

**LETTER OF AGREEMENT (LOA) TO IMPLEMENT AN  
EXPEDITED CORRECTIVE ACTION PROGRAM BETWEEN  
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES AND  
DOW CHEMICAL COMPANY – RIVERSIDE  
PEVELY, MISSOURI  
EPA ID# MOD001829852**

**I. GENERAL PROVISIONS**

**A. Purpose**

The Missouri Department of Natural Resources (the department) and The Dow Chemical Company's Pevely, Missouri, site (hereinafter Dow or the Site) are entering into this LOA for the purpose of implementing an Expedited Corrective Action Program (ECAP) at Dow. This LOA describes the roles, responsibilities, and expectations of each party with respect to the activities conducted hereunder.

**B. Definitions**

For purposes of this LOA, the following definitions shall apply:

“Area of Concern (AOC)” means any area at the facility where an actual or potential release of hazardous waste or hazardous constituents, which is not from a solid waste management unit, is occurring and is determined by the department to pose an actual or potential threat to human health or the environment.

“Facility” means all contiguous property under the control of the owner/operator of Dow's Pevely, Missouri, site.

“Hazardous constituent” means any constituent identified in Appendix VIII. of 40 CFR Part 261, as incorporated in 10 CSR 25-4.261.

“Hazardous waste” means any waste, or combination of wastes, as defined by or listed in 10 CSR 25-4, which because of its quantity, concentration, physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or which may pose a threat to the health of humans or other living organisms.

“Release” means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

“Solid Waste Management Unit (SWMU)” means any discernible unit at the facility at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

“Stabilization” means actions to control or abate threats to human health and/or the environment from releases at the Site and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

All other terms used herein shall have the same meaning as those in 10 CSR 25-3, 10 CSR 25-4, 10 CSR 25-5, 10 CSR 25-7, and Section 260.360, RSMo, unless this LOA specifically provides otherwise. Where terms are not defined in the law, the regulations, this LOA, or the U.S. Environmental Protection Agency (EPA) guidance or publications, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific meaning of the term.

### **C. Acknowledgments and Expectations**

The department is seeking to simplify and streamline the process through which the Site addresses corrective action requirements to ensure protection of human health and the environment. By entering into this LOA, the department and the Site agree to work in a cooperative and coordinated manner to ensure successful development and implementation of an ECAP at the Pevely, Missouri, facility and to ensure efficient use of agency and facility resources in addressing corrective action requirements.

The ECAP to be implemented pursuant to this LOA is intended to ensure protection of human health and the environment. The department and Dow believe that timely investigation and/or remediation at the Pevely, Missouri, facility will be of significant benefit in the protection of human health and the environment. The department and Dow also believe that expedited corrective action may be an effective substitute for corrective action performed pursuant to other formal regulatory mechanisms and may be instrumental in assisting and supporting Dow in investigation, cleanup, and/or revitalization of the Pevely, Missouri, facility.

The department and Dow agree that the elements of this LOA are an integral part of the Site’s ECAP and are responsive to the concerns of the department, Dow, the public, EPA, and the regulated community in general; and otherwise meet the corrective action requirements which would be applicable pursuant to a hazardous waste permit or corrective action order.

### **D. Implementation**

Dow agrees to implement an ECAP at the Pevely, Missouri, facility as described in Section II of this LOA. The ECAP shall be designed to identify releases of hazardous

waste and/or hazardous constituents to the environment, investigate the nature and extent of such releases, and, if necessary, implement appropriate corrective measures to protect human health and the environment.

The department will review, provide written comments on, and approve Dow's ECAP deliverables including, but not limited to, investigation work plans and description of current conditions report, evaluations of corrective measures alternatives, and corrective measures implementation reports. The department will utilize applicable EPA and other appropriate technical guidance within the framework of established federal/state regulations and program-specific administrative policies and procedures in reviewing, commenting on, and approving Dow's ECAP deliverables.

The Site agrees to implement ECAP work plans as approved by the department, generally perform work in accordance with the schedule contained in such work plans and document/report substantial deviations from the provisions of approved work plans.

The department will ensure that the Site's ECAP is conducted in an appropriate and timely manner and will ensure that both technical/legal assistance and procedural guidance are available to support and facilitate ECAP activities at the Site. Technical oversight for approved investigation and remediation activities, including field observation, split-sampling, and inspection of final remedies will be provided by the department, as appropriate. The Site shall comply with all applicable environmental laws and regulations as may be necessary in the implementation of the ECAP pursuant to this LOA. These environmental laws and regulations are administered by the department's Air Pollution Control Program, Hazardous Waste Program, Land Reclamation Program, Solid Waste Management Program, and Water Protection Program. It shall be the Site's responsibility to contact the above-referenced programs and to prepare/submit any permit application(s) and/or procure any permit(s) necessitated by implementation of the ECAP pursuant to this LOA. Examples of potentially applicable permits include State Operating Permits issued by the department's Water Protection Program for facility storm water discharges, treatment/discharge of wastewater and/or contaminated groundwater, land disturbance, and underground injection control to facilitate remediation. Potentially applicable permits also include construction and/or operating permits issued by the department's Air Pollution Control Program for remediation activities that result in regulated air discharges.

The department and Dow will, at a minimum, provide opportunities for meaningful public/community involvement in the ECAP process at the time of final remedy selection, should a final remedy prove necessary at the Site. Dow agrees to be responsible for providing public notice and an opportunity for comment for any proposed final remedy for a minimum of 30 calendar days. Additional public/community involvement may be necessary for significant interim or stabilization measures and will be addressed on a

case-by-case basis. The department agrees to review and approve Dow's public notice correspondence prior to publication and be the recipient of and respond to comments, if any, received during the public comment period.

Upon successful completion of all approved ECAP activities as verified by review of the deliverables submitted pursuant to this LOA, any necessary inspections by the department and/or establishment of any necessary institutional and/or engineering controls, the department will issue a Certification of Completion to Dow acknowledging completion of ECAP activities in accordance with the approved work plan(s).

Following issuance of a Certification of Completion to Dow, the department will provide to EPA, Region VII, copies of all approved ECAP work plans/reports and related correspondence, to the extent that EPA, Region VII, has not already received copies of these documents. The department will also transmit a letter to EPA, Region VII, containing the department's recommendation concerning the need, or lack thereof, for further corrective action at the Site. EPA will review the department's recommendation and administrative record for the facility and, based on all relevant information and data, EPA will respond to specific requests for review of the department's corrective action recommendations in accordance with the Facility Management Plan which is negotiated between the department and EPA, Region VII.

Dow agrees to record the department's Certification of Completion as part of the chain of title for the property. In the event that contaminated environmental media containing hazardous waste and/or hazardous constituents remain at the Site, a deed notation or restriction, as appropriate, acknowledging this condition shall be recorded as part of the chain of title for the property. As indicated above, this action shall be completed prior to the department's issuance of a Certification of Completion.

Dow agrees to provide a copy of this LOA and the department's Certification of Completion in their entirety to any potential buyer of the facility along with a notice of any ongoing final remedy maintenance and monitoring requirements (e.g., cap inspection/repair, groundwater sampling and analysis, long-term financial assurance obligations, etc.), engineering controls (e.g., access restrictions, posting of signs) and/or institutional controls (e.g., deed notices/restrictions).

#### **E. Review and Approval**

Following submission of any ECAP plan or report (excluding any progress reports and uninterpreted analytical or other data), the department will review Dow's plan or report. If the plan or report is determined to be adequate, the department will approve the plan or report in writing. If the plan or report is determined to be inadequate, the department will notify Dow in writing of the plan's or report's deficiencies and will contact Dow to schedule a meeting or teleconference to informally discuss/resolve the deficiencies and establish a time frame for submittal of a revised plan or report, if necessary.

If the department determines that deficiencies or issues still exist following review of a revised plan or report, which the department believes will preclude approval, the department will contact Dow to facilitate additional discussions and/or meetings to resolve the remaining deficiencies or issues. The department and Dow believe that in the majority of instances, resolution of any remaining deficiencies or issues may be accomplished in an informal manner. Inasmuch as this LOA is a voluntary agreement between the department and Dow, this LOA does not contain provisions for independent, administrative dispute resolution. In the event that the department and Dow are unable to reach a mutually acceptable resolution within a reasonable timeframe of any remaining deficiencies or issues in an informal manner, this LOA may be terminated by either party in accordance with Section I.H. below.

#### **F. Protectiveness**

All expedited response actions, including stabilization and interim measures activities, shall be protective of human health, welfare, and the environment. These actions shall comply with all applicable federal, state and local laws, regulations, and ordinances. The department will, through oversight of the Site's ECAP activities, determine whether releases to the environment at the facility pose a threat to human health or the environment, and whether mitigation of the potential exposure of human and ecological receptors to such releases is warranted, consistent with applicable federal and state laws and regulations.

If required, remediation shall be consistent with applicable federal and state laws and regulations and shall consider EPA corrective action guidance and the department's corrective action policies and procedures within the framework of established federal/state regulations. Final corrective action remedies shall be based on site-specific conditions and may consider projections of future land use(s) at the Site.

#### **G. Modification**

The department and Dow may revise this LOA at any time to simplify, clarify, and/or modify the specifications contained herein. The department shall keep Dow informed of any proposed modifications of applicable state or federal statutory or regulatory authority that may impact this LOA. Any modification of this LOA shall be mutually agreed to in writing by the department and Dow.

#### **H. Termination of Agreement**

Dow may terminate this LOA at any time for any reason by giving written notice, via certified mail, to the department. The department may terminate this LOA at any time for any reason by providing 30 days written notice via certified mail to Dow. Although the department reserves this LOA termination right, it is acknowledged that such termination would normally be for cause (e.g., failure to implement approved plan(s) or otherwise comply with the terms of this LOA).

## **I. Site Access and Indemnification**

Dow agrees to allow the department access to the Site for purposes of overseeing implementation of ECAP activities including, but not limited to, sampling, conducting investigations related to the extent of contamination, performing remedial action(s), and observing or monitoring the overall progress of the work conducted pursuant to approved ECAP plans.

Dow agrees to hold the department harmless and to indemnify the state of Missouri for any claims including, but not limited to, claims for property damage or personal injury arising from activities of Dow that are reviewed or overseen by the department under this LOA. Notwithstanding, to the extent provided by Missouri law, and in no way to be construed as any waiver or limitation of the doctrines of sovereign, official or governmental immunity, the department agrees to be responsible for its own acts and omissions which may result in property damage, personal injury, and or death in connection with the performance of the terms and conditions of this LOA.

## **J. Reservation of Rights**

This LOA, while intended to assist Dow in meeting applicable corrective action requirements, does not contain terms or conditions which eliminate, reduce, or otherwise impair the department's or EPA's existing authority to require corrective action under applicable state and federal law. This will be the case regardless of whether this LOA is prematurely terminated, or the obligations hereunder are successfully discharged.

The nature and scope of Dow's ECAP is based strictly on information available at the time this LOA is executed. If, prior to or following issuance of a Certification of Completion to Dow, the department or EPA, Region VII, become aware of previously unknown conditions or information which indicates that ECAP activities at the Site are not protective of human health and the environment, the department and EPA, Region VII, reserve the right to take response actions or require additional corrective action as necessary to protect human health and the environment.

The department and EPA, Region VII, reserve any and all rights and authority at all times that they respectively have, including but not limited to, legal, equitable or administrative rights, and authority. This specifically includes the department's authority to conduct, direct, oversee, and/or require response in connection with Dow's ECAP.

Notwithstanding any other provision of this LOA, nothing herein affects or limits the department's or EPA's authority or ability to take any enforcement action required or issue an order by law. Nothing in this LOA limits or affects Dow's right or ability to defend against any such action or order.

Dow reserves and retains all rights, claims, and defenses it has with regard to any enforcement or permitting action by EPA or the department. Dow does not admit any liability or factual allegations contained in this LOA, but agrees not to contest them at this time. Except as provided herein, Dow reserves any and all rights it has under

federal, state, or local law, and regulation to assert defenses and claims against the department, EPA, and/or third parties.

#### **K. Corrective Action Oversight Cost Recovery**

The Missouri Hazardous Waste Management Law at 260.375(30) RSMo, provides that owners/operators of hazardous waste facilities performing corrective action pursuant to Sections 260.350 to 260.430, RSMo, shall pay to the department all reasonable costs, as determined by the Missouri Hazardous Waste Management Commission, incurred by the department in the oversight of corrective action investigations, monitoring, or cleanup of releases of hazardous waste or hazardous constituents at hazardous waste facilities. In general, this oversight includes review of the technical and regulatory aspects of corrective action plans, reports, documents, and associated field activities, including attesting to their accuracy and adequacy.

Corrective action cost recovery billing will be based on the hourly rate(s) of departmental staff performing corrective action oversight multiplied by a fixed factor of 3 1/2. This fixed factor is comprised of direct labor; fringe benefits including, but not limited to, insurance, medical coverage, Social Security, Workers' Compensation and retirement; direct overhead, including, but not limited to, clerical support and supervisory review and Hazardous Waste Program administrative and management support; general overhead, including, but not limited to, utilities, janitorial services, building expenses, supplies, expenses and equipment, and department indirect costs; and other support activities, including, but not limited to, training, peer review, tracking and coordination.

The direct costs associated with travel of departmental staff to the Site for the purpose of corrective action oversight including, but not limited to, expenses incurred for lodging, meals, and mileage based on the rates established by the state of Missouri are recoverable at actual cost. Corrective action-related costs associated with public notification and departmental public hearings, including legal notice costs, media broadcast costs, mailing costs, hearing officer costs, court reporter costs, hearing room costs, and security costs, are also recoverable at actual cost.

Dow's total cost for corrective action oversight will depend on the nature, scope, and complexity of corrective action activities and the corresponding level of departmental oversight required. All funds remitted by Dow pursuant to this LOA will be deposited in the hazardous waste fund created in Section 260.391 RSMo.

## **II. FACILITY-SPECIFIC PROVISIONS**

### **A. The Site Location and Legal Description**

The Site is located at 500 Dow Industrial Drive, Pevely, Missouri. The facility is a 169-acre site located along the Mississippi River approximately one mile east of town of Pevely. The Site is bounded by the Mississippi River on the east, U.S. Route 61 and 67 on the west, Missouri Pacific Railroad on the north, and a jagged southern boundary line averaging 0.4 miles from the northern border. The area immediately surrounding the Dow facility consists of commercial, residential, and recreational uses. Prior to construction of the Riverside facility, land use was predominately agricultural and residential. The eastern and southern portions of the Site are generally wooded, with jogging trails and other recreational facilities for use by employees, or organizations with which employees are involved.

This property does not carry ongoing restrictions as to its use. The property lies within Section 17 and 18 of Township 41N, Range 6E in Jefferson County, Missouri. The geographic coordinates are 38° 17' 02" N latitude and 90° 23' 13" W longitude. The active portion of the site is not subject to 100-year floods. Figure 1 is a copy of the facility map of the Dow property.

Facility operations are presently conducted in two buildings on the northwest portion of the property (Building 11 and 37). The northwest area of the Site is largely covered with buildings (warehouses, maintenance, and office building), roads, and asphalt parking lots.

The eastern portion of the Site, to the east of the Missouri-Illinois railroad tracks, is not fenced. However the Site property does have perimeter fencing and access to the wooded area (eastern portion of the Site) from the Site is via a locked gate in the perimeter fence. Dow has railcar service at the facility. Historically, styrene was offloaded from the railcars into the storage tanks, and was distributed aboveground pipeline to the polymer plant (Building 38).

### **B. The Site's Regulatory Status**

The Site was an interim status hazardous waste treatment storage and disposal facility pursuant to applicable federal and state laws and regulations. The Site is subject to corrective action but is not subject to issuance or reissuance of a Missouri Hazardous Waste Management Facility Permit. Certain wastes and the constituents thereof found at the Site are hazardous wastes or hazardous constituents pursuant to 40 CFR Part 261, as incorporated by reference in 10 CSR 25-4.261(1). In addition, there is sampling data indicating a potential release of hazardous wastes and/or hazardous constituents into the



environment at the Site as indicated by the results of an Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) report (*Final RFA Report for Dow – Riverside Facility, EPA, Region VII, February 16, 1993*).

### **C. Ownership and use of Property**

Dow operates and conducts business in the state of Missouri. The Site was built in 1956 and began operations in 1957 with the production of Styrofoam™ installation. The main business at the facility is the manufacture and shipment of Styrofoam™ and Styron™. The production of these materials is considered a continuous process that includes cutting, printing, and wrapping operations in manufacturing the final product. The styrene is offloaded from the railcars into storage tanks, and sent by aboveground pipeline to the polymer plant (Building 38). Polymerization at the Riverside plant produces polystyrene, which is chopped into pellets (Styron™). A large portion of the Styron™ is shipped off site. The remainder is mixed with powders and eventually extruded as sheets of Styrofoam™. Different mixtures are used to create different types of Styrofoam™. Unless it is contaminated, the scrap Styrofoam™ is ground, liquefied, and re-introduced into the process. Eventually, the styrene becomes enriched in ethylbenzene and shipped to an out-state Dow facility for styrene recovery. Styron™, the product name for polystyrene pellets, is an intermediate product in the production of Styrofoam™ and has been produced since 1975.

### **D. Regulatory History and Previous Investigations/Remediation**

The Site originally operated a RCRA interim status hazardous waste storage unit at the Site. A Part A RCRA permit application was submitted on November 11, 1980. A complete Part B RCRA permit application was submitted on September 1988. Dow decided not to proceed with RCRA permitting and closed the storage area in accordance with the approved interim status closure plan dated September 12, 1994.

The RFA report requested by EPA and generated by Metcalf and Eddy, Inc., on February 16, 1993, as supplemented by review of the Hazardous Waste Program's files for the facility and the interim status closure reports indicate that there are several Solid Waste Management Units (SWMUs) and AOCs that require additional research and/or investigation.

The RFA indicated that Dow contracted Dow Earth Sciences to perform Phase I, II, and III Hydrological Assessments of the facility. Phase I conducted in April 1988 consisted of a literature search relevant to the hydrogeology of the Site area. The Phase II assessment conducted in June 1990 involved the installation of nine temporary wells to measure groundwater levels for determination of gradient. A Phase III study in November 1990 was performed to define the areas of contamination. The result of the phase study that was conducted on May/June 1990 at the Site indicated that some contamination is present in the groundwater and the soil samples.

### E. Scope of Work

Table 1 lists the SWMUs and AOCs identified at the Site from the RFA, as well as descriptions of each of the SWMUs based on the information available at the time in 1993.

**Table 1: Classification of SWMUs According to the RFA and Permit Application**  
*Source: Final RFA Report, EPA, Region VII, February 16, 1993*

SWMU	Description of SWMU
1	<p><u>Styrene/Ethylbenzene Disposal Area-Inactive:</u> According to Dow, between the early 1960s and 1975, a portion of the Site to the east of Missouri-Illinois railroad tracks had been used for the disposal of plant generated wastes containing styrene and ethylbenzene. Approximately 3200 square feet (0.1 acre) has been identified as being underlain by waste materials and contaminated soils.</p>
2	<p><u>Sanitary Landfill #1 - Inactive:</u> Between 1956 and 1981 Dow operated a Sanitary Landfill located west of the Missouri-Illinois Railroad tracks and south of the Missouri-Pacific tracks on the eastern portion of the Site. Based on the measurements from the aerial photographs, this landfill covers an area approximately 650 x 257 ft. Throughout the landfill area, there were scraps of Styrofoam™ and hardened resin fragments scattered through the cover indicating a relatively thin cover. Styrofoam™ scraps, hardened resin, drum lids and rims, and general trash were noted in the depression to the east, between the landfill and railroad, and along the drainage path.</p> <p>Upon closure in 1981, the landfill was covered with a silty clay soil, compacted and graded to drain surface water, and a vegetative covering was placed over the landfill.</p>
3	<p><u>Sanitary Landfill #2 - Removed/Closed:</u> The landfill was located southwest of the production area of the facility. It was operated between 1984 and 1987, and it was closed in 1987 after removal of the refuse. The landfill was graded and seeded for erosion control. The landfill received trash (i.e., lunchroom and office waste, shipping materials, plastics, paper, and wood products).</p>
4	<p><u>Incinerator Area - Removed:</u> The Site operated an incinerator from 1966 to 1971 for the disposal of cardboard, paper, and wood wastes. The incinerator was located outside, near the boiler house (Building 38) and was removed from the property in 1979. According to Dow, this unit did not receive hazardous wastes.</p>

SWMU	Description of SWMU
5	<p><u>Lanair Heater Area – Removed:</u> A resource recovery device was certified for resource recovery (RR-099) from 1984 to 1987 to burn waste oils generated at the facility (May 15, 1984 and December 14, 1987) and thereby provide heat for the parts room of the maintenance building. Less than ten percent of the waste oil generated at the Site during 1984 and 1985 was burned in this unit.</p>
6	<p><u>Dowtherm™ Heater Area - former SWMU:</u> The unit located outside the Polymer Plant (Building 38), in a concrete containment area, and is surrounded on three sides by blow walls due to the risk of explosion. Between 1976 and 1980, a waste stream of feed tar dimers and trimers was mixed with natural gas and burned as part of a mixed fuel system to heat Dowtherm™ A/J inside a closed coil of a Struthers-Wells liquid tube heater. The coil generates the heat used in the polymerization process at Building 38.</p>
7	<p><u>Outside Burn Area - Inactive:</u> This SWMU area described in the report as a depression located east of the facility process area rear gate. It is assumed that cardboard, trash, and wood debris was burned in this SWMU.</p>
8	<p><u>Deraspan Building: Container Storage Area 1 - Active:</u> The hazardous waste storage area is located inside the Deraspan building (Building 34) and has been in use since 1987. It is used for the storage of “full” hazardous waste drums prior to shipment off site for recovery or disposal. The drummed wastes are stored on wooden pallets. The storage area is approximately 60 x 80 ft in size, and the floor is concrete and is diked with an eight-inch high concrete berm.</p>
9	<p><u>Styrofoam™ Warehouse: Container Storage Area 2 – Removed:</u> This storage area was an enclosed area of a proximately 10 x 15 ft located inside Styrofoam™ Warehouse No. 1. It consisted of a drum rack area approximately 10’ wide x 15’ long with a concrete floor. No drums were being stored in this area in December 1987 according to the CEI report, nor were any drums stored there during the visual site inspection. The area was used for storage of toxic (barium) solid waste (D005) only.</p>

<b>SWMU</b>	<b>Description of SWMU</b>
10	<u>Outside Polymer Building: Former Container Storage Area 1-Closed:</u> A third storage area for hazardous waste existed from 1981 to 1986. This former storage area was located outside to the east of the Polymer Finishing building (Building 37). It measured 50' wide x 100' long with a maximum permitted storage capacity of 300 fifty-five gallon drums. The drums were stored on pallets, and ground was reported to have been gravel covered at the time. The area was used for storage of D001 styrene/ethylbenzene waste. Also, F002 spent solvent drums might have been stored in this area.
11	<u>Evaporation Pond - Active:</u> The evaporation pond measuring approximately 35 x 250 ft and 4 ft deep is located southeast of the Production Area. This evaporation pond has been in use since 1974. The pond is used to evaporate sanitary wastewater, clean process area runoff, and non-contact cooling water generated at the facility. Prior to discharge to the evaporation pond, the water in the sumps is tested for the presence of styrene and ethylbenzene. Water samples, collected from the surface of the water in the sump, are analyzed on-site by gas chromatograph. The pond, which is located at a higher elevation relative to adjacent property, operates as a no-discharge system.
12	<u>Safety-Kleen Unit - Active:</u> A 120-gallon Safety-Kleen unit is located in the maintenance building (Building 32). This unit has been in operation since 1988, and contains Stoddard solvent (a.k.a. petroleum naphtha or mineral spirits) used for parts cleaning.

Area Of Concern	Description of AOC
1	<u>Styrene/Ethylbenzene Spill Area</u> : The area is located at the tank farm on the northern portion of the site between Dow's rail spurs and the Missouri-Illinois Railroad tracks. The tank farm is used for storage of ethyl chloride, Freon 142B, styrene, and mineral oil. These materials are received at the Dow facility via railroad tank car. An ethylbenzene unloading area is located on the eastern portion of the tank farm.
2	<u>Polychlorinated biphenyl (PCB) Spill Area</u> : A PCB spill from a small capacitor near the polystyrene production building (Building 38) that involved approximately one pound (1/2 pint) of PCB contaminated fluid occurred June 9, 1990. The spill occurred in a steel electrical cabinet and had minor leakage from the cabinet onto the concrete surface below. The spill was immediately cleaned with muriatic acid and wipe samples were collected. All the four transformers were removed and returned to Union Electric.
3	<u>Unlined Ponds "D"</u> : Two unlined ponds containing liquid are present on the aerial photographs (March 1992) for 1966, and 1974 at the northwestern portion of what is now the Dow property. It is likely that these were sewage lagoons associated with the trailer park, and that they were filled when Dow bought this property around 1976.
4	<u>Unlined Ponds "F" and "K"</u> : A dry, apparently unlined pond is present on the 1966 aerial photograph inside the process area, and is annotated as Pond "F." This pond was located approximately 100 ft west of the site. Pond "K" is identified approximately 200 ft to the north of pond "F" location. Pond "K" is noted as being apparently unlined and containing liquid.
5	<u>Process Area</u> : The aerial photographs indicate that the building now used as Styrofoam Warehouse No. 1 and the northern section of what is now called Building 11 formed the main process building. Apparent styrene/ethylbenzene contamination in the groundwater at the process area.
6	<u>Barge Demolition</u> : Between 1984 and 1986 barges were demolished on a portion of Dow property located on the Mississippi River. A local scrap dealer, Shapiro Brothers, would float the barges onto the beach during periods of high water. When the water level fell, the barges would be cut into scrap. The barges were used only to haul grain and coal.

## F. Description of Current Conditions Report

Dow shall submit a report providing the background information pertinent to the facility, including all data gathered during any previous investigations or inspections to the extent any such investigations or inspections remain available. The report shall include, to the extent known by site personnel:

- A summary of the facility's regional location, all groundwater uses in a one-mile radius of the facility, pertinent boundary features, general facility physiography, and hydrogeology.
  1. Maps depicting the following:
    - a. General geographical location;
    - b. Property lines, with the owners of all adjacent property clearly indicated;
    - c. Topography and surface drainage (with a contour interval of five feet and a scale of one inch = 100 feet) depicting all waterways, wetlands, flood plains, water features, drainage patterns, water wells, and surface water containment areas;
    - d. All tanks, impoundments, buildings, landfills, piles, utilities, paved areas, easements, rights of way, and other features;
    - e. All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;
    - f. All known past solid or hazardous waste treatment, storage, or disposal areas regardless whether they were active after November 19, 1980;
    - g. All known past and present product and waste underground tanks and piping;
    - h. Surrounding land uses (residential, commercial, agricultural, recreational); and
    - i. The location of any production and/or groundwater monitoring wells at the facility and any wells installed off-site by Dow. These wells shall be clearly labeled and ground and top of well casing elevations and construction details included (these elevations and details may be included as an attachment).
  2. All maps shall be consistent with the requirements set forth in 40 CFR 270.14, incorporated by reference in 10 CSR 25-7.270 and be of sufficient detail and accuracy to locate and report all current and future work performed at the Site.
  3. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage, and disposal activities at the facility, including a demonstration of how the waste stream (approximate volume and chemical composition) has changed over time given current knowledge base and documentation reasonably ascertainable.

4. Approximate dates and periods of any past product and/or waste spills or releases to the environment, identification of the materials spilled, the amount released, the location where released, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response, and a map showing approximate locations of release areas at the facility given current knowledge base and documentation reasonably ascertainable.
5. A summary of past environmental permits requested and/or received, any enforcement actions and their subsequent responses, any closure activities that are planned or underway, and a list of corresponding documents and studies prepared for the facility.
6. A summary of all SWMUS and AOCs. This, at a minimum, shall include all regulated units, SWMUs, and other suspected source areas of contamination. For each area, Dow shall identify the following:
  - a. Location of area (which shall be depicted on a facility map);
  - b. Quantities of solid and hazardous wastes released or suspected to have been released (if known);
  - c. Hazardous waste or constituents, to the extent known (including waste analysis data); and
  - d. Identification of areas where additional information is necessary.
7. An assessment and description of the existing degree and extent of the contamination. The assessment shall include, to the extent known or reasonably available to current site personnel:
  - a. All available monitoring data and qualitative information on locations and levels of contamination at the facility (both on-site and off-site);
  - b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
  - c. The potential impact(s) on human health and the environment, including demography, groundwater, and surface water use, and land use.
8. The following information for releases to groundwater (this shall include information previously obtained by the Dow and, if necessary, Dow will research all pertinent public files including, but not limited to files with water resources information located at the offices of the department and the department's Geological Survey and Regional Assessment Division):

- a. Identification of all publicly documented and reasonably ascertainable wells (municipal, domestic, agricultural, industrial, etc.) within a one-half mile radius of the facility, including a summary of the most recent water sampling data available for any identified municipal or domestic supply wells;
- b. A well inventory table that lists the following items for each identified well, to the extent such information is publicly available;
  - Well Designation;
  - State Identification number;
  - Reported owner;
  - Driller;
  - Date of completion;
  - Original use of well;
  - Current use of well;
  - Drilling method;
  - Borehole diameter (inches);
  - Casing diameter (inches);
  - Perforated interval (feet);
  - Gravel pack interval (feet);
  - Total well depth (feet);
  - Depth to water (feet below ground surface);
  - Date of water level measurement;
- c. A regional map showing the facility, groundwater flow direction, and the location of all identified wells within a one mile radius of the facility;
- d. Identification and description of any potential groundwater discharges to surface water bodies;
- e. Identification and listing of all relevant and applicable regulatory water standards for the protection of human health and environment (e.g., maximum contaminant levels water quality standards, etc.);
- f. Identification of all water supply intake points and contact areas within a one- mile radius of the facility. Include a summary of the most recent water sampling data available for each of the identified water supply intake points;
- g. A summary of any available sediment sampling data; and



- h. A regional map showing the facility, surface water flow direction, beneficial reuse areas, and the location of any identified water supply intake points within a one-mile radius of the facility.

### **G. RCRA Facility Investigation**

A RCRA Facility Investigation (RFI) Work Plan is required pursuant to this LOA. This RFI Work Plan shall be designed to: 1) identify any releases of hazardous waste and/or hazardous constituents from the SWMUs and AOCs defined in I.E. above; 2) characterize the nature, vertical and horizontal extent, rate of migration, and any actual or potential receptors of any identified releases; and 3) collect any other pertinent data which may be utilized to substantiate future corrective action investigation and/or remediation decisions.

The content of the RFI Work Plan and resulting RFI Report shall be appropriate for facility-specific conditions and shall be consistent with and address all applicable investigation elements described in the EPA guidance document entitled Interim Final RCRA Facility Investigation Guidance; EPA 530/SW-89-031, May 1989. The RFI Work Plan shall include: 1) a description of current site conditions; 2) all proposed investigation activities and procedures to be conducted at the facility; 3) a schedule for implementing and completing the RFI and submitting a final RFI Report; 4) the qualifications of all personnel, including contractors, performing or directing the investigations, and overall management of the RFI; 5) a Quality Assurance Project Plan which specifies, with respect to the RFI objectives, the sampling procedures, analytical methods, field and laboratory quality control samples, chain-of-custody procedures and data review, validation, and reporting procedures which are designed to achieve the data quality goals of the RFI; and 6) a health and safety plan that assures the RFI activities are conducted in a manner that is protective of human health and the environment.

The RFI Work Plan will be reviewed and approved by the department in accordance with I.E. Dow shall implement the RFI in accordance with the schedule contained in the approved RFI Work Plan.

Due to the complexity of defining the extent of contamination, it may become necessary for Dow to use a phased investigation approach, which may, in turn, necessitate the submittal of a supplemental RFI Work Plan(s) for approval.

During the course of the RFI or other corrective action activities pursuant to this LOA, Dow may discover new SWMUs, AOCs and/or releases from previously-identified SWMUs/AOCs not currently targeted for further corrective action as part of this LOA. The necessity for investigation and/or remediation of any newly-identified SWMUs, AOCs, or release(s) will be evaluated on a case-by-case basis. If any such investigation/remediation proves necessary, Dow is advised that the department will not issue a Certification of Completion to Dow until all necessary work has been completed.

Dow shall submit a RFI Report to the department in accordance with the schedule contained in the approved RFI Work Plan. The RFI Report shall present all information gathered under the approved RFI Work Plan in a form that is consistent with Section 5 of the EPA guidance document entitled Interim Final RCRA Facility Investigation Guidance; EPA 530/SW-89-031, May 1989. The RFI Report shall provide an interpretation of the RFI information gathered, supported with documentation, to enable the department to determine whether further investigation, monitoring, stabilization, a Corrective Measures Study (CMS), and/or a final remedy are necessary.

The RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs/AOCs and associated releases including, as applicable, the following:

- 1) characterization of the nature, concentration(s), horizontal and vertical extent, and direction/rate of movement of releases from SWMUs/AOCs;
- 2) characterization of the environmental setting of the facility including hydrogeological and climatological/meteorological conditions, soil and bedrock characteristics, surface waters and sediment quality, and air quality;
- 3) characterization of SWMUs/AOCs from which releases have been or may be occurring, including unit and waste characteristics;
- 4) descriptions of human and environmental receptors which are, may have been, or, based on site-specific circumstances, could be exposed to release(s) from SWMUs/AOCs;
- 5) information that will assist the department in assessing risks to human health and the environment from releases from SWMUs/AOCs;
- 6) extrapolations of future contaminant movement;
- 7) laboratory, bench-scale, pilot-scale, and/or tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies;
- 8) statistical analyses to aid in the interpretation of data; and
- 9) results of any stabilization measures previously implemented.

The RFI Report will be reviewed and approved by the department in accordance with I.E. If, after review of the RFI Report, the department determines that the objectives of the RFI have not been met, additional investigation may be required. Upon approval of the RFI Report by the department, Dow and the department will meet to discuss and reach agreement concerning the next step in the ECAP process at the Site.

#### **H. Interim/Stabilization Measures**

If, during the course of any activities undertaken pursuant to this LOA, Dow or the department determines that a release or potential release of hazardous waste, including hazardous constituents, may pose a short-term threat to human health or the environment, implementation of interim/stabilization measures may be necessary to slow or stop the further spread of contamination until a final remedy can be implemented. In certain situations, implementation of interim measures may be desirable even though stabilization does not appear to be necessary based on short-term threats posed by an actual or potential release. The necessity for and/or desirability of interim/stabilization

measures and any associated technical (e.g., nature and scope of action) and administrative (e.g., reporting, public participation) requirements will be evaluated on a case-by-case basis and will be discussed by and between the department and Dow.

As indicated under I.D. above, public/community involvement may be necessary for significant interim/stabilization measures. The need for any such involvement will be determined on a case-by-case basis. Any final agreements between the department and Dow with respect to interim and/or stabilization measures and associated actions including, but not limited to, submittal of work plan/reports and scheduling shall be reduced to writing by Dow. This LOA may require modification pursuant to I.G., to incorporate any interim/stabilization measures agreed to by the parties.

### **I. Corrective Measures/Final Remedy**

If, based on the RFI findings and/or other relevant facility-specific information, Dow or the department determines that a release(s) of hazardous waste and/or hazardous constituents presents an actual or potential threat to human health or the environment, a CMS may be necessary. The necessity for a CMS and any associated requirements will be evaluated on a case-by-case basis and will be discussed by and between the department and Dow. If a CMS is required, the department will notify Dow in writing of this decision indicating the hazardous waste and/or hazardous constituent(s) of concern, environmental media of concern, and remedial alternatives to be evaluated by Dow (based on previous discussions with Dow) including any specific alternatives which, in the department's judgment, may be capable of achieving applicable standards for protection of human health and the environment.

A CMS will not necessarily be required for this Site. Dow may propose, in the RFI Report or another LOA deliverable, one or more specific potential remedies for removal, containment and/or treatment of hazardous waste, including hazardous constituents in contaminated media, that are capable of achieving protection of human health and the environment.

Any proposed final remedy, whether presented in the CMS, RFI Report, or another deliverable, shall be consistent with and address the specific remedy evaluation standards and general decision factors contained in Chapter IV of the EPA guidance document entitled RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A and EPA's Subpart S Advance Notice of Proposed Rulemaking, May 1, 1996, 61 FR 19432-19464, as summarized below.

Any proposed final remedy shall present and discuss any interim and/or stabilization measures previously implemented at the Site, including how these measures are consistent with the proposed final remedy and how they addressed the remedy evaluation standards outlined in the following paragraph. Any proposed final remedy shall also include a discussion of other potentially viable remedial alternatives that were

considered, but were dropped from further consideration, including the rationale for elimination.

Any proposed final remedy shall include appropriate technical support and documentation and shall describe in detail, and summarize in a Statement of Basis, how the following remedy evaluation standards are addressed: 1) protection of human health and the environment; 2) attainment of media clean-up standards; 3) control of the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health or the environment; 4) compliance with applicable standards in the management of contaminated environmental media and wastes; and 5) other general remedy decision factors (balancing criteria) including long-term reliability and effectiveness, reduction in contaminant toxicity, mobility and/or volume of wastes, short-term effectiveness, implementability, cost, and community acceptance.

Any proposed final remedy, whether presented in the CMS, RFI Report, or another deliverable, shall specify the scope of work for final remedy implementation by addressing applicable elements of Chapter V. of the EPA guidance document entitled RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A and EPA's Subpart S Advance Notice of Proposed Rulemaking, May 1, 1996, 61 FR 19432-19464.

As indicated above, opportunities for meaningful public/community involvement in the ECAP process will, at a minimum, be necessary at the time of final remedy selection. Dow agrees to be responsible for providing public notice and opportunity for comment for any proposed final remedy for a minimum of 30 calendar days. Dow also agrees to be responsible for establishing and updating, as necessary, a repository (typically the public library closest to the Site) containing the complete corrective action administrative record, as determined by the department, for Dow for public viewing prior to publishing any public notice pursuant to this LOA. The department agrees to make the Site's complete corrective action administrative record available for public review at its offices, approve Dow's public notice correspondence prior to publication, and be the recipient of and respond to comments, if any, received during the public comment period. Following the close of the public comment period, any public comments concerning the proposed final remedy will be addressed by the department in consultation with Dow. Modification of the proposed final remedy in response to public comments, if necessary, shall be accomplished prior to final remedy implementation by Dow including any necessary modification of documents and/or this LOA.

#### **J. Final Remedy Implementation and Completion**

Upon completion of the public comment period for the proposed final remedy, the department's response to any public comments and remedy modification, if any, in response to those comments, Dow may be required to prepare and submit a work plan for final remedy implementation to the extent that other deliverables submitted pursuant to this LOA do not adequately describe the scope of work for the final remedy and the

schedule for remedy implementation. Chapter V. of the EPA guidance document entitled RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A and EPA's Subpart S Advance Notice of Proposed Rulemaking, May 1, 1996, 61 FR 19432-19464, shall be used in developing the site-specific scope of work to be included in the work plan (if required) for final remedy implementation.

The final remedy implementation work plan (or equivalent information in the RFI Report and/or CMS) shall outline the objectives of the final remedy and shall contain, as applicable: 1) a detailed description of the design, construction, operation, monitoring, quality assurance, and maintenance requirements; 2) a cost estimate to define costs for design, construction, operation, maintenance, and monitoring; 3) a schedule for design, construction, and monitoring; and 4) management procedures for hazardous wastes and/or hazardous constituents during implementation of the final remedy.

Should corrective measures for groundwater prove necessary, Dow shall demonstrate that groundwater contamination has not exceeded appropriate regulatory levels (e.g., promulgated standards, maximum contaminant levels, etc.), throughout the identified plume of groundwater contamination for a period of three consecutive years prior to submission of the final remedy implementation report, described below, to document that the final remedy is complete.

In the event that a long-term final remedy (e.g., groundwater pump and treat system with groundwater monitoring) is necessary, financial assurance for final remedy operation, maintenance, and monitoring may be required. The amount of financial assurance will generally be based on the cost estimate contained in the final remedy implementation work plan or equivalent. The need for, timing, and acceptability/use of specific financial assurance instruments or applicability of a financial test will be discussed/negotiated with Dow on a case-by-case basis.

Upon completion of the final remedy (i.e., once the clean-up criteria for all contaminated media have been attained and/or long-term institutional/engineering controls are in place), Dow shall submit a final remedy implementation report to the department. This report shall contain a summary of corrective measures activities conducted at the facility and a detailed description of any long-term operation and maintenance and/or monitoring program associated with the corrective measures. The final remedy implementation report shall be accompanied by a written certification stating that the final remedy has been completed in accordance with the approved work plan(s). This certification shall be signed by Dow and a professional engineer and/or registered geologist licensed/registered in the state of Missouri.

#### **K. Deliverables**

A RFI Work Plan addressing the objectives outlined above shall be submitted by Dow pursuant to this LOA. The necessity for and submission of any other work plans covering investigation, monitoring, interim/stabilization measures, corrective measures

evaluation, and remedy implementation will be discussed with Dow and addressed on a case-by-case basis.

A RFI Report containing the information outlined above shall be submitted by Dow pursuant to this LOA. The necessity for and submission of any other reports covering investigation, monitoring, interim/stabilization measures, corrective measures evaluation, and remedy implementation will be discussed with Dow and addressed on a case-by-case basis. SWMUs and/or AOCs requiring extended time periods for final remedy implementation (e.g., groundwater remediation) may necessitate submission of periodic progress reports which are more detailed than the Quarterly Progress Reports described below. Again, the necessity for and submission of such reports will be discussed with Dow and addressed on a case-by-case basis.

From the time of execution of this LOA until a Certification of Completion has been issued to Dow, Dow shall submit to the department, within 60 days of the end of each calendar quarter, Quarterly Progress Reports summarizing all corrective action activities undertaken during the preceding calendar quarter. The Quarterly Progress Reports shall include the following information: 1) a description of the work completed; 2) summaries of all findings, including summaries of laboratory data; 3) summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify the problems; and 4) deviations from approved work plans or schedules including justification for any delays and a revised projection of the completion date(s), and 5) projected work for the next reporting period. Detailed technical information submitted as part of other deliverables pursuant to this LOA need not be reproduced as part of the Quarterly Progress Reports.

Dow shall submit two copies of all reports, documents, plans, or specifications required under the terms of this LOA to:

Chief, Permits Section  
Missouri Department of Natural Resources  
Hazardous Waste Program  
P.O. Box 176  
1738 East Elm Street (Lower Level)  
Jefferson City, MO 65101 (65102 if use P.O. Box)

Dow shall submit one copy of all reports, documents, plans, or specifications required under the terms of this LOA to:

Chief, RCRA Corrective Action and Permitting Branch  
U.S. Environmental Protection Agency, Region VII  
Air, RCRA, and Toxics Division  
901 North 5<sup>th</sup> Street  
Kansas City, KS 66101

**L. Schedule**

Except as otherwise agreed to and noted in this LOA, Dow shall be allowed to propose, in the work plan(s), reports, and/or other deliverables required by this LOA, its own schedule(s) for conducting the activities hereunder. The department expects that, any schedule(s) proposed by Dow will be of reasonable duration and that once such schedules have been approved, they will be followed. The department does not anticipate formal processing of extension requests. It shall be Dow's responsibility to document deviations from approved schedules in the Quarterly Progress Reports required by II.J. including the justification for the delay and a revised projection of the completion date(s). Failure by Dow to make good faith efforts to meet the self-imposed schedules established pursuant to this LOA may be grounds for termination of this LOA by the department.

This Letter of Agreement has been developed by mutual cooperation and consent by and between:

[Original signed by Earl Pabst for...]

11/22/06

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Daniel R. Schuette  
Director  
Division of Environmental Quality

Date

[Original signed by Timothy King]

10/25/06

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Timothy King  
Remediation Leader  
Union Carbide Corporation  
Under service agreement to The Dow Chemical Company

Date

Figure 1

