

DEVELOPMENT OF THE CONCEPTUAL SITE MODEL

WHAT REGULATORS WANT:
IMPROVED QUALITY OF SITE CHARACTERIZATION
THROUGH EFFECTIVE COMMUNICATION AND THE
CONCEPTUAL SITE MODEL

NEWMOA
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GOALS OF THE CSM

- To establish a rigorous framework for obtaining and presenting information regarding waste site conditions
- To facilitate communication with individuals needing to understand site conditions

WHAT IS A CSM?

- Succinct summary of:
 - source(s)
 - pathway(s)
 - receptor(s)
- Framework for organizing investigation activities and identifying data gaps to be filled
- Graphical and tabular representation of site conditions to support remedial design/action

STAGES

- Preliminary CSM – basis for field investigation design
- Evolving CSM – coherent summary of field data, subject to further refinement as data gaps are identified and addressed
- Final CSM – post-validation basis for remedial design and remedial action

DEVELOPING A PRELIMINARY CSM

- Records review – federal/state regulatory agencies, local building/tax/fire/health departments, historical (Sanborn maps, historical society)
- Interviews – federal/state/municipal officials, former/present site owner/operator, neighbors, former employees
- Database search

DEVELOPING A PRELIMINARY CSM

- Map studies – site plans, Sanborn, topographic
- Prior investigation results/reports (if available)
- Initial site reconnaissance



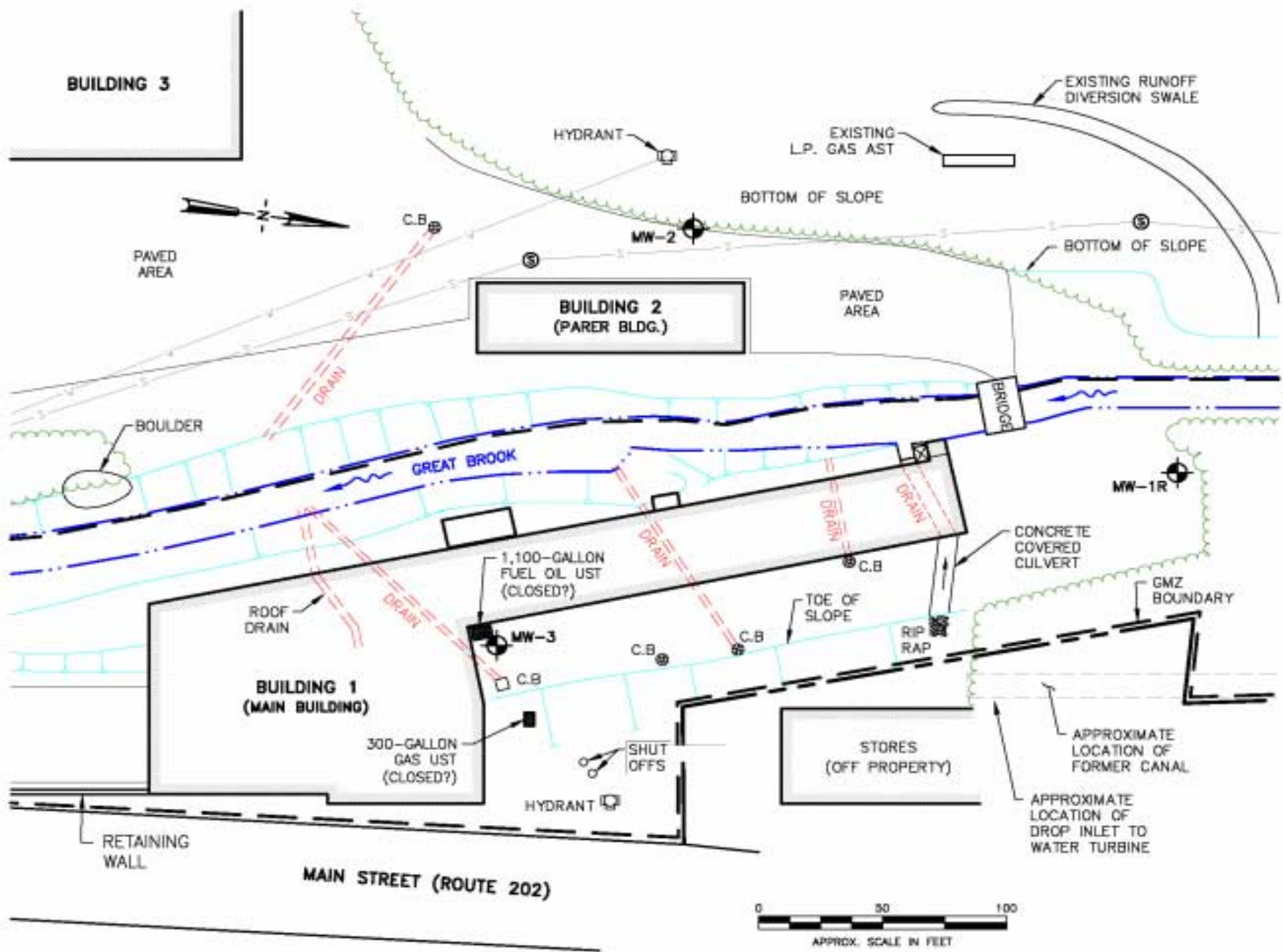
PRELIMINARY CSM

■ Sources

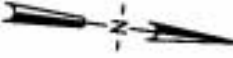
- activity/process history (types/volumes of wastes)
- identified discharge/release mechanisms and locations
- visibly stained/stressed areas
- prior investigation data

■ Pathways

- direct contact (exposed wastes/impacted soil)
- ground water (water supply wells)
- surface water (runoff or ground water discharge)
- air (ambient and indoor)
- utilities (preferential migration)



BUILDING 3



PAVED AREA

HYDRANT

EXISTING L.P. GAS AST

EXISTING RUNOFF DIVERSION SWALE

BOTTOM OF SLOPE

MW-2

C.B.

BOTTOM OF SLOPE

BUILDING 2 (PARER BLDG.)

PAVED AREA

BOULDER

DRAIN

GREAT BROOK

BRIDGE

MW-1R

CONCRETE COVERED CULVERT

GMZ BOUNDARY

1,100-GALLON FUEL OIL UST (CLOSED?)

TOE OF SLOPE

C.B.

DRAIN

DRAIN

DRAIN

C.B.

C.B.

C.B.

C.B.

C.B.

C.B.

C.B.

C.B.

C.B.

C.B.

BUILDING 1 (MAIN BUILDING)

300-GALLON GAS UST (CLOSED?)

SHUT OFFS

HYDRANT

STORES (OFF PROPERTY)

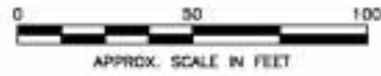
APPROXIMATE LOCATION OF FORMER CANAL

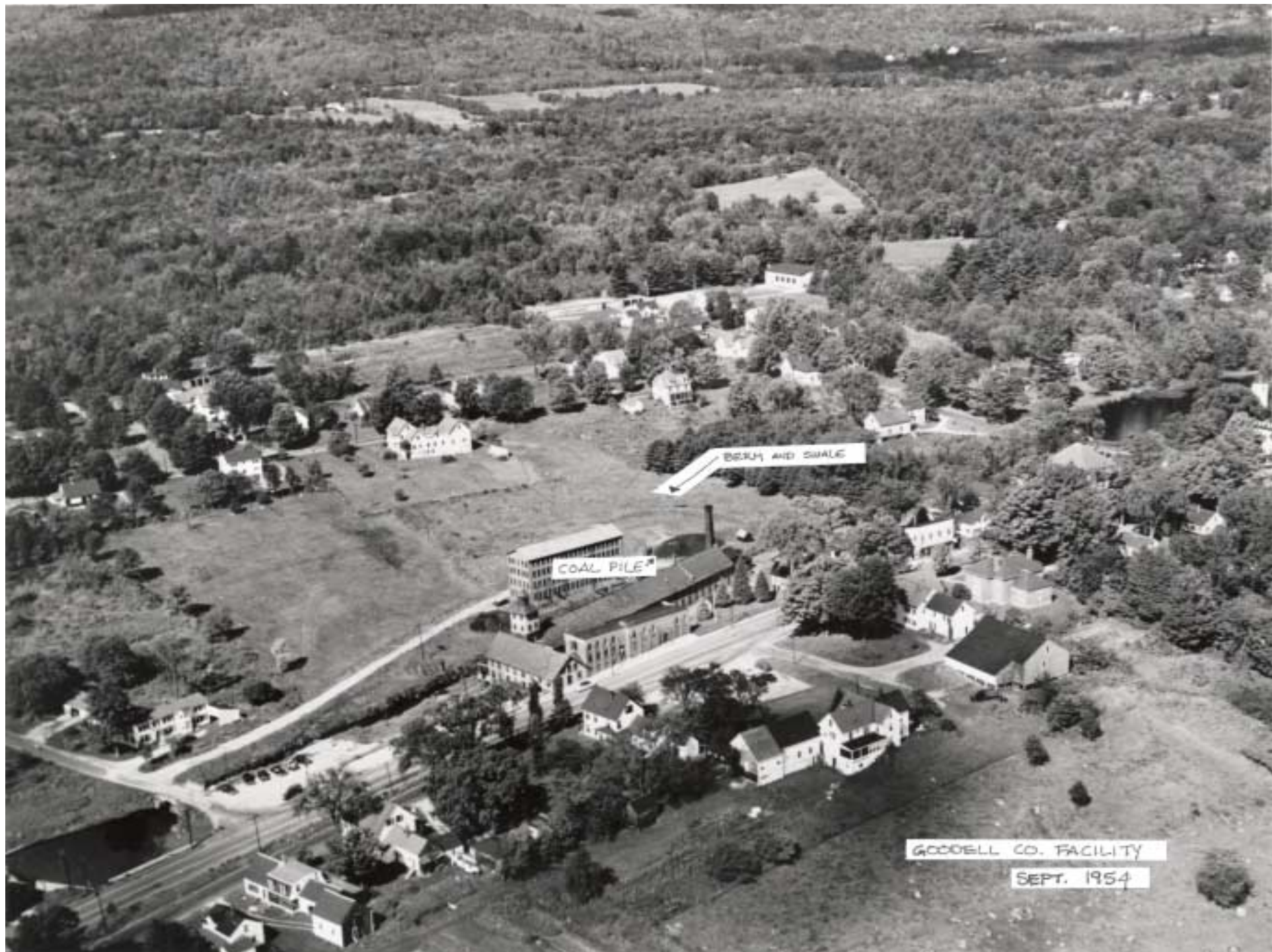
APPROXIMATE LOCATION OF DROP INLET TO WATER TURBINE

ROOF DRAIN

RETAINING WALL

MAIN STREET (ROUTE 202)





COAL PILE

BERM AND SHALE

GOODSELL CO. FACILITY

SEPT. 1954



PRELIMINARY CSM

- Receptors – exposure duration/frequency by pathway
 - Residents (children/adults)
 - Factory workers
 - Construction workers
 - Trespassers
 - Ground water users
 - Aquatic organisms
 - Soil/sediment dwelling organisms
 - Vegetation

CSM → FIELD INVESTIGATION

■ Where do we look?

- Identified/possible release/discharge points
- Identified areas of impact/contamination
- Visibly stained/stressed areas
- Pathways (e.g., ground water, utility trenches)

■ What do we look for?

- Constituents of known process waste streams
- Constituents of waste streams typical of industrial activity
- Degradation products of waste stream constituents
- Constituents previously detected

CSM → FIELD INVESTIGATION

■ How do we do look for it?

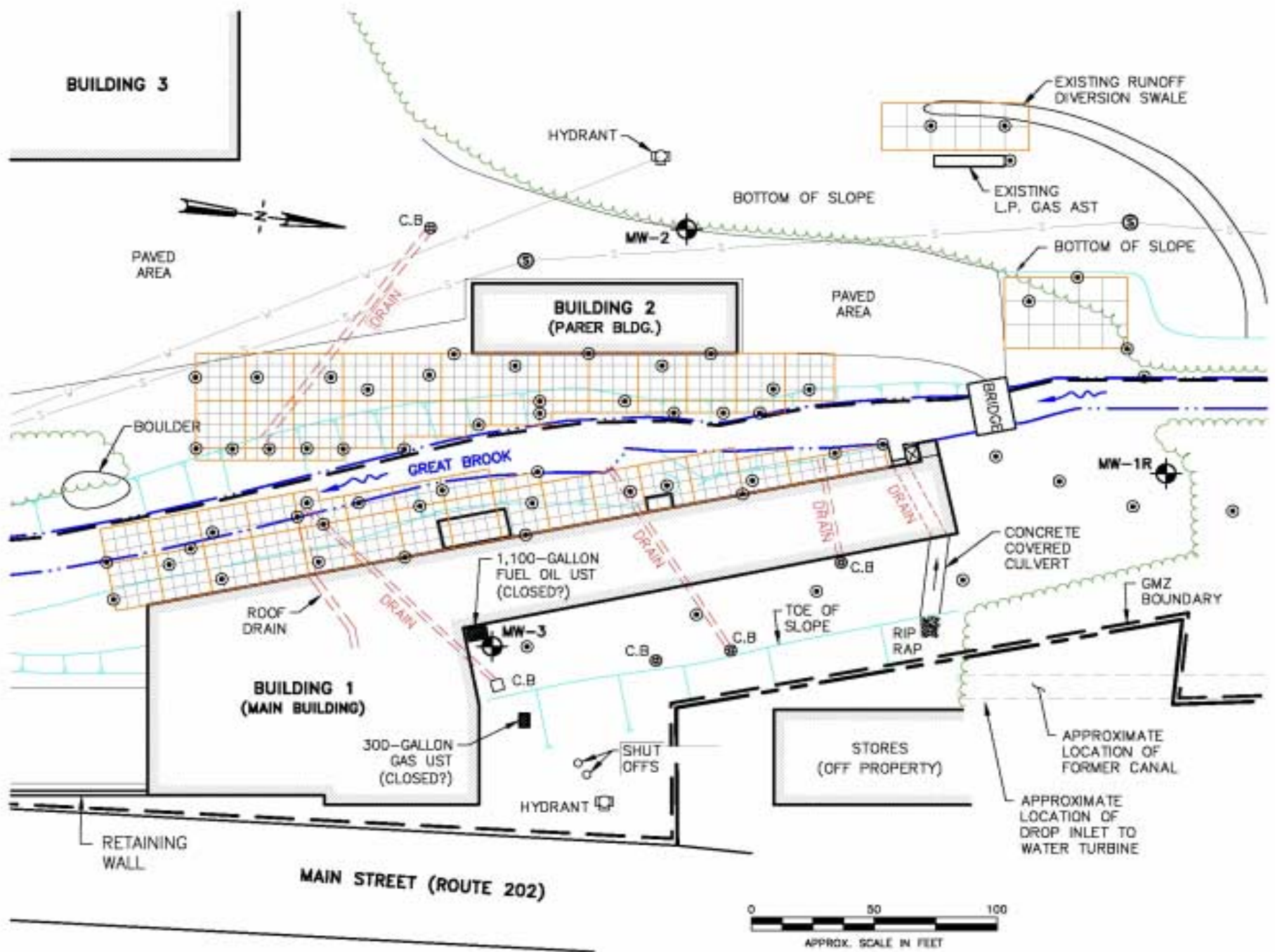
- Intrusive investigation (e.g., test pits, soil borings, direct-push borings, monitoring wells)
- Field analytical methods (e.g., screening instrumentation, portable GC, XRF)
- Laboratory analyses and confirmation

EVOLVING CSM – LET THE DATA LEAD

- Site history/background
- Geology/hydrogeology – illustrated topography, stratigraphy, and ground water flow direction
- Contaminant distribution – tabulated and illustrated for soil, ground water, etc.
- Potential receptors – illustrated locations relative to site
- Data gaps ➔ supplementary investigations

DATA GAPS

- Lateral/vertical limits waste/plume not fully defined => focused sampling
- Ground water flow direction/plume incompletely monitored => augmented monitoring network
- Contaminant distribution suggests another source => additional source characterization
- Previously unidentified utility => possible preferential migration pathway
- Exposure concentrations



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EXISTING L.P. GAS AST

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APPROXIMATE LOCATION OF FORMER CANAL

APPROXIMATE LOCATION OF DROP INLET TO WATER TURBINE

RETAINING WALL

MAIN STREET (ROUTE 202)

0 50 100

APPROX. SCALE IN FEET

REVISED EVOLVING CSM

- New data used to update/revise interim CSM
- Modeling of contaminant fate/transport and receptor exposures