

## DIVISION 600 SUPPLEMENTAL GUIDANCE 1 – CONSTRUCTION STORMWATER AND ENVIRONMENTAL MANAGEMENT

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### INTRODUCTION

This supplemental guidance to Division 600 is incorporated into the ALDOT Construction Manual due to the topic's broad application for many different types of projects and its encompassing of multiple contract specification sections. Administration and inspection related to the subject of this topic also require specific technical training, expertise, and credentialing. For other technical information related to subjects addressed within this topic, see Construction Manual Topics that correspond to specific SSHC divisions and sections. A listing of related ALDOT Standard Specifications for Highway Construction (SSHC)

references and resources that provide additional information regarding this subject are provided in Contract References and Resources portion of this document.

Stormwater runoff from ALDOT construction sites has the potential to threaten public safety, create operational inefficiencies, cause unnecessary economic loss, and negatively impact built and natural environments. These potential outcomes are contrary to both ALDOT's stated *mission* and its *Environmental Policy and Priorities*. The discharge of construction stormwater runoff is regulated by the Alabama Department of Environmental Management (ADEM) and ultimately the United States Environmental Protection Agency (EPA).

The project designer, project inspectors, and the contractor all have specific responsibilities in the development and implementation of the Construction Best Management Practices Plan (CBMPP) and ensuring compliance with the Construction General Permit for Construction Stormwater Discharge (CGP). This supplemental guidance provides information and resources for the Project Manager and Inspector to reference as they work to ensure regulatory and contract compliance related to construction stormwater management.

### DOCUMENTATION

#### GENERAL PERMIT FOR CONSTRUCTION STORMWATER DISCHARGE

The ADEM CGP satisfies the requirements of the National Pollutant Discharge Elimination System (NPDES) of the Federal Clean Water Act. The CGP provides regulatory permission to discharge stormwater runoff associated with a construction activity in exchange for agreement to abide by the conditions and requirements of the CGP.

#### EROSION AND SEDIMENT CONTROL PLAN SHEETS

Erosion and Sediment Control plan sheets are developed by the project designer to graphically represent how construction stormwater runoff is to be managed during at least three phases of

construction. The Erosion and Sediment Control plan sheets also indicate the locations of all discharge and background points for the project.

Project phasing and stormwater discharge and background points are described with examples later. Contract documents, including all plan sheets relevant to managing construction stormwater become a part of the CBMPP described below.

## **CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN**

The CGP requires that a CBMPP be created and implemented by those intending to discharge construction-related stormwater runoff. A CBMPP is an implementation document describing the planned and required work of a contractor to protect the quality of receiving waters and maintain regulatory compliance as construction work is carried out. ALDOT requires that a CBMPP be created and maintained for every ALDOT construction project that requires construction stormwater permit coverage. The CBMPP is also a means to communicate other environmental concerns, commitments, and contract requirements to ALDOT design and construction personnel and to the contractor. The CBMPP helps to document environmental compliance by housing site inspection reports, rainfall data, and erosion and sediment control plan modifications.

ALDOT creates and implements the CBMPP for projects in two distinct components – a Design Component and an Operational Component. CBMPPs for projects located in Priority Construction Sites reflect approaches and practices that are enhanced above ALDOT base standards. Designations of Priority Construction Site status is noted in the CBMPP.

Where the contractor is required to secure permit coverage (for offsite waste and borrow areas and some projects when required by the contract documents) the CBMPP is prepared by the Contractor Qualified Credentialed Professional (QCP) using an ADEM approved format. The Contractor's CBMPP must include the same concerns, commitments, and contract requirements made as part of the preliminary CBMPP provided by ALDOT and must satisfy all the requirements of the ADEM regulations.

**CBMPP Design Component.** The Design Component of the ALDOT CBMPP is created and updated during the planning and design phase by ALDOT and/or consultant design personnel. The Design QCP (described later) certifies the Design Component of the CBMPP as having addressed all known environmental concerns, and that these concerns have been addressed in the project design.

The Design Component consists of three main sections: Project Information, Environmental Concerns and Commitments, and Environmental Best Management Practices (BMPs). The Project Information section compiles the ADEM Notice of Intent (NOI) and USGS topographic quadrangle map for the project, properties of the soil expected to be encountered, and hydraulic information including the anticipated rainfall conditions and the minimum design storm for temporary best management practices (BMPs). The Environmental Concerns and Commitments section provides information regarding construction stormwater and other environmental topics of concern such as wetlands, priority waters, threatened and endangered species, historical and archaeological sites, and hazardous materials. The Environmental BMPs section provides standard information from the ALDOT Construction Manual, ALDOT Specifications, ALDOT Standard and Special Drawings, and project

specific information. The Erosion and Sediment Control Plan (ESCP) in the project plan sheets is referenced by and a part of the CBMPP.

**CBMPP Operational Component.** The Operational Component of the CBMPP is created and updated during the construction phase by ALDOT project personnel and contractor personnel. The Operational QCP (also known as the Project QCP), which is typically the Area Stormwater Coordinator, certifies that the design component will be adhered to as closely as possible, and that the Operational Component will be created, updated, and adhered to during construction of the project.

The Operational Component consists of five sections - Contractor Submitted Components, ALDOT Inspection Reports, Rainfall Journal, Regulatory Actions Log, and CBMPP Modifications Log. The contractor-submitted components include the Contractor's Stormwater Management Plan and any other environmental correspondence between ALDOT and the contractor. The ALDOT Inspection Reports section has an ALDOT QCP CBMPP Evaluation Log and completed stormwater inspection reports including any required turbidity sampling data. The Rainfall Journal section includes a chart of the locations of all traditional rain gauges and any Virtual Precipitation Monitoring (VPM) points, and a monthly printout of the rainfall journal from the CPMS Stormwater Tracking System (SWTS) database. The Regulatory Actions Log includes a chart of all actions by environmental regulatory agencies and all corresponding documentation. The CBMPP Modifications Log includes a chart of all CBMPP modifications and corresponding documentation.

## **CONTRACTOR'S STORMWATER MANAGEMENT PLAN**

The Contractor's Stormwater Management Plan (SWMP) is an implementation document created and certified by the contractor to provide CBMPP implementation information to ALDOT prior to the commencement of work. The SWMP becomes a part of the Operational Component of the CBMPP once accepted by ALDOT.

The SWMP is project specific, addresses all known environmental concerns and commitments, and explains how requirements of the contract documents regarding water quality protection will be met by the contractor. A SWMP is required for all projects regardless of the type of work, funding, or regulatory permitting.

The contractor is required to use the most current version of the ALDOT SWMP Template at the time of contract letting. The template format must not be modified. If modification is discovered, the SWMP is considered to be incomplete. The SWMP is submitted directly to the Area Stormwater Coordinator, or to the County Engineer for County projects, prior to the Preconstruction Conference and On-site Stormwater Meeting. The Construction Bureau may review the SWMP prior to approval if requested to do so. Construction Bureau review and acceptance is required if the project includes Roadway Pipe Rehabilitation or Bridge Cleaning, or if the contractor requests a stream or waterbody encroachment or on-site storage of fuels/chemicals. Once the SWMP is accepted by the Area office, it is added to the Operational Component of the CBMPP.

For projects where the contractor procures permit coverage, a separate SWMP is not required if all required information is included in the contractor's CBMPP.

### **ONSITE STORMWATER MEETING CHECKLIST**

Area Stormwater Coordinators use Form C-42, Onsite Stormwater Meeting Checklist as a guide for Onsite Stormwater Meeting discussions. The form includes topics that will be covered and a sign-in sheet for meeting attendees. Acknowledgements and notes are made on the form during the meeting and sent electronically to the Construction Bureau Environmental Construction Section (ECS) afterward for documentation and record keeping. A copy of the completed form is also added to the CBMPP Operational Component on file at the project office.

### **CONSTRUCTION STORMWATER INSPECTION AND REPORTING FORMS**

Detailed field conditions, observations, and other site inspection information entered into the SWTS and documented on ALDOT Form C-34 (Stormwater Inspection Report and BMP Certification). Form C-34a Stormwater Discharge and Background Points is a listing of the Stormwater Discharge and Background Points created by the designer as plans are developed and initial permit coverage is secured.

Regulatory noncompliance requires additional reporting and documentation. Citations of Sediment Loss and Turbid Discharge on stormwater inspection reports are further described in the SWTS to create Form C-37 (Stormwater Noncompliance Notification Report). Turbidity sampling and monitoring results are also recorded in the SWTS and documented on Form C-38 (Stormwater Turbidity Sampling Report). Forms C-34, C-34a, C-37, and C-38 may be downloaded and printed from the SWTS.

### **RAINFALL JOURNAL**

Daily rainfall amounts are measured using traditional rain gauges or by virtual means. Recorded amounts are rounded and reported to the nearest five hundredths of an inch (0.05") in the Rainfall Journal of the SWTS for each rain gauge. Traditional rain gauge data is entered into the SWTS by the Project Qualified Credentialed Inspector. Rainfall totals from virtual monitoring are entered into the Rainfall Journal of the SWTS by Construction Bureau Personnel. Information found in the Rainfall Journal is in addition to and should match the weather and rainfall entry reported in CAMMS. The Rainfall Journal is printed and added to the Operational Component of the CBMPP at the end of each month.

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### **CREDENTIALS AND TRAINING**

This subtopic describes qualifications, designations, certifications, and licensure that may be required in order to inspect, document, and implement requirements associated with construction stormwater management. These may be dictated internally (by ALDOT), or by state or federal requirements.

## **RESPONSIBLE OFFICIAL**

A Responsible Official (may also be referred to as the Operator) is required to certify inspection reports with the QCP after completion by the Qualified Credentialed Inspector (QCI). The Responsible Official is typically the Region Engineer or a designee under their supervision.

## **QUALIFIED CREDENTIALED PROFESSIONAL**

A QCP is a regulatory designation for a representative of ALDOT or the contractor who, by expertise, experience, and licensure or certification meets the regulatory definition of QCP and may have design or implementation oversight for the construction stormwater-related elements of a construction project.

ALDOT design, implementation, and regulatory compliance processes involve a Design QCP – a professional who directs and supervises the development of the Design Component of the CBMPP; and an Operational QCP – A professional who directs and supervises the implementation of the CBMPP representing ALDOT. A Contractor QCP is a professional representing the contractor who oversees certain specified elements of construction stormwater management when required by contract documents.

After contract award and prior to starting construction the CBMPP moves to an operational stage. ALDOT Area Stormwater Coordinators typically serve as the Operational QCP for projects within their area of responsibility. Design and Operational QCPs representing ALDOT may be State employees or contracted consultants.

There is no mandatory training above that required to achieve and maintain qualifying licensure and certifications. ALDOT allows and encourages QCPs to attend regularly held Qualified Credentialed Inspector training to stay abreast of ALDOT expectations, priorities, and updates to its construction stormwater management programs.

## **QUALIFIED CREDENTIALED INSPECTOR**

A QCI is a representative of ALDOT or the contractor who, by training and documentation meets the regulatory definition of QCI and may provide stormwater-related inspection services on ALDOT construction projects. The ALDOT and Contractor QCI are familiar with the details and requirements of the contract, the CBMPP, including the SWMP and ESCP, and all environmental commitments and regulatory permits, clearances, and authorizations for the project. The Contractor and Contractor QCI communicate with each other and with their respective lines of reporting authority.

QCI credentialing indicates a familiarity with current industry standards for construction stormwater management. It also indicates the ability of an individual to inspect and determine whether or not BMPs have been properly implemented and regularly maintained. QCIs work under the direct supervision of a QCP and may not make modifications to or certify CBMPPs.

QCI credentialing requires an initial training, then subsequent annual recertification training conducted by an ADEM approved Qualified Credentialed Inspection Program administered by an ADEM-approved cooperating training entity.

All personnel responsible for construction stormwater inspections on ALDOT projects, or projects with ALDOT oversight must be credentialed as a QCI. The ALDOT Construction Bureau is an ADEM-approved training entity and conducts annual refresher training for recertification for ALDOT, County, City, and ALDOT Consultant personnel.

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## CONTRACT ADMINISTRATION AND INSPECTION

### ENVIRONMENTAL LAWS AND REGULATION

The type of federal and state agencies involved during construction depend on funding sources and levels and the lead agencies for permitting, authorization, and clearances. Lead agency decisions are made with agency coordination during the environmental planning stages of project development. Federal agency involvement and oversight may be provided by FHWA, US EPA, US Army Corps of Engineers, and the US Fish and Wildlife Service. State environmental regulatory agency involvement is typically limited to ADEM but may also involve other state agencies. The Environmental Construction Engineer conducts most agency coordination after contract letting.

A general understanding of permit requirements may be interesting and helpful for project personnel, but deep intimate knowledge of regulation is not required to ensure contract compliance. Regulatory requirements are incorporated into ALDOT policy, processes, and construction contracts to promote regulatory compliance. In general, if a contractor fulfills the terms of its contract with ALDOT, requirements of environmental regulation are also satisfied.

### APPROACH TO MANAGING CONSTRUCTION STORMWATER RUNOFF

ALDOT incorporates a fundamental approach to managing construction stormwater runoff that includes five key categories of control measures. These categories, or pillars, place effectiveness and economy over mere compliance and prescription. The five pillars of managing construction stormwater include, in order of relative effectiveness and economy: managing communication, managing work, managing water, managing erosion, and managing sediment. ALDOT has experienced that attempting to manage sediment alone is expensive and potentially ineffective. Even when efforts to also manage erosion are incorporated, the results can be less than optimal.

*Managing Communication* includes all efforts to convey information among project stakeholders to increase effectiveness in project planning, design, and implementation. Practices may incorporate written or verbal interaction and operational systems and behaviors to effectively convey necessary information. Examples include contract documents, scheduled and ad-hoc meetings prior to bidding and before and during construction.





*Managing Work* includes all operational efforts to ensure that work proceeds in a manner that is protective of the owner's interests and environmental responsibilities. Practices incorporate prescribed operational practices and selected work methods, sequencing, and scheduling for enhanced water quality protection. Examples include soil disturbance delay and minimization, early installation of cross-drains, and time-based requirements to achieve permanent stabilization.



*Managing Water* includes all efforts that address the flow of waters through the project to protect the work area and minimize the work of managing erosion and sediment. Practices address construction-related surface waters such as runoff, run-on, flow-through, and dewatering effluent. Examples include practices that divert or convey run-on, runoff and flow-through waters to protect them from the introduction of sediment-laden runoff.



*Managing Erosion* includes all efforts to minimize the displacement of soil particles by splash, sheet, rill, and channel erosion to minimize negative project impacts and reduce the work of managing sediment. Practices primarily include those that promote vegetation establishment or reduce runoff velocities. Examples include vegetation preservation and establishment, temporary ground covers, and channel linings.



*Managing Sediment* includes all efforts to influence the transport and deposition of suspended soil particles displaced by erosion. Practices primarily include barriers and impoundments that cause the slowing or temporary ponding of construction site runoff. Examples include sediment barriers, sediment basins, and the application of flocculation agents to stormwater runoff.



## PRECONSTRUCTION ACTIVITIES

ALDOT construction staff, including planned future project staff, should become involved in the design process as early and as often as possible to provide input relevant to construction stormwater management. This may include onsite walk-through meetings and preliminary design and plan review meetings.

Existing conditions and potential environmental concerns should be documented in writing, with photographs and/or video, and included with the project files. The ECS reviews plans for projects that are Priority Construction Sites and those projects with 20 acres or more of disturbance to establish limits of exposed erodible material.

A Prebid Meeting may be held for environmentally sensitive projects to convey environmental commitment and expectations to potential bidders. The Area Stormwater Coordinator uses the Design Component of the CBMPP as the basis for such discussions. All contractor questions and ALDOT responses are documented and provided to all bidders in attendance.

**Onsite Stormwater Meeting.** An Onsite Stormwater Meetings is required prior to soil disturbing activities. During the meeting, the Area Stormwater Coordinator uses Form C-42, Onsite Stormwater Meeting Checklist (described above) as a guide to communicate environmental responsibilities reflected in the contract and CBMPP. All ALDOT-secured permits, clearances, and authorization not previously provided at the Preconstruction Meeting are also provided and discussed during the meeting.

Meeting attendees include ALDOT Region, Area and project staff, contractor representatives, and any subcontractors responsible for clearing, earthwork, vegetation establishment, or construction stormwater management. Additional environmental stakeholders may be invited and include representatives of ADEM, US Army Corps of Engineers, US Fish and Wildlife, and others if deemed necessary or if required by an environmental commitment.

The meeting addresses scheduling and implementation of BMPs and other measures to be taken to ensure and document environmental compliance with the contract. All Stormwater Discharge Points are visited and discussed as well as other potentially environmentally sensitive locations or issues. For Priority Construction Sites, turbidity monitoring and construction stormwater sampling is also be discussed.

## PHASED IMPLEMENTATION

ALDOT Erosion and Sediment Control Plan Sheets graphically represent how construction stormwater runoff is to be managed during three phases of construction. These phases are described below.

1. **Initial Phase** - As clearing begins and prior to any grubbing or grading work. Sometimes referred to as the “Pre-Construction Phase”. Examples include stabilized construction entrances, perimeter barriers, stream protection, temporary sedimentation basins, and vegetated buffers.
2. **Intermediate Phase** - As needed, as work is ongoing and advancing towards completion. Sometimes referred to as the “Construction Phase”. Examples include temporary diversions, ditch checks, sumps, inlet protection (Stages 1 and 2), temporary slope drains, earth berms, and BMPs for designated material stockpiles. This phase may also include BMPs from the previous phase.
3. **Final Phase** - As work is completed and permanent vegetation is established. Sometimes referred to as the “Post Construction Phase”. Examples include inlet protection (Stages 3 and 4), permanent stabilization, and sandbag ditch checks. This phase may also include BMPs from the previous phases.

Due to disturbance limitations and the directive to stabilize disturbances as quickly as possible, work areas progress through each phase of construction individually. One area may be in an intermediate phase, while another is in a final phase, and clearing may not have started in another area. Project managers and inspectors should communicate with the contractor to ensure that appropriate practices are implemented in accordance with the phasing and CBMPP.



## STORMWATER INSPECTION

ALDOT's primary concern related to construction stormwater runoff centers on potential impacts to the quality of receiving waters and adjacent properties. Due to their influence on these potential impacts, the implementation and maintenance of required management practices are also of significant importance.

Project inspectors take an approach of observation and reporting that begins with the location where runoff from the project enters receiving waters or leaves ALDOT rights of way. Any negative impacts noted at these points of discharge are documented and acted upon in accordance with ALDOT policy and inspection practices.

Once the area of discharge has been observed, the inspector moves into the area draining to the discharge point making observations along the way. The inspector assesses the condition of installed practices and ensures that plans are being implemented in accordance with the contract and the CBMPP, including the contractor submitted SWMP. The inspector also looks for areas of potential improvement if necessary. The Five Pillars described above may be helpful in the assessment of contract compliance and the discovery of needs for modification.

**Stormwater Discharge and Background Points.** Locations of stormwater points are described on Form C-34a in the SWTS and are depicted on the Erosion and Sediment Control Plan Sheets. They are selected by the designer and included in the Project Data Form in CPMS. Inaccuracies on Form C-34a noted after contract advertisement are reported to the Area Stormwater Coordinator immediately. For ALDOT projects, all discharge point modification requests are submitted to the State Stormwater Engineer located in the ALDOT Design Bureau.

For Priority Construction Sites, the discharge and background points are also potential locations for construction stormwater turbidity sampling. Discharge and Background Points are located and identified on the Erosion and Sediment Control sheets of the plans and in the field as described below. A graphical example demonstrating naming and numbering conventions is also provided.

**Primary Stormwater Discharge Points** represent locations where channelized construction stormwater or a Water of the State discharges from ALDOT right of way. Primary Stormwater Discharge Points are identified by an integer, which represents the contributing drainage area followed by a zero in the decimal place (example 6.0). Primary Stormwater Discharge Points are identified in the field by a wooden stake marked with flagging and the identification number.

**Secondary Stormwater Discharge Points** represent locations within the ALDOT ROW where channelized construction stormwater discharge enters a Water of the State. Secondary Stormwater Discharge Points are identified by an integer, which is the same as the associated Primary Stormwater Discharge Point, followed by a letter in the decimal place (e.g. 6.A).

**Background Points** represent locations where channelized stormwater run-on, or a Water of the State enters the ALDOT ROW. Background Points are identified by an integer, which is the same as the associated Primary Stormwater Discharge Point, followed by a non-zero number in the decimal place (e.g. - 6.1).

## Construction Stormwater Discharge and Background Points - Example

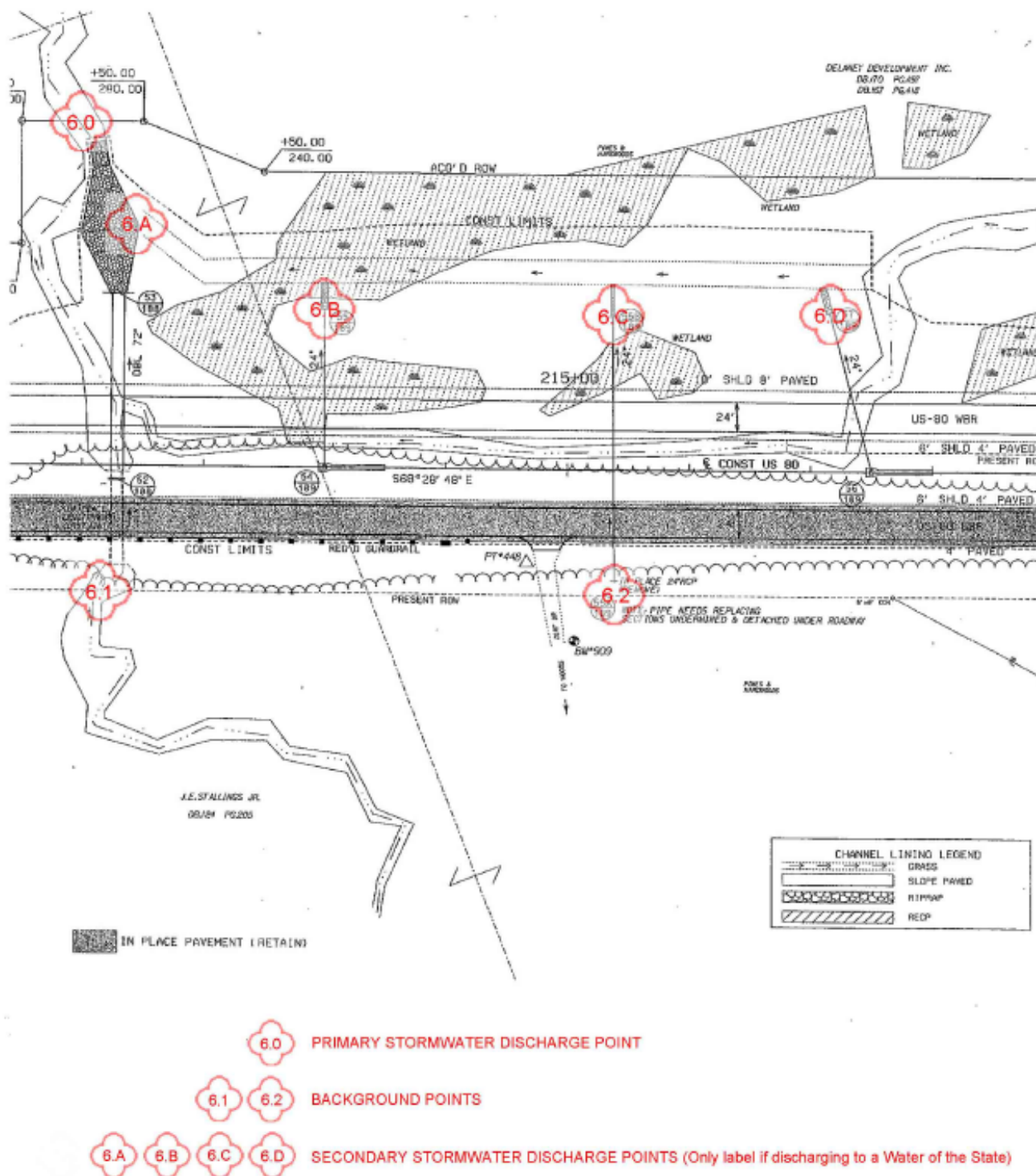


Figure 1.600-1 Discharge and Background Points

**Observation and Inspection Protocol.** Daily Observations are required each day there is activity at the site. Both the contractor QCI and the ALDOT QCI visually observe discharge points and portions of the project where active disturbance or work is present. Weather and rainfall measurements are recorded, and any concerning conditions at discharge points or apparent BMP deficiencies are noted. Documentation of observations are noted in the Daily Work Report in CAMMS. If a previously undocumented Needs Improvement, Turbid Discharge, or Sediment Loss condition is observed, a formal site inspection and report is required.

Formal site inspections are conducted jointly by the ALDOT QCI and the contractor QCI at least once per week and after a qualifying rainfall event. A qualifying rainfall event is defined as the accumulation of  $\frac{3}{4}$  inch of rainfall occurring within 24 hours. Inspections triggered by a rainfall are initiated as soon as possible and within 24 hours of resuming work on the project. Inspection reports are completed and “closed” in the SWTS within 48 hours of the qualifying rain event. Observations and inspections are not to be conducted during unsafe weather conditions or outside of normal operating hours.

Inspection information collected and entered into the SWTS includes assessments of conditions at discharge locations and of implemented and needed practices within each drainage area. Photographic documentation of observations is included with inspection information. At least one photograph is uploaded for each inspection with a clear description of the location and subject captured.

Condition citations available for reporting include *Satisfactory*, *Needs Improvement*, *Turbid Discharge*, and *Sediment Loss*. These citations are described below.

**Satisfactory** – The condition at the discharge point and of the drainage area does not warrant any repairs or improvements. There is no substantial visible contrast observed at any stormwater discharge point. There is no visible evidence of substantial erosion or sediment loss. All BMPs applicable to the current phase of construction have been properly installed or applied; have been maintained and repaired as needed; and are effectively functioning as intended. Sediment may have accumulated immediately upgradient of one or more BMPs, but it has not exceeded  $\frac{1}{3}$  the height or capacity of any BMP. Any previously reported off-site sediment deposition has been remediated.

**Needs Improvement** – The condition of the drainage area needs minor repair or improvement. There is no substantial visible contrast observed at any stormwater discharge point. There is no visible evidence of off-site sediment loss. Minor erosion and on-site sediment loss may be observed. All BMPs applicable to the current phase of construction may not have been installed or applied, or BMPs may have been placed improperly. BMPs may need repair or replacement. BMPs, that have been properly installed or applied may not be effectively functioning as intended and need modification. Sediment may have accumulated immediately upgradient of one or more BMPs and may have exceeded  $\frac{1}{3}$  the height or capacity of a BMP. Any previously reported off-site sediment deposition may have not been remediated.

**Turbid Discharge** – The condition of the drainage area needs repair or improvement. Turbid discharge occurs when turbid construction stormwater leaves the ALDOT ROW and may be observed as a substantial visible contrast at one or more stormwater discharge points. Turbid discharge also occurs when turbid construction stormwater causes an increase of more than 50 NTU in the turbidity level of a Water of the State.

**Sediment Loss** – The condition of the drainage area needs major repair or improvement. Sediment loss occurs when sediment or detached soil particles are transported from the project and deposited beyond the ALDOT ROW or within a Water of the State.

After an inspection report is closed in the SWTS, the Project QCP is notified by email that the inspection report is ready for review and approval. The report is reviewed and approved by the QCP no later than 5 days after the qualifying rain event or after a scheduled inspection report is closed. After review and approval, the Project QCP certifies with signature a printed copy and secures the approval and signature of the Responsible Official. Completed and certified inspection reports are then added to the Operational Component of the CBMPP on file at the project office. A copy is also sent to the Contractor QCI within 15 days of the inspection trigger.

If Needs Improvement is cited, the Project Manager and contractor are immediately notified by the inspector. The Project Manager works with the contractor to create a plan for corrective action. Corrective actions are completed prior to the next storm event and no later than 5 days after the inspection unless prevented by unsafe weather conditions. Corrective actions may require dedication of additional equipment and labor that may necessitate a suspension of all other operations. Additional inspections are performed as needed until the observed deficiency can be documented as corrected, satisfactory, and in compliance with the ADEM permit.

If Turbid Discharge or Sediment Loss is cited, the Project QCP is immediately notified in addition to the Project Manager and contractor. A Turbid Discharge or Sediment Loss condition requires a verbal notification by the Project QCP to the ADEM Field Office within 24 hours of the event and the submission of Form C-37 within 5 days of the event. The verbal notification includes the permit number, county, emergency contact information, and the period of the Turbid Discharge or Sediment Loss condition. The verbal notification requirement for Turbid Discharge conditions may be waived if written approval is given by the ADEM Field Office.

An automatic noncompliance notification is sent to the Construction Bureau, and the appropriate Area Operations Engineer. The Project QCP confirms the duration and frequency of rain events of 2-year intensity or greater associated with a Turbid Discharge or Sediment Loss condition to assess potential “upset” conditions. The event frequency and duration are included in the noncompliance notification.

Upset conditions may be claimed by ALDOT when chronic or catastrophic rain events cause properly implemented and maintained plans and practices to fail. A determination of upset conditions may free ALDOT from potential regulatory enforcement action but does not provide relief from the responsibility of mitigating any damage that may have been caused as a result of the event.

The Project Manager and the Project QCP coordinate with the contractor to create a plan and implement corrective actions when needed to address noncompliance. Corrective actions are completed prior to the next storm event and no later than 5 days after the inspection unless prevented by unsafe weather conditions. When corrective measures cannot be implemented within the 5-day timeframe, written notification and detailed explanation is provided to ADEM. Additional inspections are performed as needed until the observed deficiency is documented as corrected, satisfactory, and in contractual and regulatory compliance.

The Area Stormwater Coordinator communicates and coordinates with the Construction Bureau if deemed necessary. The Construction Bureau coordinates with other ALDOT offices and/or secure the professional services of an independent QCP when deemed necessary. Contact with property owners, environmental advocacy groups, regulatory agencies, and other similar stakeholders is led by the Area Stormwater Coordinator with internal coordination from the Construction Bureau.

For projects with permits held by the contractor or an LPA, inspections are documented using ADEM forms as appropriate. Formal inspections are made available to ADEM in accordance with applicable permit requirements. Copies of all draft reports are provided to the Engineer (as defined by the LPA contract) no later than 24 hours after the inspection, and copies of signed reports are submitted to the Engineer no later than 5 days after the inspection.

## **PRECIPITATION MONITORING**

Traditional rain gauges are utilized on all ALDOT construction sites unless virtual precipitation monitoring (VPM) is authorized and required. VPM provides hyetographs and other storm-specific information that may be helpful when considering upset conditions or other rainfall intensity and volume-based decision-making.

Traditional rain gauges readable to 0.5 inches or smaller unit are placed in open areas to reduce the potential for influence by outside factors such as buildings and trees. Gauge locations and designations are recorded in the Rainfall Journal of the SWTS. Gauges are identified by the letter 'G' followed by an integer corresponding to the Primary Stormwater Discharge Point number of the drainage area in which it is located. Traditional rain gauges are spaced approximately 3 miles apart.

VPM points are identified by the letter 'R' followed by an integer corresponding to the Primary Stormwater Discharge Point number of the drainage area in which it is located. VPM points are located within the project limits and ALDOT ROW.

The Project QCP requests the number and locations of needed VPM points for qualifying projects after the contract is awarded. At least one VPM point is designated for Priority Construction Sites, projects having 20 or more acres of disturbance, or as requested and approved by the Construction Bureau. At minimum, one point is placed at a location to be considered representative of the entire project. Additional points may be added at culvert or bridge sites, or to represent other areas of the project with environmental sensitivities.



The Construction Bureau orders the service and coordinate and administer VPM service contracts. Construction project funding is used for initial set-up fees, monthly monitoring, and other related services. The Project QCP notifies the Construction Bureau when permit coverage is terminated so that the VPM service may also be discontinued.

## **TURBIDITY MONITORING**

Per regulation, ALDOT construction stormwater discharges may not increase the turbidity of receiving waters by more than 50 Nephelometric Turbidity Units (NTUs) or cause a substantial visible contrast. Turbidity monitoring (sampling and testing) is used to document compliance and determine the extent of any noncompliance.

Turbidity monitoring may be required for Priority Construction Sites disturbing more than ten acres, and other projects with increased environmental sensitivities. The Environmental Concerns and Commitments section of the CBMPP indicate if the project is a Priority Construction Site. A Project Note is included in the plans indicating when turbidity monitoring is required. Applicable drainage areas are noted if monitoring is not required for the entire project. When required, monitoring is conducted when a substantial visual contrast is observed and after qualifying rain events.

Both Primary and Secondary Stormwater Discharge and Background Points are potential locations for turbidity monitoring. Monitoring at a Secondary Discharge Point is only required if a substantial visible contrast is observed. All results from turbidity monitoring are recorded on the Stormwater Turbidity Sampling Report in the SWTS.

Requirements for turbidity monitoring may be waived for a drainage area under certain conditions. If sampling and monitoring are not performed as required, one of the following reasons is noted as justification on the Stormwater Turbidity Sampling Report in the SWTS. In all cases, photographic documentation is required.

**Prior to Construction** – Gathering baseline turbidity data is encouraged but not required prior to soil disturbance in any drainage area. This reason may also apply when channelized flow is not present due to a conveyance having not yet been constructed.

**Insufficient Flow** – There must be sufficient channelized flow to collect a stormwater sample. In some cases, there may not be sufficient flow until there is a considerable amount of precipitation. Insufficient Flow describes a condition where a sample of runoff cannot be collected without the sample collection container touching the bottom of the conveyance (ex. ditch bottom, stream bed, pipe, etc.).

**Hazardous Condition** – There may be times when it is not possible to take a stormwater sample at a turbidity monitoring point due to a hazardous condition that may threaten health or safety of the inspector. The details of the hazardous condition are documented on the report.

**Suspension of Monitoring** – Turbidity monitoring continues in a drainage area until the following conditions are met: final required stabilization is installed or applied; erosion is controlled to the



maximum extent practicable; and stormwater sampling results have shown the drainage area to be in compliance for the last two months. When all requirements are met, turbidity monitoring may be suspended in a drainage area. However, if the project has not been accepted for maintenance, turbidity monitoring resumes if the following conditions are true: the drainage area is re-disturbed; there is evidence of substantial erosion; or a substantial visual contrast is observed at a primary or secondary discharge point.

**Monitoring Preparation.** Prior to sampling and analysis for turbidity monitoring, the QCI becomes familiar with proper turbidimeter operation and handling procedures as provided by the equipment's user manual. Equipment is gathered, cleaned, calibrated, and checklists completed before sampling. Equipment necessary for sampling and analysis may include the following -

- ▼ Sample Collection Containers – one-pint minimum volume, polyethylene or glass, wide-mouth container, preferably with a lip designed for pouring
- ▼ Sample Storage Containers – one-pint minimum volume, polyethylene or glass, wide-mouth container, with a secure lid
- ▼ Turbidimeter with calibration kit and test vials or tubes
- ▼ Cleaning Brush(es)
- ▼ Phosphate-Free Detergent
- ▼ Distilled or Deionized Water – gallon jugs for use in the project office
- ▼ Squirt Bottle – fill with distilled or deionized water for use in the field
- ▼ Waterproof Labels – for labeling sample storage containers
- ▼ Waterproof Ink Pens – for labeling sample storage containers

For accurate readings, sample vials and tubes are kept completely clean both inside and out. Sample tubes are handled by the lid and are touched on the glass to the extent possible. Scratched or etched sample tubes are discarded and replaced. Sample storage containers and sample tubes are cleaned prior to each use. Sample collection containers, sample storage containers, and sample tubes are washed after each day of use as follows:

1. Wash with a brush and phosphate-free detergent.
2. Rinse three times with cold tap water.
3. Rinse three times with distilled or deionized water.

The outside of sample tubes are also wiped down with a soft, lint-free cloth. Minor imperfections in the glass may be treated with a light coating of silicone oil applied to the exterior surface and wiped with the cloth to create a thin, even film over the entire surface.

**Sample Collection.** Sampling takes place in the receiving water upstream and downstream of the location of discharge. Downstream samples are taken in the mixing zone of the stream as near to the center of the stream as possible. The mixing zone is a distance of approximately 2.5 – 5 times the width of the stream downstream where there has been reasonable opportunity for dilution and mixture.

If standing in the receiving water is required to take the sample, the sample is taken upstream of the inspector to avoid influencing the turbidity in the sample. Sampling at Primary Stormwater Discharge Points take place before sampling at Secondary Stormwater Discharge Points, then at Background Points for the same reason.

The inside of the sample collection container is rinsed in the water to be sampled prior to each sample collection. During sampling collection, the collection container is held near the base and lowered into the water with the opening downward. Without touching the channel bottom or other submerged structures, the container is plunged into the water 8-12 inches beneath the surface or midway of the total depth for shallower flows. The container opening is turned upstream and lifted to fill the container.

**Sample Analysis.** Collected samples are analyzed in the field using a portable turbidimeter immediately after sample collection. Turbidimeters may be provided by the contractor as a part of the contract. Approved turbidimeters are included on List II-24 “Temporary and Permanent Erosion and Sediment Control Products.” The contractor also provides documentation of current professional equipment calibrations and a field calibration kit (calibration standards, soft lint-free cloth, and silicone oil). Sample tubes or vials are also provided. The QCI verifies and ensures calibration of the turbidimeter prior to sampling analysis.

During analysis the turbidimeter is placed on a level surface and not held by the user. The sample tube is filled with collected water from the collection container. The cap of the sample tube is secured and the tube exterior wiped clean. The turbidimeter manufacturer’s operation instructions are followed to determine the turbidity of the sample.

Results are recorded on the Stormwater Turbidity Sampling Report in the SWTS. Turbidity measurements within the 0-1 NTU range are recorded to two decimal places. Results in the 1-10 NTU range are recorded to the tenth, and those greater than 10 NTU are recoded as whole numbers. Sample tubes may be reused in the field if they are rinsed with distilled water immediately after each analysis.

Sample analysis results exceeding 1,000 NTU require further analysis in the project office. A sample storage container of known volume is filled with collected water. Each sample storage container is identified using a waterproof label with a record in waterproof ink of the project number, sampling point identification number, sample date, sample time, and the name of the QCI who collected the sample. The sample storage container is transported to the project office immediately for analysis. If analysis cannot be conducted within 15 minutes of the sample collection time, the sample must be cooled to 4°C [39.2°F] and can only be held for up to 48 hours.

Prior to analysis, the stormwater sample is agitated by repeatedly inverting the sample storage container to re-suspend any potentially settled particles. The sample is diluted in a larger cleaned container using distilled water until the resulting turbidity reading is below 1,000 NTU. The amount of distilled water used to dilute the sample is recorded. Turbidity of the original sample is calculated by

multiplying the turbidity of the diluted sample ( $T_d$ ) by a dilution factor. The calculation using the equation below.

$$T_s = T_d \left[ \frac{V_s + V_d}{V_s} \right]$$

Where,

$T_s$  = Turbidity of the original sample

$T_d$  = Turbidity of the diluted sample

$V_s$  = Volume of the original sample

$V_d$  = Volume of the dilution added

For example, if 1,250 mL of diluting water are added to 250 mL of an original sample to bring the turbidity of the diluted sample down to 500 NTU, applying the equation results in a 3000 NTU turbidity measurement for the original sample.

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## PROCESS REVIEW AND EVALUATION

### ENVIRONMENTAL COMPLIANCE COORDINATION

Area Stormwater Coordinators facilitate communication and cooperation between local regulators, contractors, ALDOT construction, design, and environmental planning and permitting staff for all environmental matters within their Areas. They communicate environmental responsibilities to ALDOT staff and contractors and ensure regulatory and contractual compliance during preconstruction meetings, onsite stormwater meetings, routine project and inspection reviews. They are responsible for ensuring awareness of issues and potential issues among project, Area, and Region offices, and ECS.

The ALDOT Environmental Construction Engineer supports Area Stormwater Coordinators from the Construction Bureau by providing inspector training and other technical assistance. Assistance may be provided directly and through connection with internal and external subject matter experts. ALDOT bureau and regulatory agency communications regarding issues encountered after contract letting are typically facilitated by the Environmental Construction Engineer. The QCI training program and its regulatory endorsement are also managed by the Environmental Construction Engineer.

### ENVIRONMENTAL PLANNING, DESIGN, AND PERMITTING

The Environmental Technical Section (ETS) of the Design Bureau coordinates all preliminary environmental planning efforts including those required by the National Environmental Protection Act (NEPA) and other environmental laws and regulation. ETS also provides agency coordination and secures Clean Water Act Section 401 and 404 permitting for waters and wetlands impacts, clearances for threatened and endangered species, historical and cultural resources reviews, and air and noise assessments.

The Stormwater Section of the Design Bureau is responsible for ensuring appropriate design of construction and post-construction stormwater management features and practices on project plans. This section is also responsible for ensuring that CGP permit coverage is in place prior to contract letting. Design Bureau staff are available to provide technical assistance before and during construction as subject matter experts.

## **CONSTRUCTION OVERSIGHT**

Contract General Provisions found in the 100 sections of the Standard Specifications for Highway Construction provide many requirements that impact the effectiveness of construction stormwater management. Contract documents communicate specific requirements regarding work quality, sequencing, outcomes, and payment. The Area Construction Office working through the project manager and inspectors has the responsibility and authority to ensure that contract requirements, including those related to environmental commitments are satisfied and that the contract is administered appropriately.

## **QCP SITE EVALUATIONS**

The Project QCP conducts a project evaluation and CBMPP review a minimum of every three months for priority construction sites or every six months for non-priority construction sites. The evaluations are documented on the ALDOT QCP CBMPP evaluation log. A copy of the QCP-completed form C-34 and any associated correspondence are added to the CBMPP.

## **ALDOT CENTRAL OFFICE REVIEWS**

Additional project inspections and CBMPP reviews are conducted by the ALDOT Construction Bureau as needed. Central office reviews are intended to provide technical assistance and contractual and regulatory compliance assurance assistance to area and project staff.

## **UNMANNED AERIAL SYSTEMS PROJECT DOCUMENTATION AND REVIEW**

Certain projects are selected by ECS for condition documentation reviews using unmanned aerial systems (UAS). For those projects selected, the Unmanned Aerial Systems Section of the Maintenance Bureau collect aerial photography and videography pre-, post-, and during construction. Likely chosen projects include the following: grade, drain, base, and pave; bridge and bridge culvert; roundabouts; rest areas and welcome centers; and other projects that may benefit from the service.

Projects are flown at a 6-week frequency unless a different schedule is specified. During each flight, a 360° aerial panorama is flown every 1,000 linear feet within the project limits. Where bridges and/or bridge culverts are located or are being constructed, an orthomosaic is also created. Additionally, photographs are taken upstream and downstream of bridges and bridge culverts.

Images and video are reviewed by ECS post-flight and sent to the Area Stormwater Coordinators with notice of any concerns observed. All issues observed are documented by ECS on a flight review list. All photos, video, and related information and correspondence from these reviews used only for internal purposes. Exceptions may be provided by the State Construction Engineer.

## **MATERIALS MANAGEMENT COORDINATION**

The Environmental Services Section of the Bureau of Materials and Tests provide environmental subject matter experts related to materials management. Materials may be in the form of known and discovered hazardous and non-hazardous materials, and those generated during construction activities. Materials and contaminated areas may include those regulated as superfund sites, above and below-ground storage tanks, lead-based paints, asbestos, etc. The Environmental Construction Engineer typically coordinates involvement of the Environmental Services section during construction.

## **SUMMARY OF ENVIRONMENTAL RESPONSIBILITIES FOR CONSTRUCTION**

**Area Stormwater Coordinator Responsibilities.** The Area Stormwater Coordinator shall be the point of contact for all environmental issues on ALDOT construction projects in his/her Areas. The Area Stormwater Coordinator will attend Pre-Construction Meetings, and he/she will hold meetings quarterly or as needed with Project Personnel and the Contractor. He/she oversees Contractor compliance with the NPDES General Permit; any applicable U.S. Army Corps of Engineers (USACE) Permit and/or U.S. Fish and Wildlife Service (USFW) Clearances; the CBMPP; the ESCP; and the Contractor's SWMP. He/she must possess knowledge of the Contractor's SWMP; the ESCP; the CBMPP; the NPDES General Permit requirements; and if applicable, the requirements of the USACE Permits and/or USFW Clearances. Additionally, the Area Stormwater Coordinator will monitor all construction projects for any issues with environmental commitments or permits. The Area Stormwater Coordinator will notify the Region and Construction Bureau of all significant issues regarding environmental commitments and/or permits, and he/she shall coordinate necessary resolutions. The Area Stormwater Coordinator must also ensure all significant correspondence between the Project and the Area or Subject Matter Experts are relayed to the Region and Construction Bureau. Prior to construction, the Area Stormwater Coordinator shall conduct the onsite stormwater meeting with the Stormwater Meeting Checklist, which includes covering and thoroughly explaining all environmental project notes, any applicable Environmental Commitments, and Permits/Clearances. In addition to distributing the copies of the permits and clearances during bidding, the Area Stormwater Coordinator shall supply copies of said permits and clearances to Contractor Personnel during the meeting. See Specification 107.21(e)3, 108.04(b)6, and 108.04(b)9.

**ALDOT Project Personnel Responsibilities.** Each project is assigned a QCI who monitors the project daily for environmental issues and performs inspections a minimum of once per week. The QCI shall coordinate any environmental issues and meet with the Project Manager and the Area Stormwater Coordinator once per week or as often as needed. QCIs must possess knowledge of the Contractor's SWMP; the ESCP; the CBMPP; the NPDES General Permit requirements; and if applicable, the requirements of the USACE Permits and/or USFW Clearances. See Specification 107.21(e)1,2 and 108.04(b)7b. The Area Construction Engineer (ACE) has the principal authority at the project level. He/she has the authority to suspend projects and authorize remediation due to environmental and regulatory compliance issues. See Specification 108.04(b)1. The ACE shall be responsible for enforcing any applicable Environmental Commitments, permits, and/or clearances during the Pre-Construction Meeting with project and contractor personnel.

**Construction Bureau Responsibilities.** In the Construction Bureau, the Environmental Construction Engineer shall serve as the subject matter expert and be the point of contact for all Area Stormwater Coordinators and environmental related issues. The Engineer will coordinate with the Design Bureau Permitting Section and Environmental Technical Section, which serves as that bureau's subject matter experts and essential personnel until any issue is resolved. The Environmental Construction Engineer shall serve as a Departmental liaison between the Areas and the regulatory agencies.

**Design Bureau Responsibilities.** In the Design Bureau, the Environmental Technical Section (ETS) and Permitting Section house a number of technical experts in specific areas such as USACE permitting; USFW clearances/surveys; archeological and cultural resource assessments; stormwater design, etc. These in-house technical experts will work at the request of the Environmental Construction Engineer to aid Construction Bureau in the resolution of any environmental commitments and/or permitting issues, which may arise during construction of the Departments projects.

**Regulatory Agencies.** The lead regulatory agency and associated agencies such as the Federal Highway Administration (FHWA), USFW, and/or the USACE liaisons shall serve as the points of contacts and subject matter experts for the Department.

**Chain of Command Regarding Environment Regulation.** Any issues regarding environmental regulation during construction shall follow the chain of command from the Contractor to the Area Stormwater Coordinator; to the Environment Construction Engineer; then to the Environmental Technical Section; or directly to the regulatory agency such as the FHWA, USFW, and/or the USACE. Response to environmental regulation issues shall follow the reverse chain of command back to the Contractor to maintain continuity.



## CONTRACT REFERENCES AND RESOURCES

SSHC Reference	SSHC Description
106.01(b)	Clearances and Acknowledgements for the Use of Offsite Areas
106.01(c)	Operation of Offsite Pits and Waste Areas
107.09	Construction Over or Adjacent to Waters of the United States
107.12	Protection and Restoration of Property, Landscape and Utility Facilities
107.13	Woodland Protection (burning), Conservation, Abatement of Water Pollution and Quarantine Regulations
107.14	Responsibility for Damage Claims
107.21	Stormwater Management (property protection, permit coverage, weather prep, inspections, corrective actions)
107.22	Environmental Protection and Spill Prevention
107.23	Temporary Construction Encroachment into Streams, Water Bodies and Wetlands
107.24	Permits for Pesticide Application
108.04(b)	Prosecution of Work (compliance and progress, manufactured products, stormwater management plan, QCP, QCI, soil disturbance limitations, onsite stormwater meeting)
201.03	Clearing and Grubbing
204	Closing Water Wells
205.03	Removal and Relocation of Structures (asbestos, septic tanks)
206.04	Disposal of Materials
210.03	Excavation and Embankment
250.03	Removal of Underground Storage Tanks and Contaminated Soil
521.04	Blast Cleaning, Mechanical Cleaning and Surface Roughness
521.05	Containment System for Removal of Coating from Existing Bridge
521.06	Collection and Disposal of Coating Material Waste from Existing Bridge
521.07	Surface Preparation Plan Submittal for the Removal of Existing Coatings
521.08	Final Cleaning of Blast Cleaned Surfaces
521.14	Worker Protection
524.03(a)2	Water Quality Protection for Culvert Construction
534	Cleaning Existing Drainage Structures
650	Topsoil
652	Ground Preparation, Vegetation Establishment and Mowing
654	Solid Sodding
656	Mulching for Vegetation Establishment
659	Rolled and Hydraulic Erosion Control Products
665	Temporary Soil Erosion and Sediment Control
666	Pest Control
668	Pre-Emergent Herbicide Treatment
669	Post-Emergent Herbicide Treatment
672	Stormwater Turbidity Control (active and passive treatment, flocculant, turbidimeters)

810	Geotextiles
814	Riprap Materials
860.01	<u>Seed</u>
860.03	Mulching Material
860.05	Solid Sod
860.11	Rolled and Hydraulic Erosion Control Products
Drawing Index Number	Drawing Title
65401	SS-654 Sod Terrace Outlets and Sod Flumes
65901	ESC-509 Details of Rolled and Hydraulic Erosion Control Product Installation
66001	RP-660 Details for Planting and Staking
66501	ESC 100-1 Best Management Practice Reference Matrix
66502	ESC-100-2 Best Management Practice Reference Matrix
66505	ESC-200-1 Typical Temporary Erosion/Sediment Control Applications
66506	ESC-200-2 Details of Temporary Slope Drain, Berms and Energy Dissipator
66507	ESC-200-3 Details of Sediment Barrier Applications
66508	ESC-200-4 Details of Silt Fence Installation
66509	ESC-200-5 Details of Sediment Retention Barrier
66512	ESC-300-1 Ditch Check Structures, Typical Applications and Details
66513	ESC-300-2 Details of Hay Bale Ditch Checks
66514	ESC-300-3 Details of Sandbag Ditch Check
66515	ESC-300-4 Details of Erosion Control Wattle Ditch Check
66516	ESC-300-5 Details of Silt Dike Ditch Check
66517	ESC-300-6 Details of Rock Ditch Check
66518	ESC-300-7 Details of Rock Ditch Check with Sump Excavation
66519	ESC-300-8 Details of Silt Fence Ditch Check
66522	ESC-400-1 Inlet Protection Typical Applications and Details
66523	ESC-400-2 Inlet Protection Details for Coarse Aggregate on Grades & Sags
66524	ESC-400-3 Inlet Protection Details of Wattles
66525	ESC-400-4 Inlet Protection Details of Silt Fence
66526	ESC-400-5 Inlet Protection Details of Sand Bag
66529	ESC-501 Floating Basin Boom
66532	ESC-502 Stabilized Construction Entrance
66535	ESC-503 Temporary Dewatering Structures

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66538	ESC-504 Temporary Culvert Stream Crossing
66541	ESC-505 Temporary Stream Diversion
66544	ESC-506-1 Suspended Pipe Diversion (Downstream)
66545	ESC-506-2 Suspended Pipe Diversion (Upstream)
66548	ESC-507 Temporary Sedimentation Basin
67201	ESC-508 Flocculant Usage Guide

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