the training video. Eight of the ten televisions and DVD players that were purchased for this program have been distributed to participating cities – including the cities of Seabrook, Webster, La Porte, League City, Pasadena, Baytown, Friendswood and Chambers County. In addition, inquiries regarding participation have come from the City of Humble, Texas City and several consultants so the remaining equipment will be distributed on a first come, first served basis.

Each participant signed an inter-local agreement that established the training guidelines and methodologies for incorporating the training into the building permit application process. The agreements require that each Participating Entity requires the viewing of the Regional Stormwater Training video as a condition precedent to obtaining a permit for construction subject to stormwater regulations; provided that an individual shall not be required to watch the

video more than once per twelve-month period. The videos were distributed in late December 2007 with the intent that all participating entities would begin the training immediately.

The evaluation operator performance following training will take place during 2008 and results will be published on in the report card database provided by the City of Pasadena. The work team created a list of scoring criteria to be utilized in the database as listed below:

Initial Scoring:

- Properly installed and maintained perimeter controls
- Properly installed and maintained stabilized construction entrance/exit
- Properly installed and maintained inlet protection
- Properly placed port-o-can
- Street sweeping conducted regularly
- SWP3 on site and inspection reports up to date
- SWP3 posting exists and is correct
- Storage of potential pollutants (paint, cleaning solutions, etc) under cover
- Concrete washout station available and used
- Stockpiles are placed and stored properly
- Water pumped from the site is filtered and/or settled to remove sediment
- Trash and debris are collected and disposed of properly
- Driveway entrances and curb cuts are protected to prevent internal tracking

Bonus Points:

- Use of innovative and cutting edge BMPs
- Education of subcontractors occurs
- Signs are posted with BMP reminders (example: at entry/exit and at concrete washout station)
- Responsive to MS4 inspector's suggestions.

## **VI. Results**

The primary goal of this project was to train local developers and contractors about stormwater requirements for construction projects with a consistent message from jurisdictions throughout the Houston-Galveston Area and to evaluate the effectiveness of the training through a regional report card database.

The Alliance created a 15 minute training video in both English and Spanish (24 minutes) that provides information on stormwater requirements for construction projects as well as an introduction into the potential Best Management Practices that could be utilized at construction sites. Viewing of the training video is a prerequisite for obtaining a building permit in all participating municipalities. In addition to the development of the video, the funding provided the necessary viewing equipment for all participating municipalities to ensure that no conflicts arose pertaining to the availability of a television and DVD player or VCR so applicants for permits could efficiently complete this requirement.

The project also provided local jurisdictions with the capability of establishing a regional report card for local developers that conduct business within their boundaries via the publication of a website for online data entry regarding the improvement (or lack thereof) in stormwater compliance for those projects where key personnel have viewed the training video.

Current participants include City of Baytown; City of Pasadena, City of Seabrook, City of League City, City of Webster, City of La Porte and, City of Friendswood, City of Texas City and Chambers County.

Consistency among jurisdictions within the region will assist the local construction industry in complying with stormwater requirements through standardization of processes and repetitive messages. The project also prevents duplication of efforts for stormwater BMP training as required under TPDES.

Additional materials created as part of this project include an extensive Literature Search regarding training in stormwater BMPs with an emphasis on construction site stormwater control, inter-local agreement text that provides for equipment distribution and information sharing as well as program implementation procedures.

## VII. Conclusions

The Regional Storm Water Training Project has been moderately successful at achieving the goals stated at the beginning of the project including producing the training video in both English and Spanish and providing the needed training equipment to participating entities. However, the project team experienced some difficulties with collecting appropriate footage, producing the regional report card database, and with bringing in new participating entities.

As the project team set about looking for actual construction sites to film the needed video footage, it was discovered that very few contractors were in compliance with stormwater requirements and even those that were attempting to implement the necessary BMPs were not keeping them maintained. Although the project team was able to get most of the footage needed, some pieces were staged to ensure the example in the video was adequate. Areas that were staged included back of curb protection, temporary stabilization methods, and BMP removal at the end of the project.

The regional report card database is not yet complete due to updates to the City of Pasadena website. The implementation of the website for online access will be concurrent with an entirely new software system for the City of Pasadena web page. The new system will be browser based meaning no third party software is going to be required for updating; it can be done from any computer with online access via login. Some further research involving the actual database side of the application in coordination with the City of Pasadena webmaster will bring forth a very user friendly and useful website package to use for the database as well as all other website needs.

At the end of the project time frame, seven cities and one county have officially agreed to participate and some interest from other agencies has been expressed although nothing concrete has occurred with those entities. The project team had expected more participation from TPDES Phase II communities at the outset of the project. However, the TPDES Phase II permit did not pass until August 2007 so it is assumed that many smaller cities did not sign on at the first invitation (September 2006) since it was not a requirement at that time. The project team has ensured that any city interested may still receive a free copy of the video at any time, although they will not be eligible for the viewing equipment once the final 2 sets are distributed.

The remaining work on the project includes publication and population of the report card database as well as the distribution of the final two sets of viewing equipment. This project has provided the Galveston Bay Construction Alliance with a strengthened sense of purpose and a renewed understanding of the areas of compliance that local contractors are still having difficulty with (back of curb protection, temporary stabilization methods, and BMP removal at the end of the project). This information guided the development of the video and will also help the participating entities refine their construction site stormwater inspection methods so that these items can be addressed and construction site contractors can be informed on the various BMPs that are available for these issues.