Project CPM Scheduling Fundamentals

October 25, 2017

Presented to:

2017 REGIONAL BUILDING CONSTRUCTION CONFERENCE
by Department of General Services & PMI, Montgomery County Chapter

Presented by:

O'C&L
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Agenda

I. Introduction – Back to Basics

II. Development of the Schedule

III. Basic Scheduling Computations

IV. Practical Applications

V. Delay Analysis

VI. Communicating Complex Analyses To The Non-technical Audience

I. Introduction

- Schedule
  - A plan of procedure listing the sequence of events and the time allotted for each. [1]
  - Time sequence of activities and events. [2]
- Scheduling
  - To make a schedule. [3]

[1] Webster's Dictionary – ISBN 0-345-40095-X
[2] The Contractors' Dictionary – ISBN 0-471-11523-1
[3] Webster's Dictionary – ISBN 0-345-40095-X

I. Introduction

- Planning
  - The process of preparing for the commitment of resources in the most effective fashion.
  - Planning can be thought of as determining “what” is going to be done, “how,” “where,” and by “whom.”
  - In Scheduling, this information is needed in order to determine “when.” [4]

[4] Construction Planning and Scheduling – ISBN 13: 978-0-13-247398-9

I. Introduction

- Estimating
  - To form an approximate judgement regarding the worth, amount, size, etc. [5]
  - "To determine the probable cost of the project, construction estimates are prepared before a project is constructed. Thus, an estimate is, at best, a close approximation of the actual cost." [6]

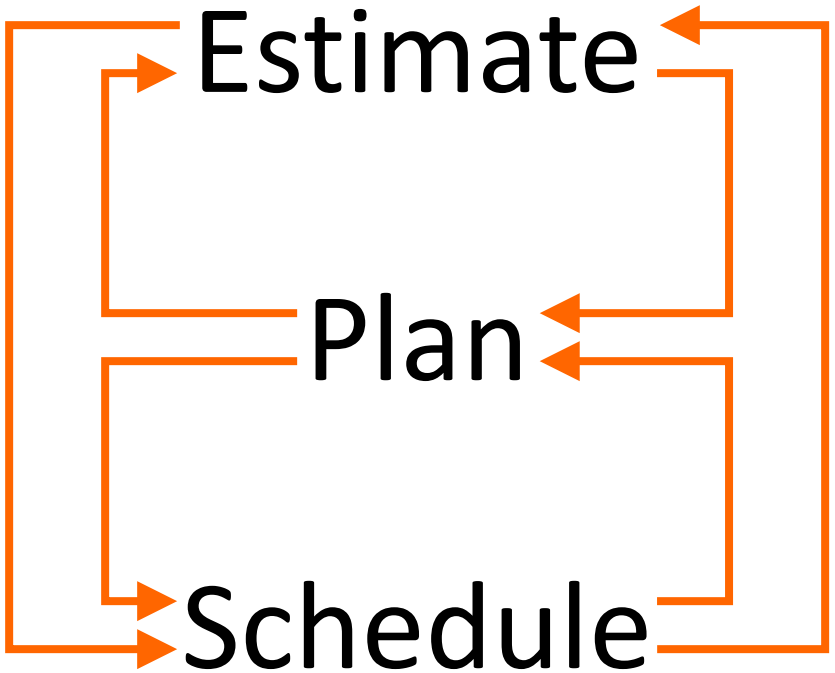
[5] Webster's Dictionary – ISBN 0-345-40095-X
[6] Construction Planning and Scheduling – ISBN 13: 978-0-13-247398-9

I. Introduction

- Estimating
  - "The soundness of the completed estimate depends on the following two factors: (1) the accuracy of the quantity take-off and (2) the judicious selection of the unit costs and production rates to be used." [7]

[7] Construction Planning and Scheduling – ISBN 13: 978-0-13-247398-9

I. Introduction

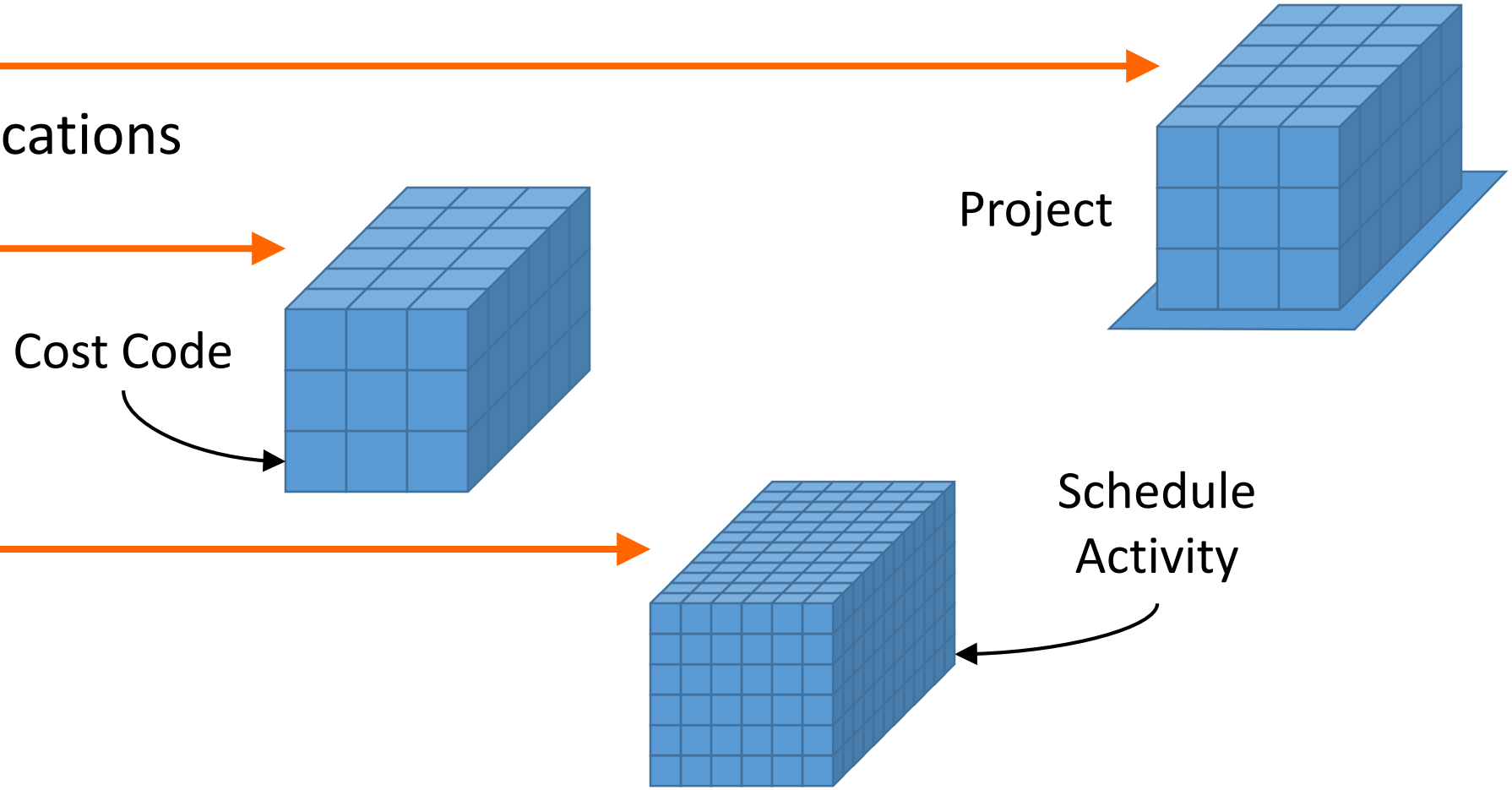


"inextricably related"

"an iterative process"

I. Introduction
Humpty Dumpty Syndrome

- Design
  - Plans and Specifications
- Estimate
- Schedule



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Humpty Dumpty Syndrome

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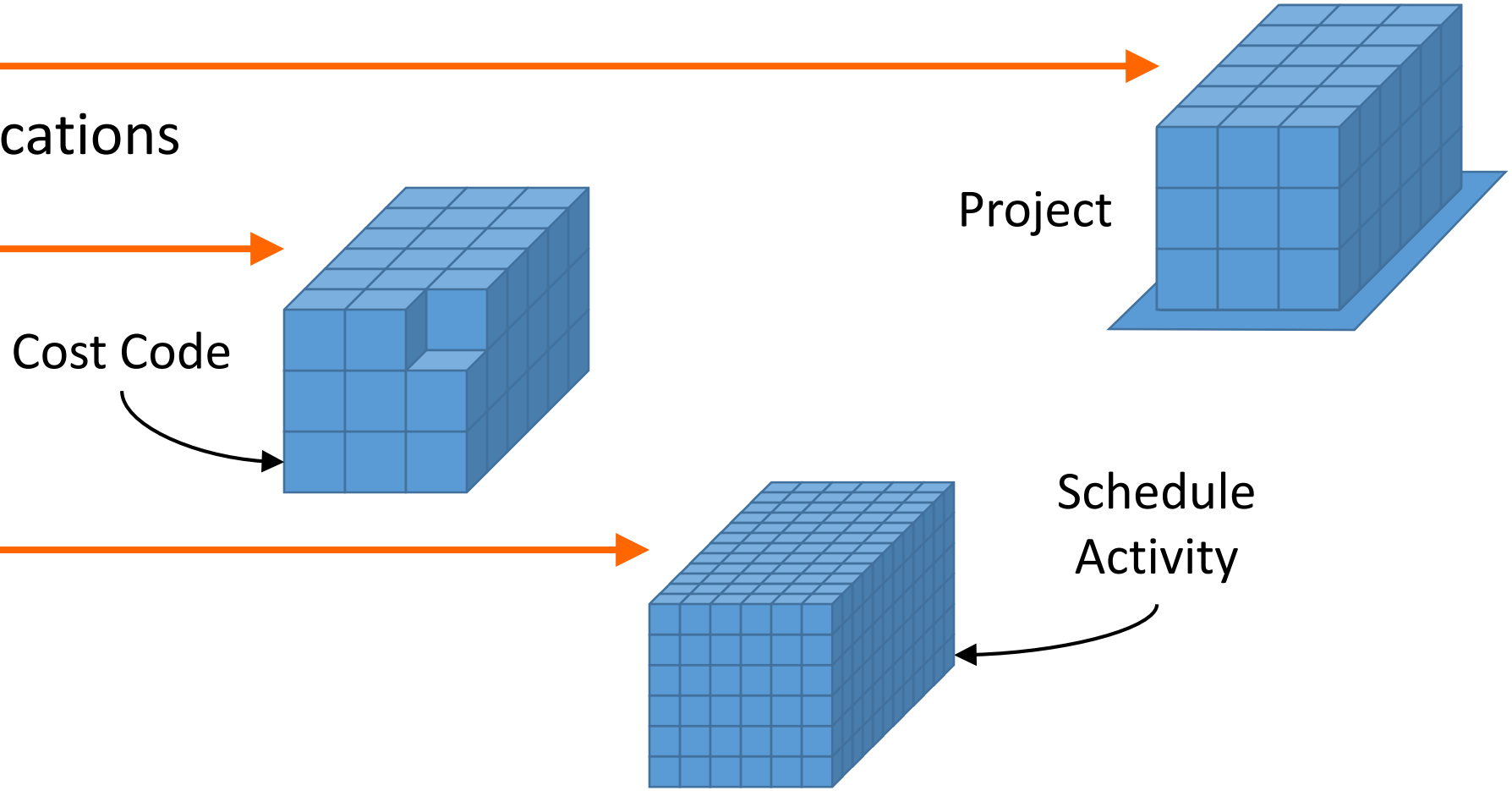

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Humpty Dumpty Syndrome

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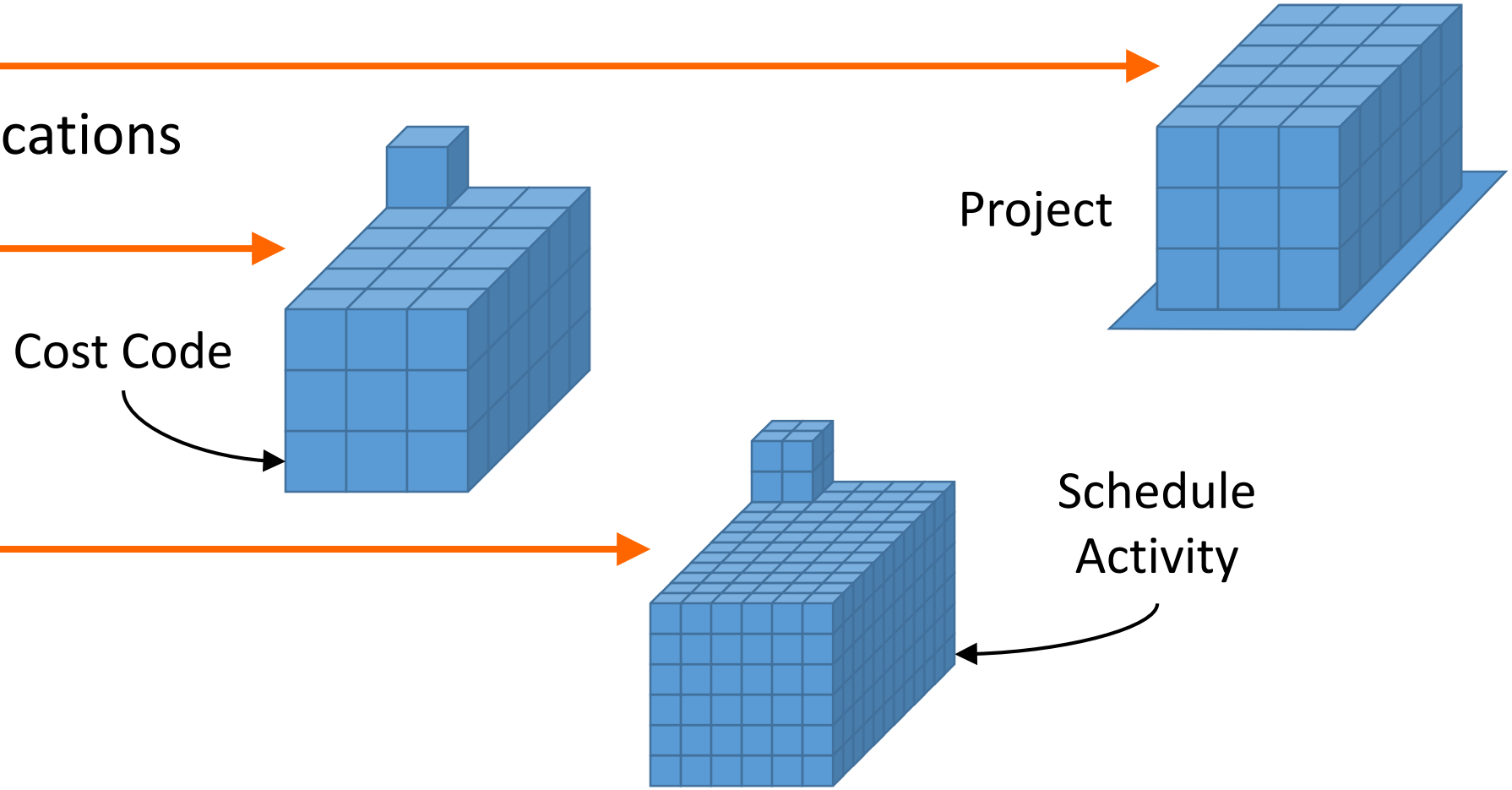


I. Introduction

- Scheduling
- Planning
- Estimating

3 inextricably related terms in Project Management

3 different functions

I. Introduction
The Schedule

- What is the purpose of a Construction Schedule?
  - "When used properly, the project schedule is effective in project management, analysis, control, and overall performance, not just as a device for telling subcontractors where to move their workforces."
  - "Network-Based project management methodology (Schedule) is a dynamic planning and control procedure."

I. Introduction
Basics and Definitions

- Planning and Scheduling
  - Different
  - Distinction in Construction Management/Scheduling
    - Planning – What, how, where, and by whom
    - Scheduling – When
  - Need Planning first to develop a schedule

I. Introduction
Basics and Definitions

- Major objective of project planning
  - Completely define all work required
    - If project well understood, easier to plan
    - Not well understood -> changes in resource allocation, schedule, budget, etc.
    - Risk is scope not well defined at beginning

I. Introduction
Project(s)

- A **project** is a set of tasks or activities related to the achievement of some planned objective, where that planned objective is normally unique.

I. Introduction
Project(s)

Every Project is Unique

I. Introduction Project(s)

- Projects are
  - Finite
  - Complex
  - Homogeneous
  - Non-repetitive

I. Introduction Project(s)

- Finite
  - Specific definable beginning and end point
  - End point = all project goals are met

I. Introduction
Project(s)

- Complex
  - A “non-trivial” number of activities
  - Concurrent/success and uses resources

- Activity
  - A unique unit of the project which can be described within prescribed limits of time.
  - Any portion of a project which consumes resources and has a definable beginning and ending.

I. Introduction Project(s)

- Homogeneous
  - Activities “belong” to the project.

I. Introduction Project(s)

- Non-repetitive
  - Unique

I. Introduction

- Activity
  - A unique unit of the project which can be described within prescribed limits of time.
  - Any portion of a project which consumes resources and has a definable beginning and ending.

I. Introduction

- Types of Activities
  - Production
  - Procurement
  - Management Decisions

I. Introduction

- Responsibility for Activities
  - Contractor
  - Owner
  - Designer
  - 3rd Party

I. Introduction

- Critical Path
  - Many definitions…most are incomplete.
  - The critical path is the _____ path to a point in the Schedule (usually the end).
    - Shortest?
    - Longest?

longest

I. Introduction
Historical Development of Construction Schedules

- Early forms of scheduling date back over 3000 years to the construction of Egyptian pyramids.
- 1765: Joseph Priestley first developed the bar chart to plot the lifetimes of various famous people.
- 1759-1823: William Playfair is the first to develop a range of statistical charts including line, bar, and pie charts.
- 1896: Polish researcher Karol Adamiecki developed the Harmonygraph (Harmonogram).

I. Introduction
Historical Development of Construction Schedules

- 1910's: Henry L. Gantt developed the Gantt Chart.
  - Similar to the Harmonygraph, but more accessible and versatile
- 1950's: Network-Based Scheduling Methodologies.
  - 3 Developments
    - Central Electricity Generating Board, Great Britain (1957-1960)
    - Polaris Missile Project (1958)
    - DuPont Company (1956-1959)

I. Introduction

- CPM: Critical Path Method
  - Developed by DuPont & Remington Rand Univac
  - Activity durations are “fixed” / “deterministic”
  - Objective to determine how best to reduce the time required to perform plant overhaul

I. Introduction

Network

- CPM: Critical Path Method
  - Involves both a graphical portrayal of the interrelationships among the elements of a project (activities), and an arithmetic procedure which identifies the relative importance of each element (activity) in the overall schedule.
  - "Importance" with respect to timely completion.

I. Introduction

- PERT: Program Evaluation and Review Technique
  - Developed by US Navy & Booz Allen Hamilton
  - Includes uncertainty in calculations (optimistic time, pessimistic time, and mostly likely time)
  - Developed for schedules contacting activities with uncertain durations
  - Probabilistic method
  - Requires more technical understanding than CPM

I. Introduction

- Construction Industry
  - Utilizes CPM almost exclusively
  - Recent trends towards risk analysis in CPM

I. Introduction

- Historical Development of Construction Schedules
  - Three “Generations”

I. Introduction

- Generation 1
  - Bar Charts
  - Harmonygraphs
  - Intuition/Experience 1950
- Generation 2
  - Network Based Schedule Methods
  - Graphical and Mathematical Procedure 1990
- Generation 3
  - Expansion of Logic

I. Introduction

- Elements of a Construction Schedule
  - Activities
  - and how they are connected → **Logic**

I. Introduction

- Fundamental Activity Attributes
  - Description – Name that provides insight into scope/location.
  - Activity ID – Used by computer to recognize activities.
  - Duration – An estimate of the time required to complete the scope of work included in the activity.
  - Logic – Defines the relationship between/among the activities.
  - Float

I. Introduction

- Float
  - What is float?
    - Measure of that “relative importance” discussed earlier.
    - Measure of an Activity’s flexibility with respect to when it is performed.
    - More later…

I. Introduction

- Logic
  - Simple Precedence
    - What has to be completed before the Activity can start?
      - Predecessor(s)
    - What activities can not start until the Activity is finished?
      - Successor(s)

I. Introduction

I. Introduction

- Network-Based Schedules (CPM)
  - Consists of 2 main components

1. Network – a graphical portrayal of the plan for carrying out the work (schedule) showing the dependency relationship among the project activities.

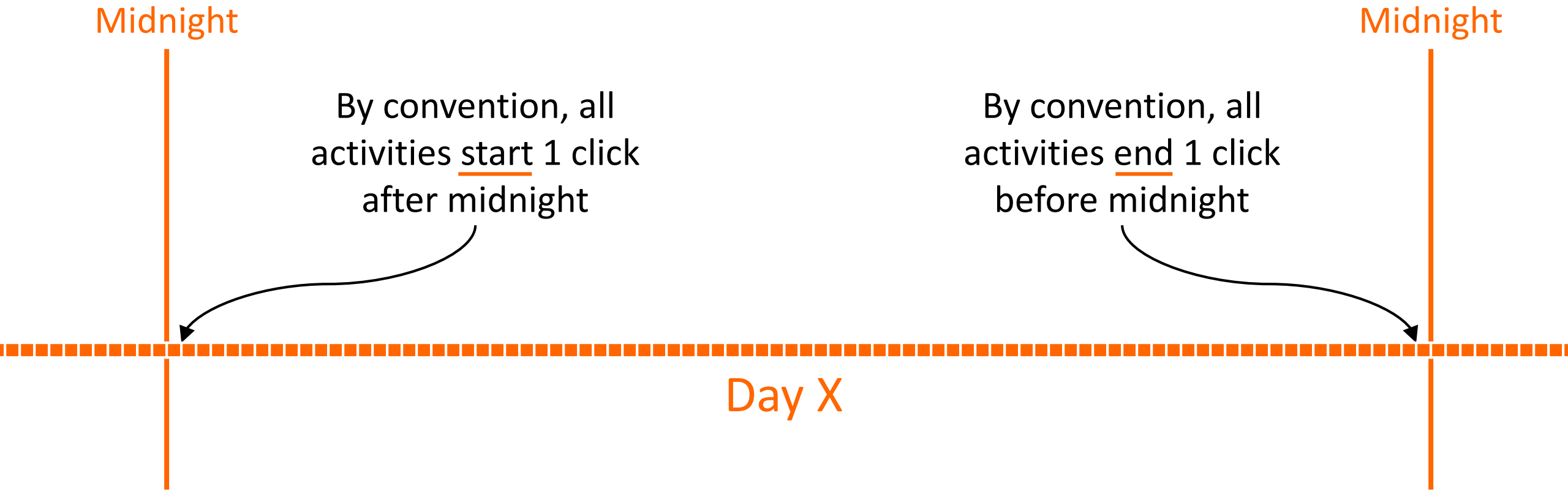
2. Arithmetic Procedure (Scheduling Computations) – an algorithm is applied, based on network logic, to determine how long the project is expected to take and when each activity may be scheduled.

I. Introduction

- Software
  - Microsoft Project
  - Primavera – By Oracle (P6 Professional)*

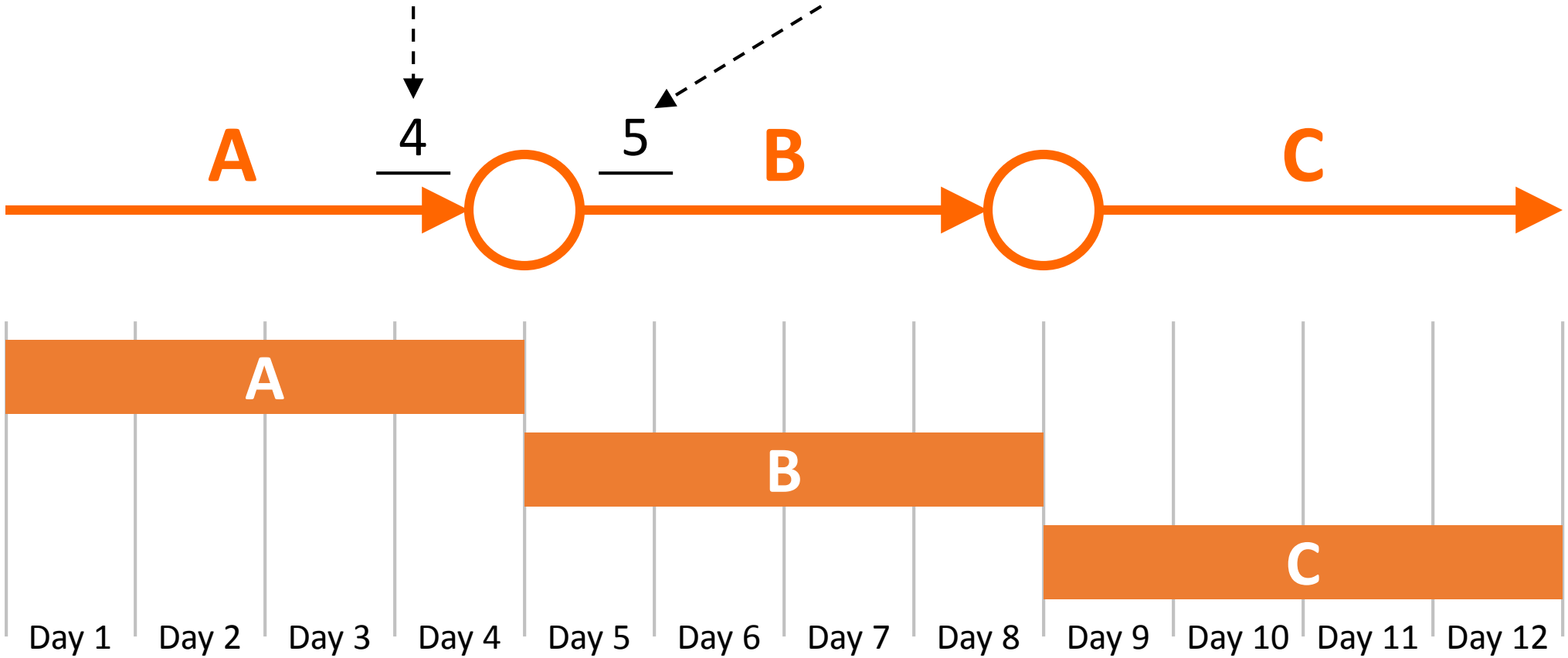
I. Introduction

- Primavera Conventions



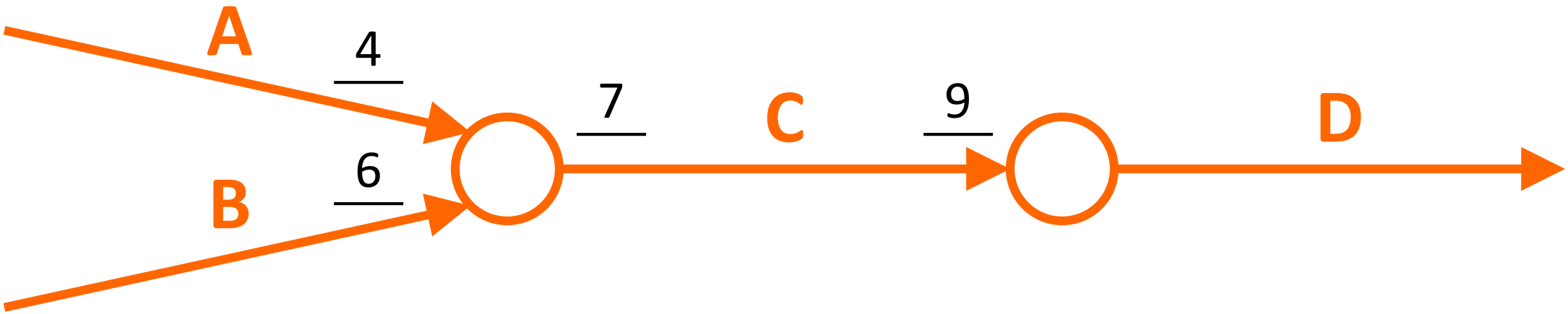
I. Introduction

- If A ends on day 4, when can B start?



I. Introduction

- When can C start?



- If C's duration is 3 days, when will C finish?

I. Introduction

- Arithmetic Procedure
  - Forward Pass
    - Beginning at a specified project start time, proceed sequentially from the beginning to the end of the project giving the earliest (expected) start and finish times for each activity.
  - Backward Pass
    - Beginning at the end of the project, proceed sequentially from the end to the beginning of the project giving the latest allowable start and finish times for each activity. [8]

[8] Project Management with CPM, PERT and Precedence Diagraming – ISBN 0-960-63448-7

I. Introduction

- The Forward Pass answers the question:
  - When can this activity start? (earliest time)
- The Backward Pass answers the question:
  - When must this activity finish? (latest time)

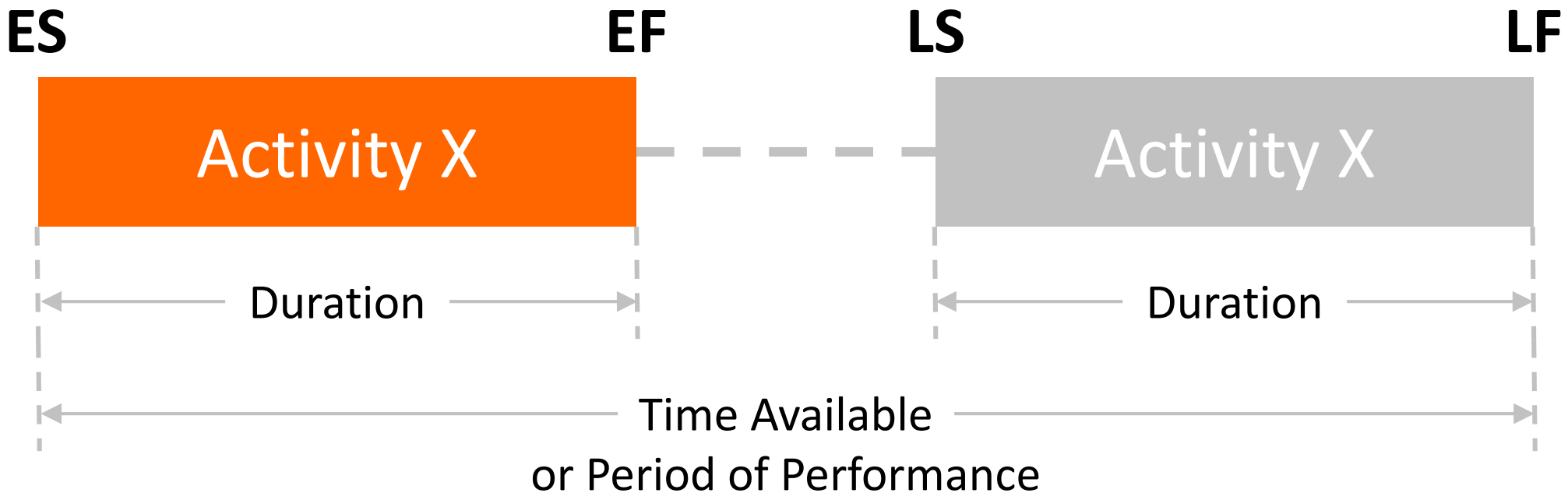
I. Introduction

- Forward Pass
  - Early Start (ES)
  - Early Finish (EF)
  - Project Duration
- Backward Pass
  - Late Start (LS)
  - Late Finish (LF)
  - Float

Critical Path

I. Introduction

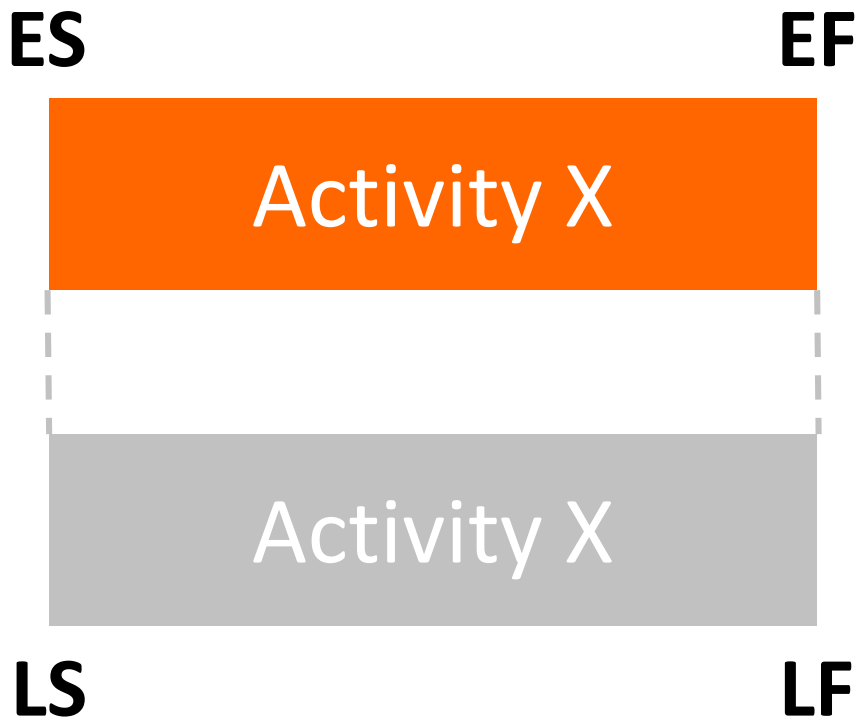
- The Four (4) Activity Times



- Float = LS-ES or LF-EF

I. Introduction

- What if?



- Float = 0

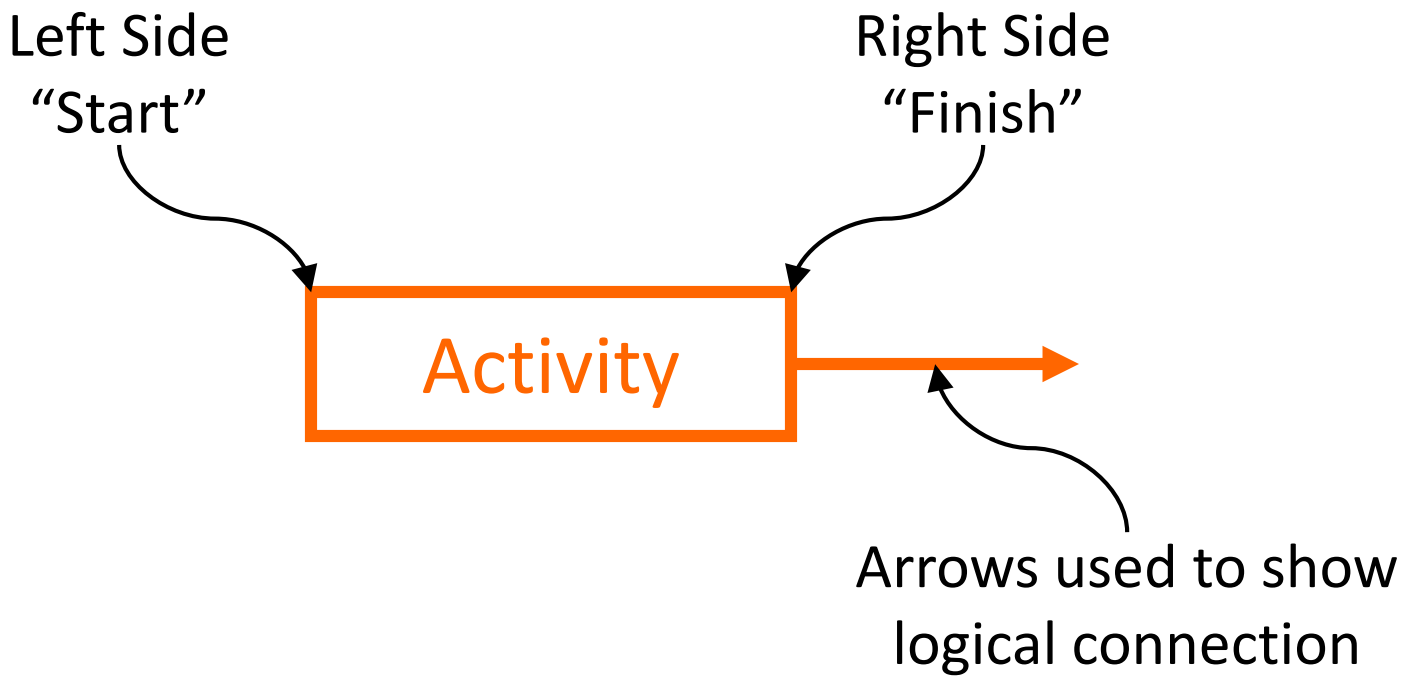
I. Introduction

- Generation 3 – Network Based Schedules (CPM)
  - The real world, today
  - Graphic
    - Utilizes Activity-On-Node Diagrams

  - Arithmetic Procedure
    - Based on enhanced logic

I. Introduction

- Primavera Conventions



I. Introduction

- Primavera Convention

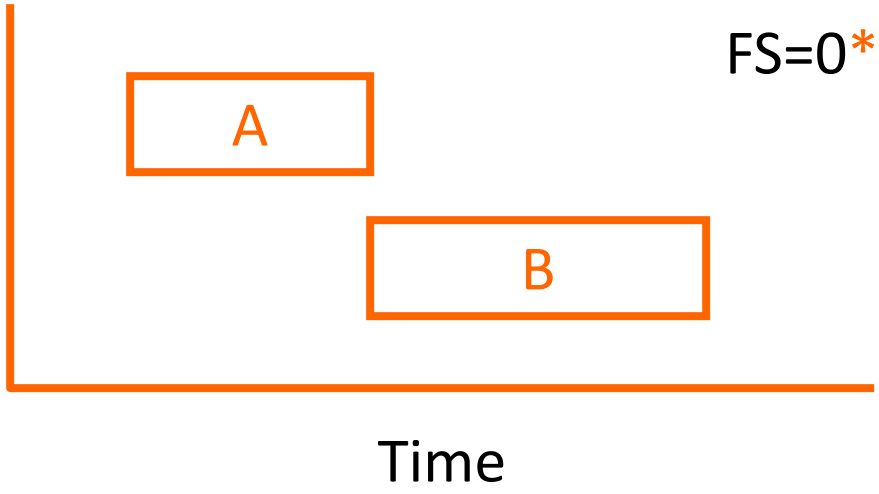
I. Introduction

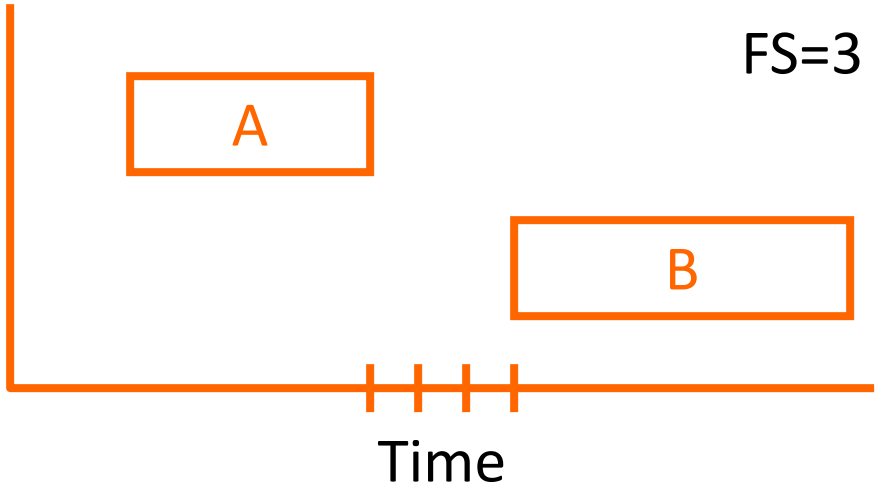
- Generation 3
  - Enhanced / Additional Logic
    - Finish-Start (FS) (simple precedence – 1st generation)
    - Start-Start (SS)
    - Finish-Finish (FF)

    - Lag

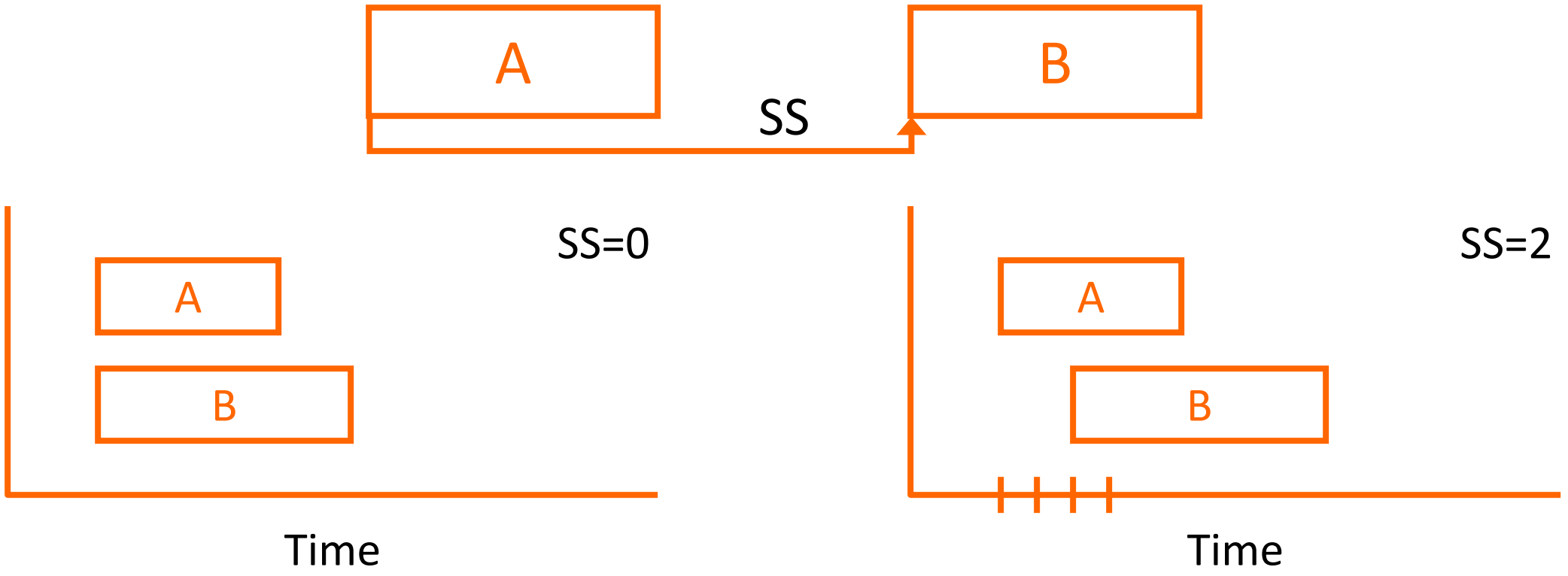
I. Introduction

* Simple Precedence

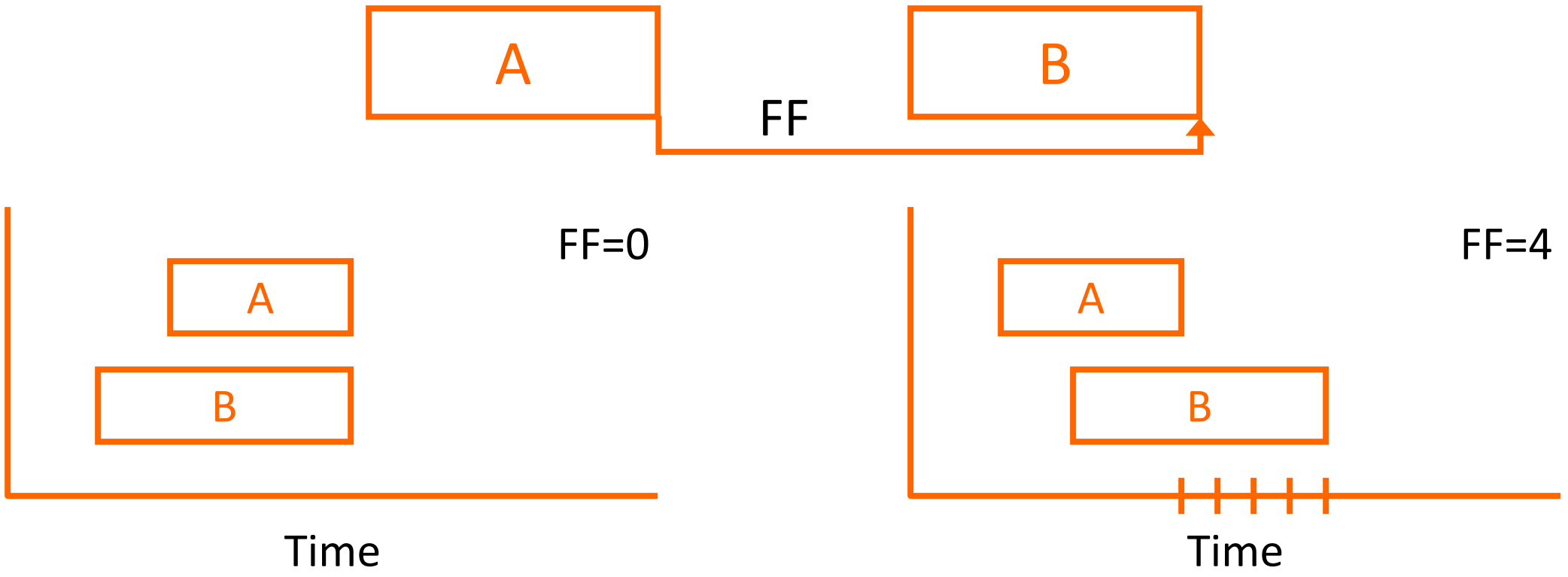




I. Introduction



I. Introduction



I. Introduction

- Categories of Schedules
  - As-Planned (aka. Baseline or Initial)
  - Updated
  - Refined
  - “As-Built”

I. Introduction

- A CPM Construction Schedule is a model of how the project is planned to be built.

- “Project is to be constructed in accordance with the Schedule.”

II. Development of the Schedule

II. Development of the Schedule

- Identify Contractual Requirements (e.g., required finish date)
- Break the project down into activities (Activity List)
- Develop Logic between/among activities
  - Determine Predecessors/Successors
  - Determine relationship types
  - Determine lag values
- Develop Network

II. Development of the Schedule

- Estimate Original Durations (based on Planning/Estimating Assumptions)
- Add durations to Network (Network + Durations = Schedule)
- Perform Scheduling Computations
  - Forward Pass
  - Backward Pass
- Time/Cost Tradeoff (iterative process to meet contractual requirements)

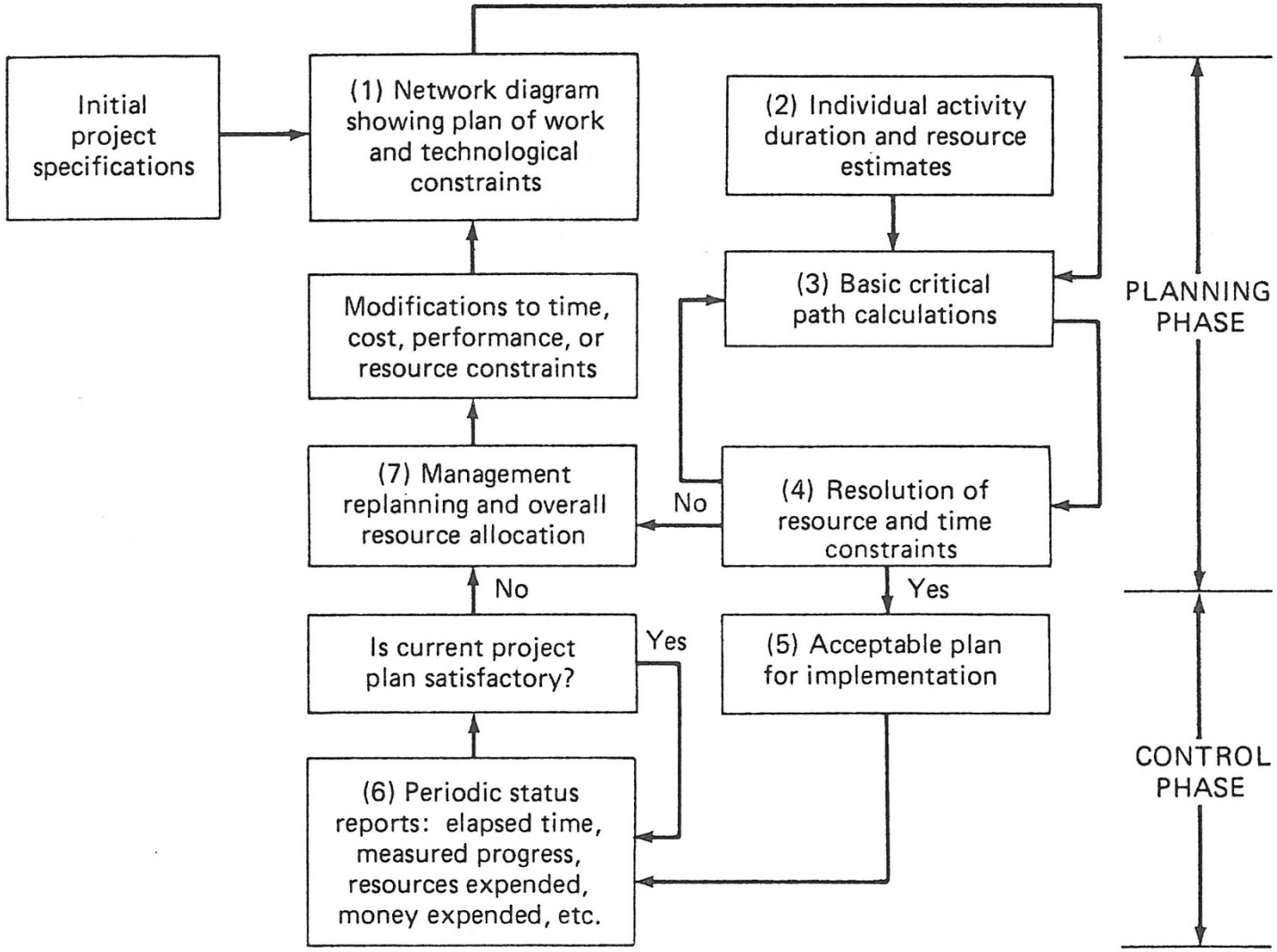
II. Development of the Schedule

- "Scheduling Computations"
- "Calculating the Schedule"
- "Schedule"

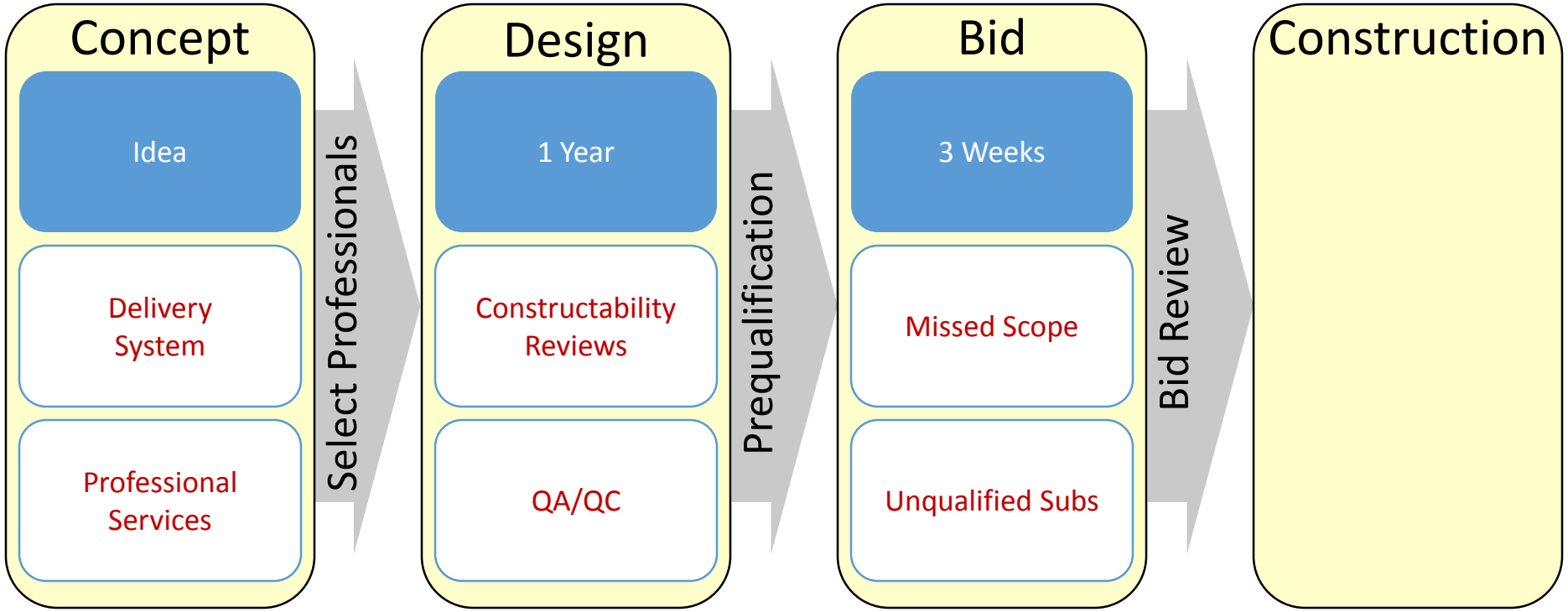
Perform Forward and Backward Pass

II. Development of the Schedule

- Dynamic network-based planning and control procedures



II. Development of the Schedule
Project Phases



II. Development of the Schedule

- When is a schedule developed?
- During 3-week bid?
- Makes No Sense!
- When should a schedule be developed?

II. Development of the Schedule

- Concept Phase
  - Schedule
  - Budget
  - Manage Expectations (of client/end-user)
  - Select Delivery System (roles of professionals)
  - Select Design Professionals

II. Development of the Schedule

- Design Phase
  - Control Client
  - Control Design Team
  - Constructability (Contractor)
  - Contract (Define Standard of Care) – Use Initial Decision Maker (IDM)
  - Control Changes
  - QA/QC Inspection
  - Peer Review
  - Dispute Resolution (AIA, DRB)
  - Schedule

II. Development of the Schedule

- Bid Phase
  - Prequalification
  - Allow appropriate Bid Time
  - Manage Addenda
  - Control Client, Design Team, Changes
  - Requisite preparation of Schedule
  - Schedule?

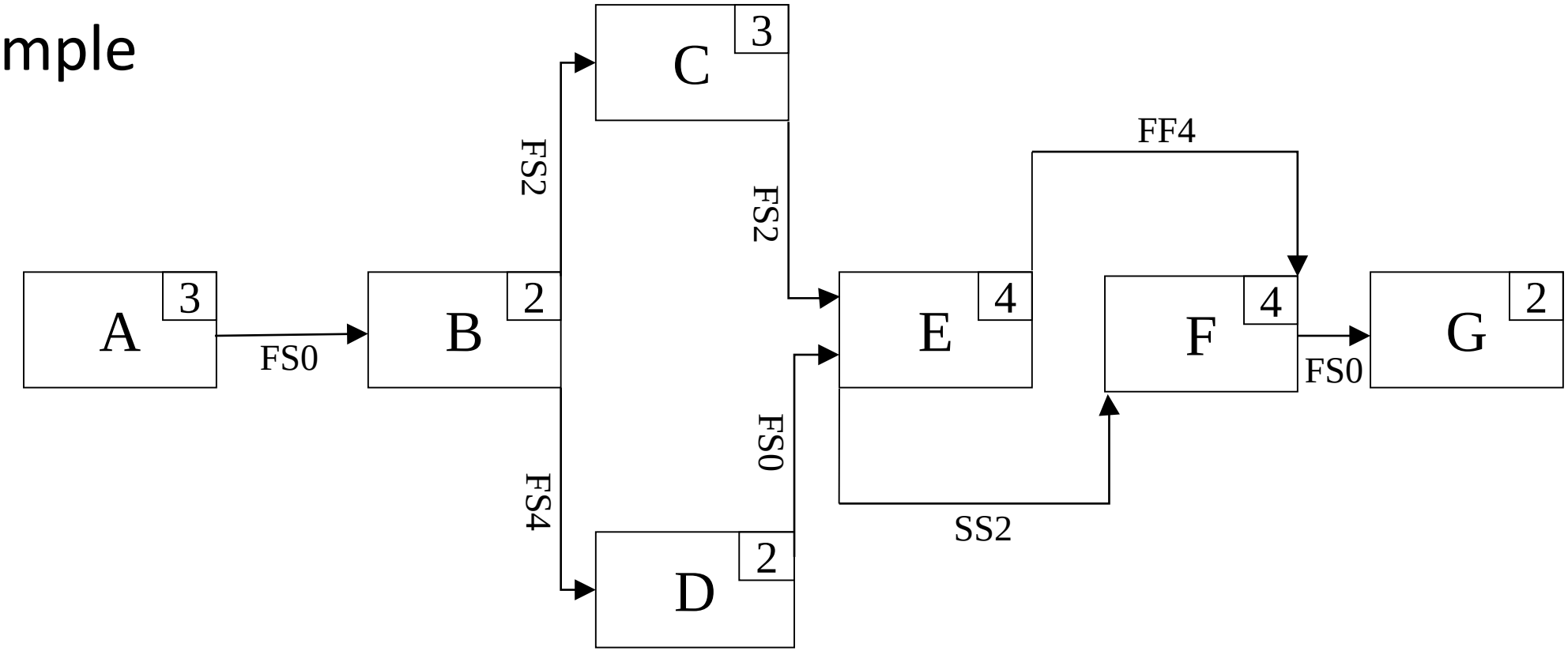
II. Development of the Schedule

- Construction Phase
  - Schedule / Budget (Done)
  - Control Client
  - Control Design Team
  - Constructability
  - Change Management
  - Consistency [Contract Enforcement]

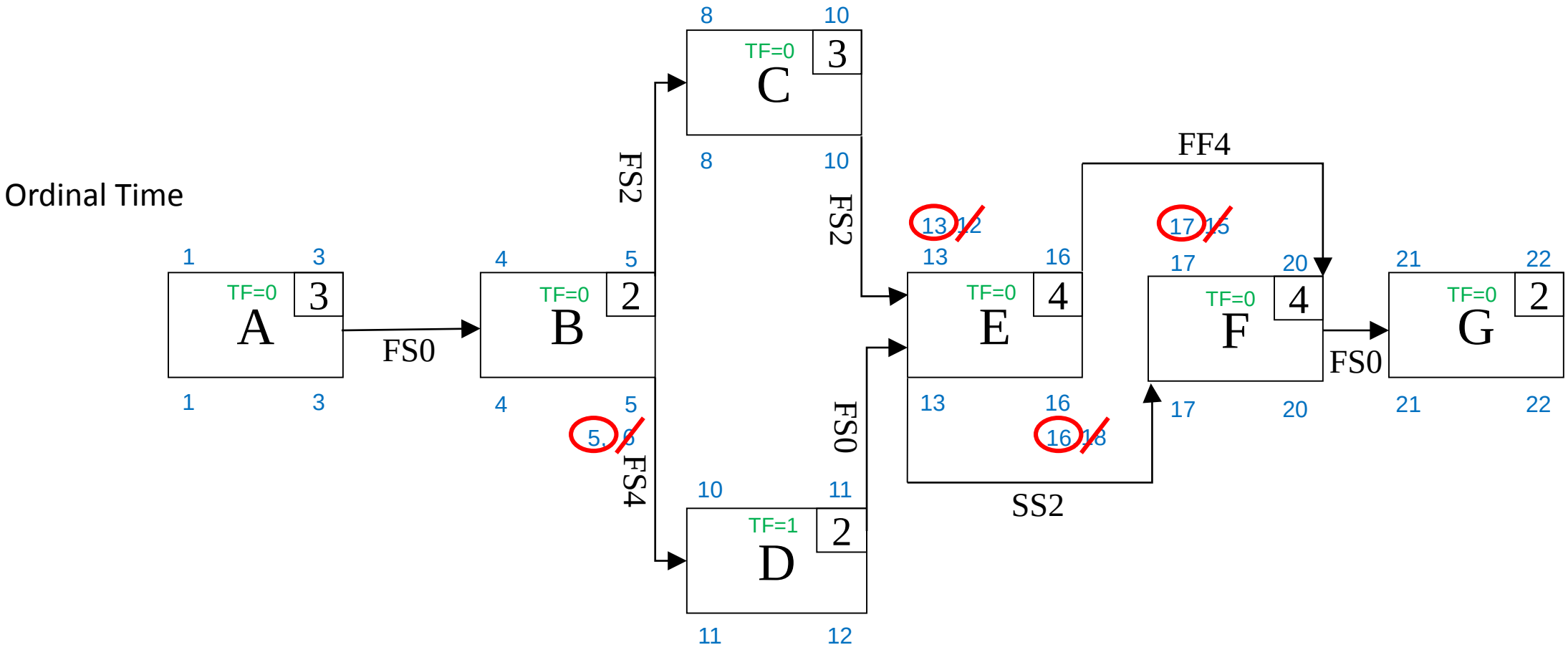
III. Basic Scheduling Computations

III. Basic Scheduling Computations

- Example



III. Basic Scheduling Computations



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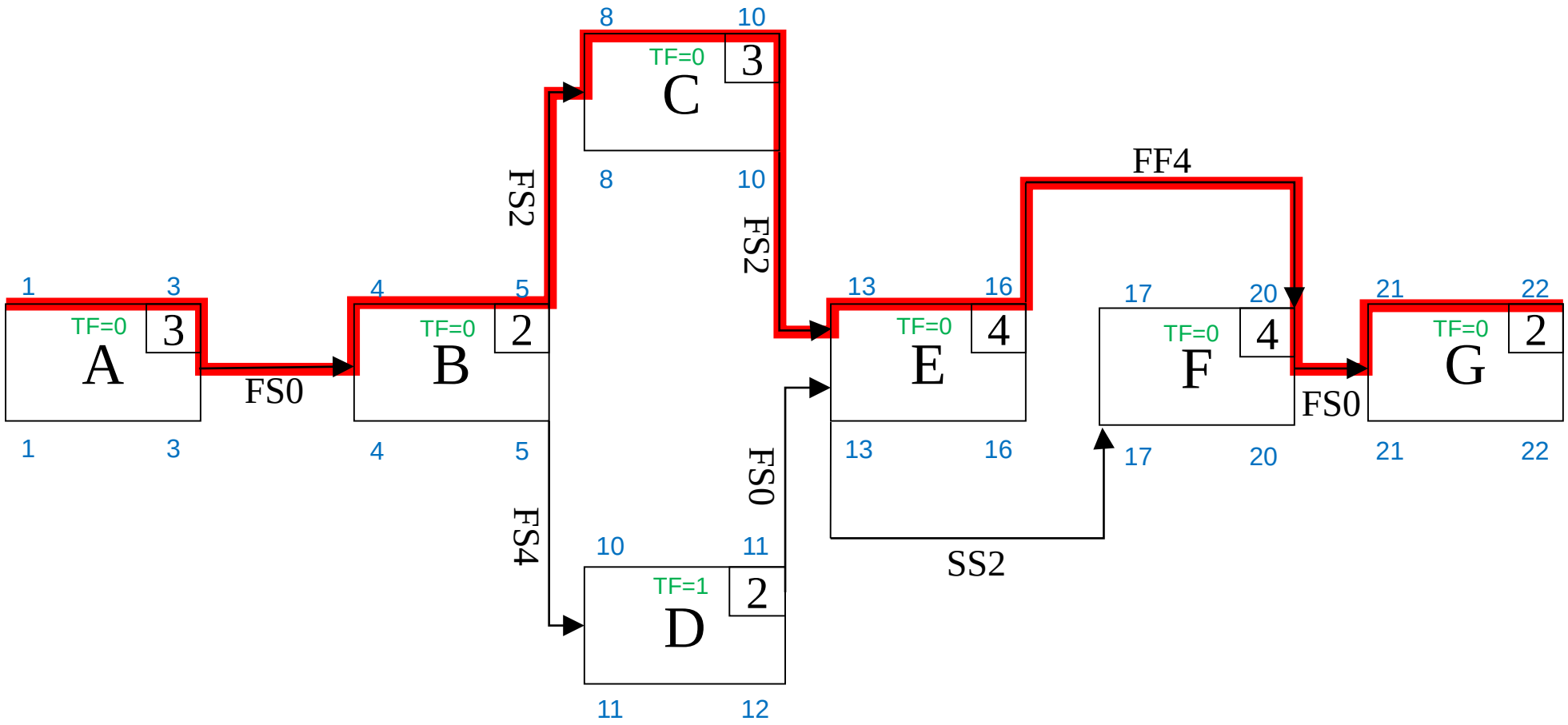
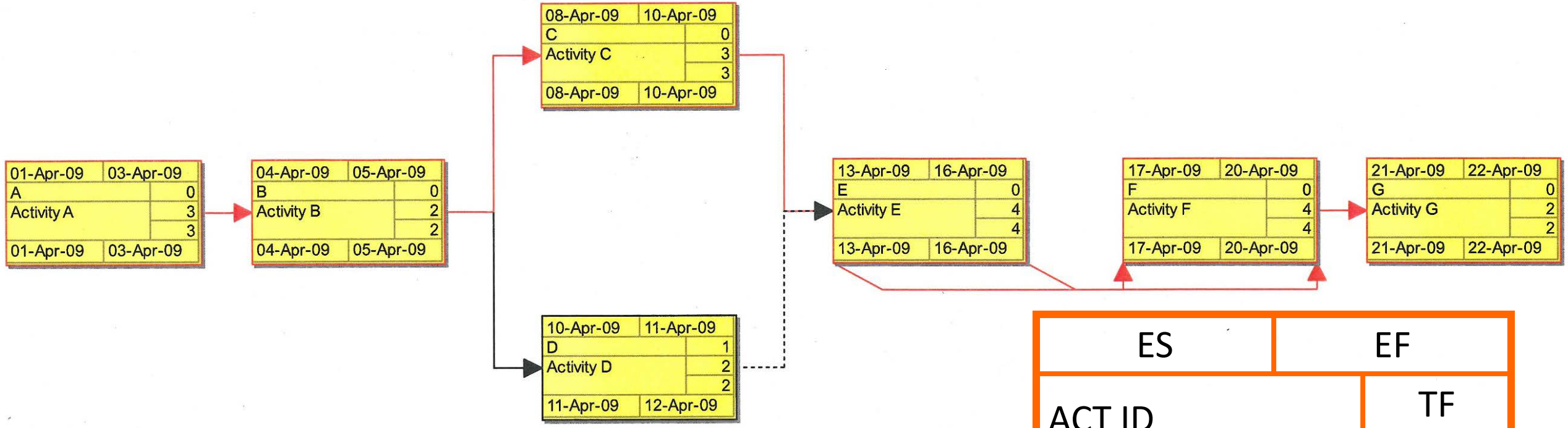


CRITICAL PATH: A-B-C-E-F-G

III. Basic Scheduling Computations



ES	EF
ACT ID	TF
	OD
ACT DES	RD
LS	LF

III. Basic Scheduling Computations

- Comments on:
  - Calendars
  - Weather
  - Float
  - Critical Path

IV. Practical Applications

IV. Practical Applications

- Project Management
  - Management – a process concerned with the achievement of goals or objectives
  - Project Management – involves the coordination of group activities wherein the manager
    - Plans
    - Organizes
    - Staffs
    - Directs
    - Controls

  to achieve an objective with constraints on time, cost, and performance of the end product.

IV. Practical Applications

- Project Management
- Scheduling is one component of Project Management System
- Question: How is your project doing?
  - Money
  - Time

  Answer must be integrated

IV. Practical Applications

- Money → Budget → Cost Code
- Time → Schedule → Activity

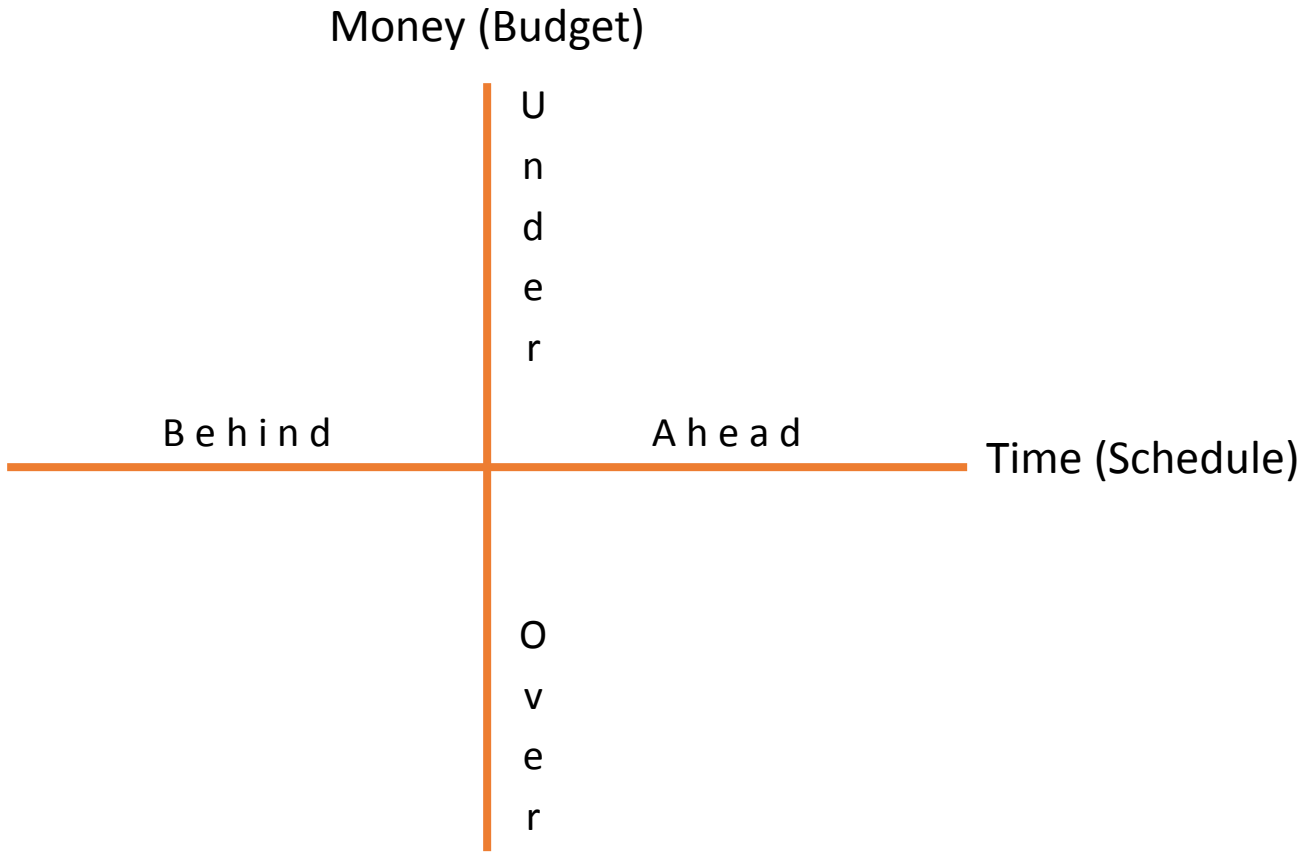
IV. Practical Applications

- Comparative Analysis

Plan → Actual

IV. Practical Applications

- Comparative Analysis



IV. Practical Applications

- Project Management Functions
  - Planning
  - Scheduling
  - Monitoring
  - Controlling

IV. Practical Applications

- Controlling
  - The process of making events conform to schedules by coordinating the action of all parts of the organization according to the plan

IV. Practical Applications

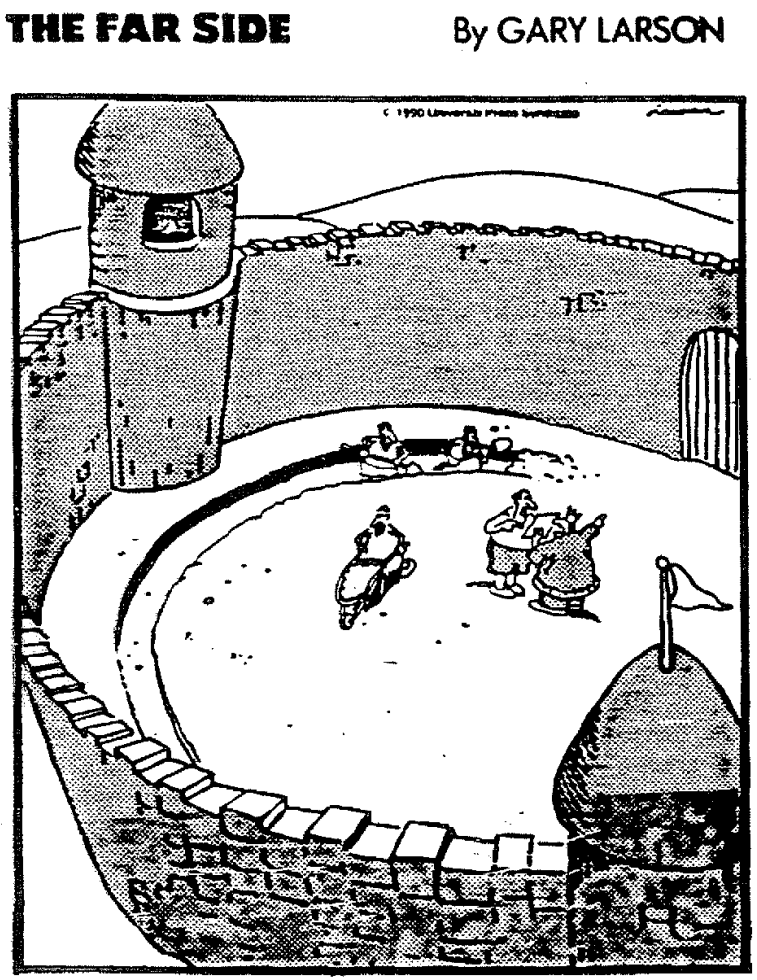
- How do you measure success?
  - On Time
  - On Budget
  - Acceptable Quality
  - Acceptable Function
  - Safety
  - No Claims
  - No Lawsuits

IV. Practical Applications

- What is failure?

IV. Practical Applications

IV. Practical Applications



Suddenly, a heated exchange took place between the king and the moat Contractor.

IV. Practical Applications

- Importance of Time in Construction Contracts
  - How duties and responsibilities are defined in the contract:
    1. Scope: What will be provided
    2. Price: How much compensation will be paid for the item or performance provided
    3. Time: When is the performance required
  - The project schedule…
    - Baseline for performance of contracting parties
    - Used to assess parties' respective rights and obligations

IV. Practical Applications

- As-Planned (Baseline) Schedule
  - Project Scope at time of award/bid
  - Represent contractor's plan before:
    - Any Changes (Change Orders)
    - Starting construction
  - Comply with contract requirements
  - Good for about 30 days

IV. Practical Applications

- Updated Schedule
  - Reflect “current” status of project as of a certain date (Data Date)
  - Contain accurate information on work completed per activity:
    - Actual Start
    - Actual Finish
    - Status of activities started but not yet finished
  - Recalculate a schedule looking forward

IV. Practical Applications

- What can change in an updated schedule?
  - A lot
    - Projected dates for activities
    - Float values
    - The Critical Path
    - Project Completion Date(s)

IV. Practical Applications

- Revised Schedule
  - Whenever a fundamental change is made to the schedule.
    - Add activities
    - Delete activities
    - Change, add or delete any relationship(s)
    - Change a duration
  - When is this appropriate?

IV. Practical Applications

- It's all about:

Schedule Maintenance

"Living, breathing document"

"Dynamic Tool"

"Forward Looking"

IV. Practical Applications

- "As-Built" Schedule
  - All activities completed
  - Really a database of information...not a schedule

IV. Practical Applications

- A CPM Construction Schedule is a model of how the project is planned to be built.
- At the “end-of-the-day”

  The “As-Built” Schedule becomes a record of how the project was built.

V. Delay Analysis

V. Delay Analysis

- It's all about:

Schedule Maintenance

"Living, breathing document"

"Dynamic Tool"

"Forward Looking"

V. Delay Analysis

- Delay
  - To put off to a later time: postpone
  - To impede or retard
  - An instance of being delayed [9]

[9] Webster's Dictionary – ISBN 0-345-40095-X

V. Delay Analysis

- Delay in the Context of the Construction Industry
  - In construction claims, the term “delay” is used to mean two different but related matters. Delay is often used to mean the time period during which some part of the construction project has been extended beyond what was originally planned due to unanticipated circumstances.
  - Delay can also be the incident that affects the performance of a particular activity, with or without affecting project completion.

V. Delay Analysis

- Delay in the Context of the Construction Industry
  - Although there may be unique aspects of the different projects, sites, contract terms, and customs and practices in different parts of the world, for the most part the reality of delay unfortunately is universal to the construction industry. [10]

[10] Construction Delay Claims – ISBN 978-1-4548-4517-1

V. Delay Analysis

- Delay v. Critical Delay
  - Critical project delays are those that extend the overall project completion date. [11]
    - Milestones
    - Distinction in terms of damages

[11] Construction Delay Claims – ISBN 978-1-4548-4517-1

V. Delay Analysis

- Other related terms:
  - Disruption
    - "An activity-specific loss of productivity caused by changes in the working conditions under which that activity was (is) performed." [12]
    - "A material alteration in the performance conditions that were reasonably expected at the time of bid, resulting in increased cost of performance." [13]

[12] Construction Delay Claims – ISBN 978-1-4548-4517-1

[13] Construction Delay Claims – ISBN 978-1-4548-4517-1

V. Delay Analysis

- Other related terms:
  - Acceleration
    - "Is an attempt to speed up the progress of the work to achieve an earlier project completion or to overcome previous delays." [14]
  - Constructive Acceleration
    - "Is based on the premise that a contractor is entitled to a time extension for excusable delays but it is not granted." [15]

[14] Construction Delay Claims – ISBN 978-1-4548-4517-1

[15] Construction Delay Claims – ISBN 978-1-4548-4517-1

V. Delay Analysis

- Constructive Acceleration Hurdles
  1. There must be an excusable delay.
  2. There must have been timely notice of the delay and a proper request for a time extension.
  3. The time extension request must either be postponed or refused.
  4. The owner or other party must by coercion, direction, or in some other manner that reasonably can be construed as a command order completion within the unextended performance period.
  5. The contractor must actually accelerate its performance and thereby incur added costs. [16]

[16] Construction Delay Claims – ISBN 978-1-4548-4517-1

V. Delay Analysis

- Causes of Delay
  - Owner
  - Designer
  - Contractor
  - Delays That May Be Beyond the Control of the Parties

V. Delay Analysis

- Owner
  - Changes
  - Access to Project Site
  - Right-of-Way
  - Utility relocation delays
  - Unidentified or mislocated utilities
  - Demolition of existing structures
  - Differing site conditions
  - Relocation of tenants
  - Approvals from governing authorities
  - Payment delays
  - Project financing
  - Design defects (vicarious liability)
  - Defective specifications
  - Tardy shop drawing processing
  - Inspection delays
  - Delayed notice to proceed/contract award
  - Inappropriate stop work orders
  - Owner-furnished items
  - Over-inspection
  - Constructive changes
  - Owner interference
  - Failure to coordinate multiple prime contractors

V. Delay Analysis

- Designer
  - Design defects, errors, and omissions
  - Slow correction of defects
  - Tardy shop drawing review
  - Delayed testing and inspections
  - Poor contract administration
  - Late responses to Requests for Information (RFI)

V. Delay Analysis

- Contractor
  - Inadequacy of labor force
  - Failure to evaluate site
  - Failure to evaluate design
  - Underbidding
  - Management failures
  - Scheduling and planning
  - Coordination and subcontractors
  - Subcontractor delays
  - Material procurement
  - Equipment failures
  - Financial resources
  - Construction defects

V. Delay Analysis

- Delays That May Be Beyond the Control of the Parties
  - Unusually severe weather conditions
  - Labor disputes
  - Unavoidable calamities
  - Force Majeure “Acts of God”
  - Unusual delays in transportation
  - Floods
  - Governmental acts
  - Vandalism
  - Fire
  - Strikes

V. Delay Analysis

- Categories of Delay

V. Delay Analysis

- Concurrent Delay
  - What is it?
  - Proper analysis of Concurrent Delay adds an order of magnitude to the difficulty.

V. Delay Analysis

"Evaluation of delay claims and schedule disruptions is as much an art as it is a science, even though scheduling may involve mathematical formulas, calculations, and computer models." [17]

[17] Construction Delay Claims – ISBN 978-1-4548-4517-1

V. Delay Analysis

- General Methodologies
  - A. Impacted As-Planned
  - B. As-Built
    - As-Planned to As-Built Comparison
    - As-Built
    - Collapsed As-Built
  - C. Time Impact Analysis
    - aka. Update Impact Method

V. Delay Analysis

A. Impacted As-Planned
   - Measures impact on planned not actual performance.
   - Uses only the planned schedule.
   - Assumes as-planned logic is followed.

V. Delay Analysis

B. As-Built
- All As-Built methods are founded on the use of as-built data or “As-Built Schedules.”
  - As-Planned to As-Built Comparison
    - Logic may be different
    - Critical Path is not static
  - As-Built (Alone)
    - Critical Path ???
  - Collapsed As-Built
    - Remove delays systematically = but for “would have completed”

V. Delay Analysis

C. Time Impact Analysis
- aka. Corps method, windows analysis, update impact method, contemporaneous impact, snapshot techniques
  1. Update schedule at time of delay
  2. Impact (insert delay fragnet)
  3. Determine impact (calculate schedule)
  4. Update
- Goal: develop a stop-action picture of project each time a delay or disruption occurs

V. Delay Analysis

- Forensic
  - Of, suited to, or used in courts of law or in public debate [18]

[18] Webster's Dictionary – ISBN 0-345-40095-X

V. Delay Analysis

- Issues
  - Retrospective v. Prospective Analysis

V. Delay Analysis

- Is there one authoritative text on forensic schedule analysis?
- Is there any authoritative text on forensic schedule analysis?

- It's all about:

Schedule Maintenance

"Living, breathing document"

"Dynamic Tool"

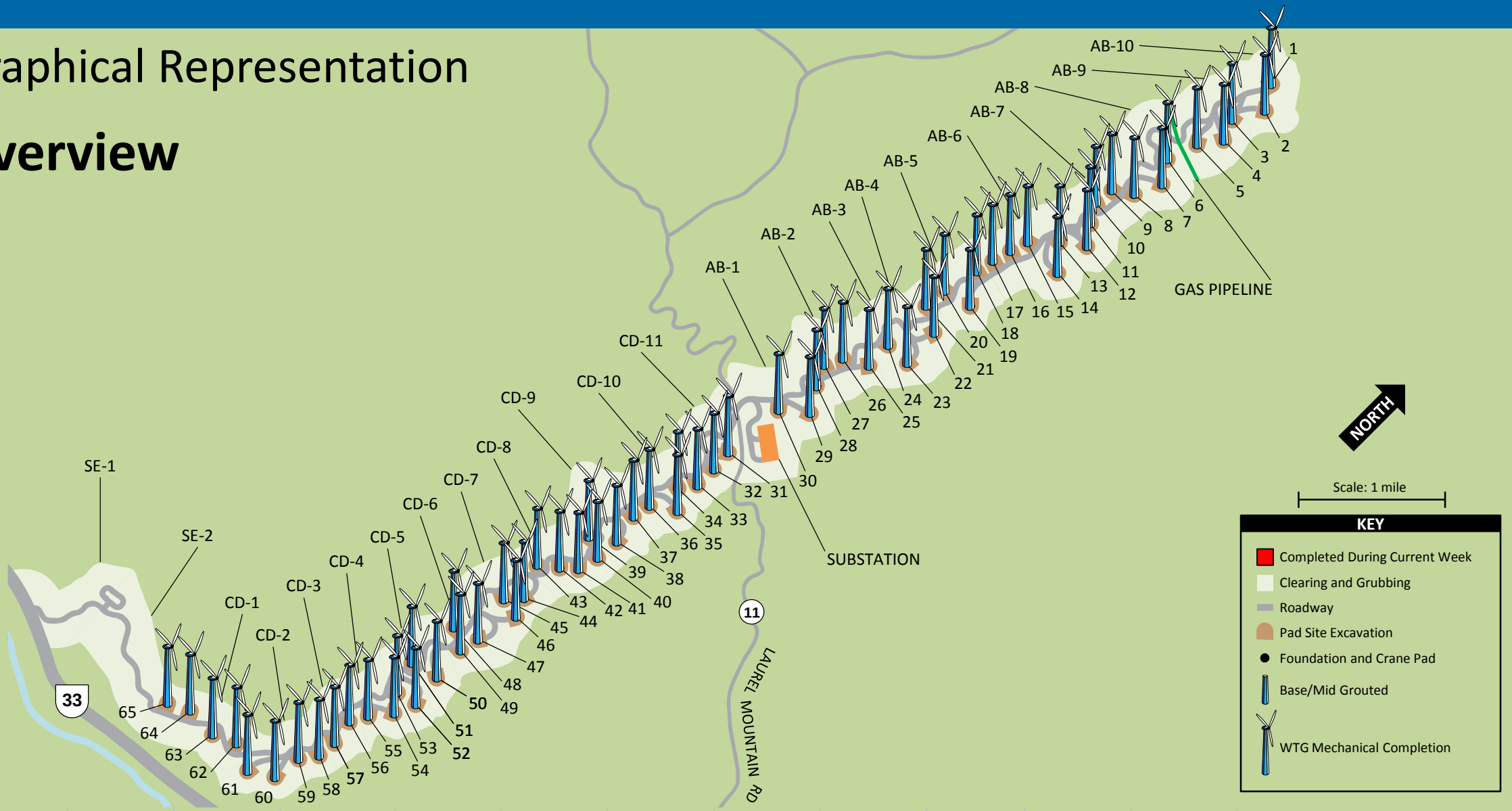
"Forward Looking"

VI. Communicating Complex Analyses To The Non-technical Audience

Laurel Mountain Wind Project, WV

III.A. Graphical Representation

Site Overview



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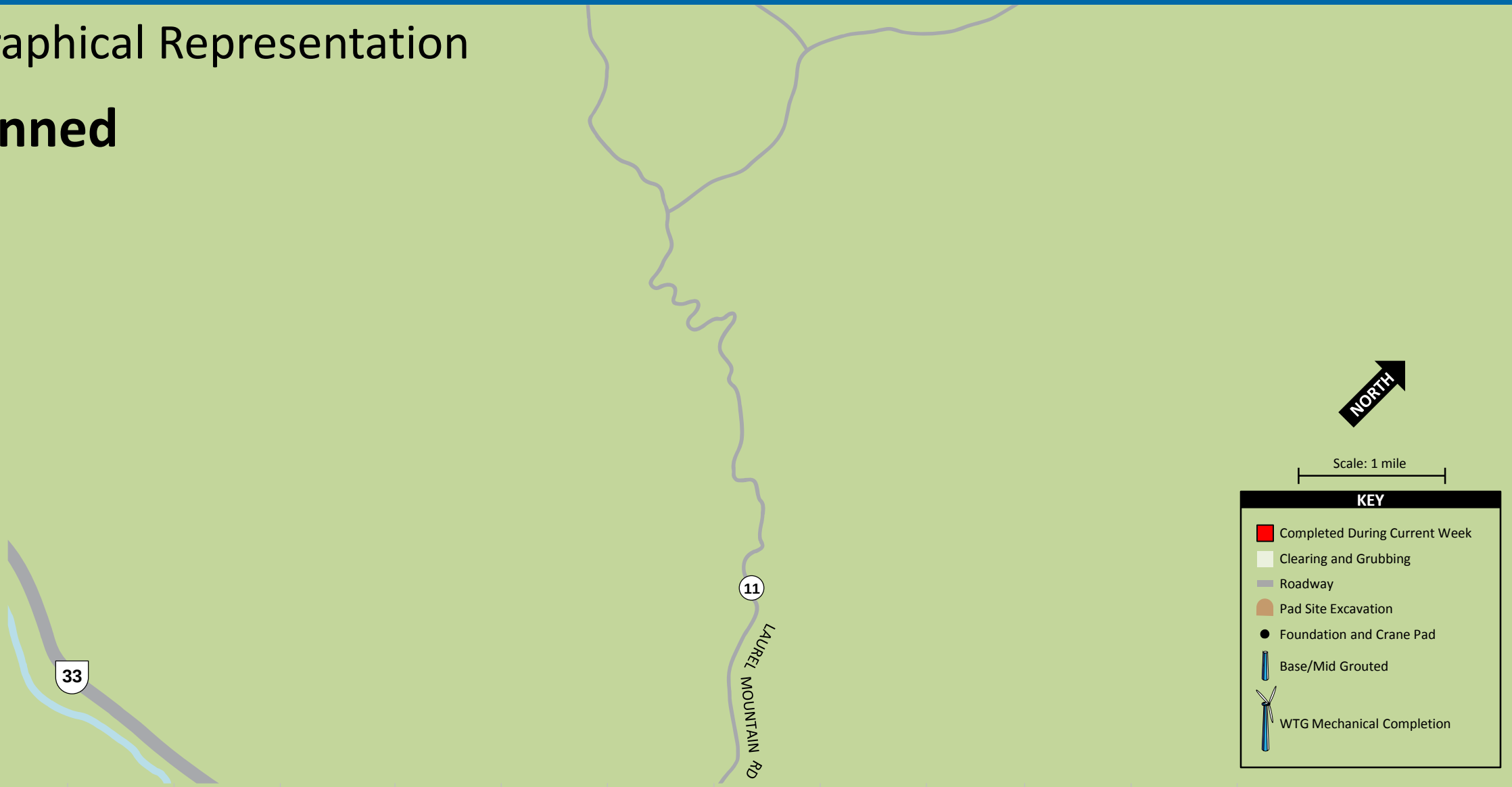
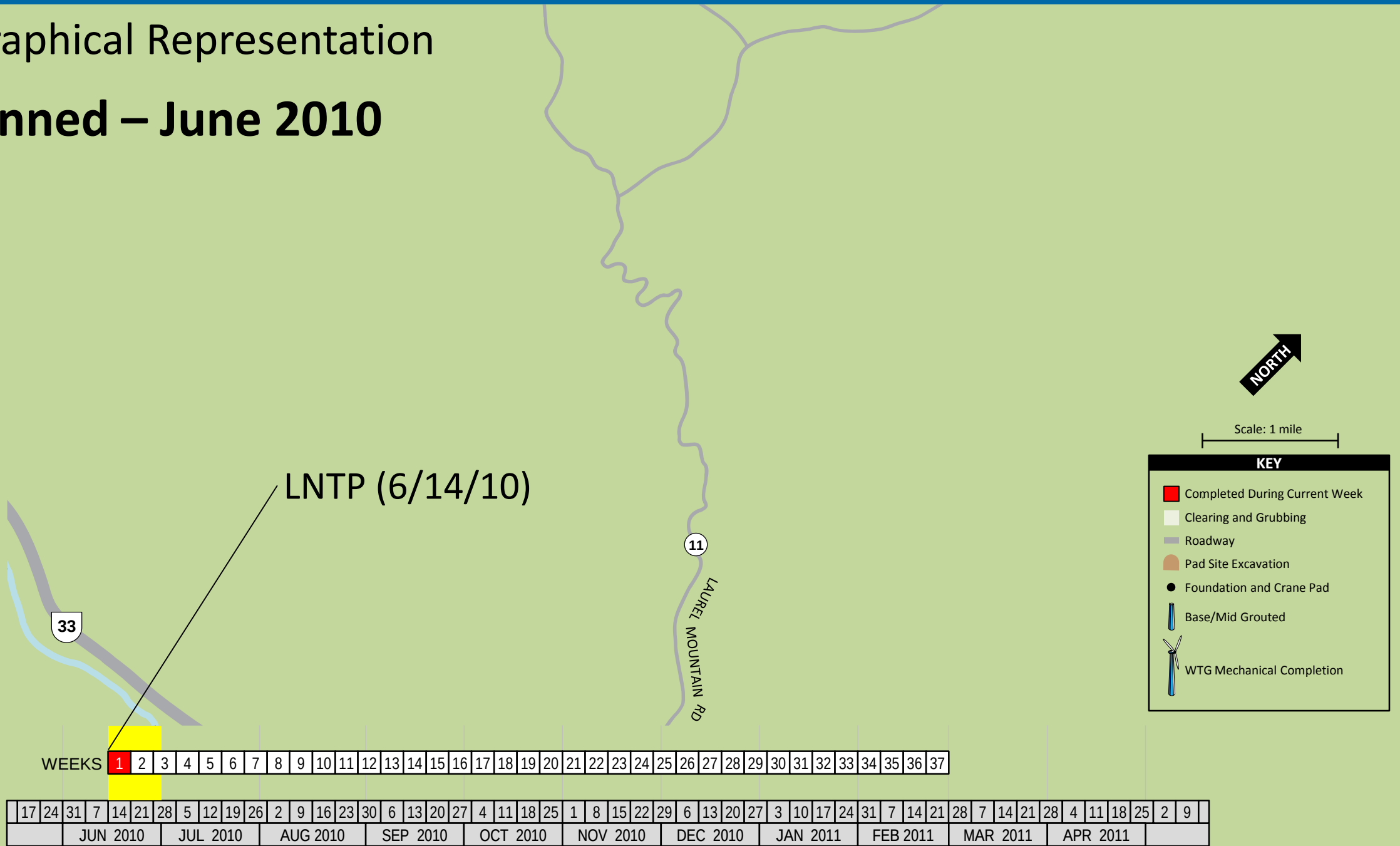
III.A. Graphical Representation

As-Planned



III.A. Graphical Representation

As-Planned – June 2010



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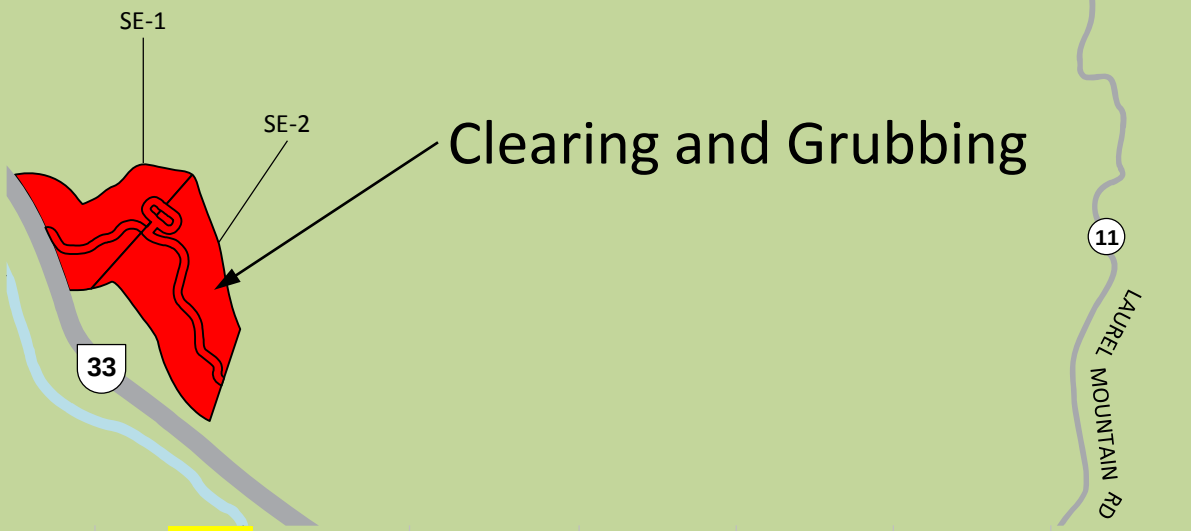

NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

WEEKS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37

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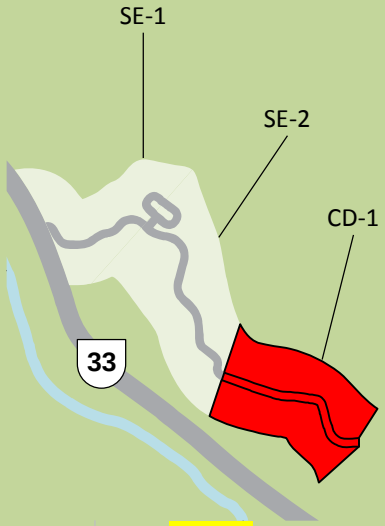
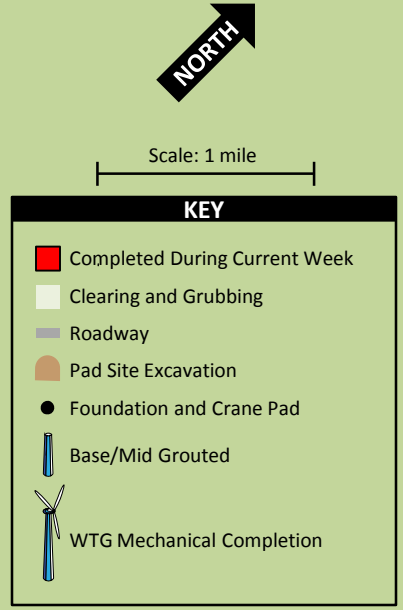
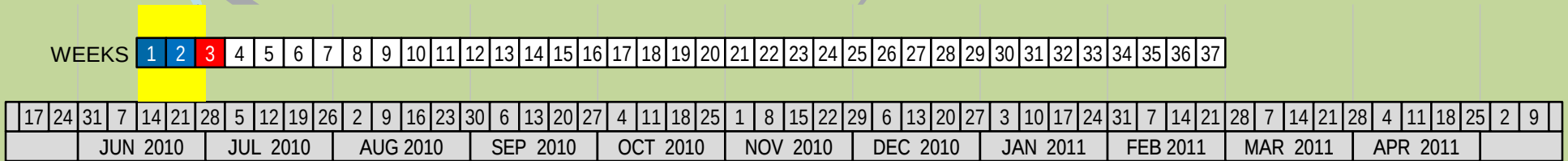
- As-Planned – June 2010

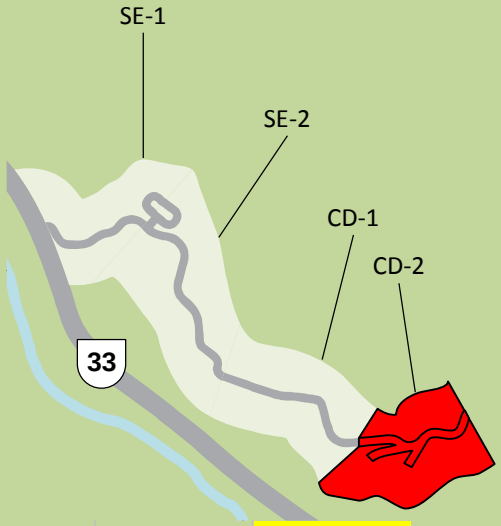






III.A. Graphical Representation

As-Planned – July 2010



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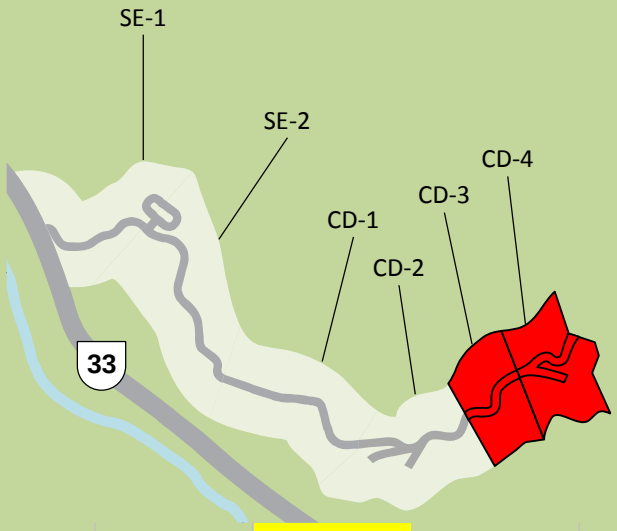

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WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

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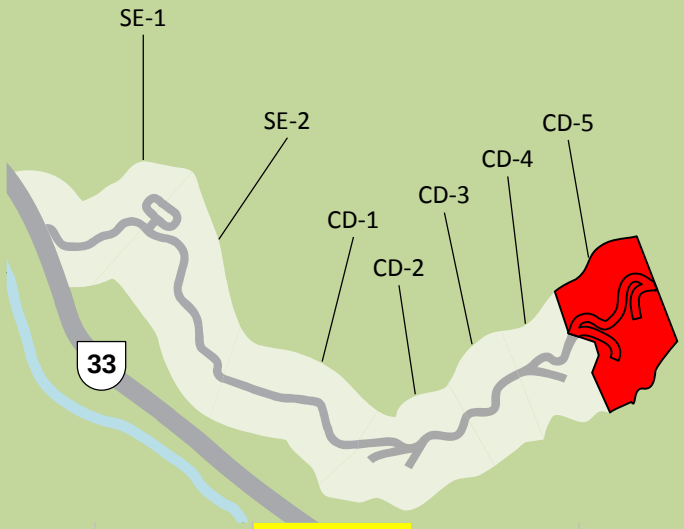
As-Planned – July 2010



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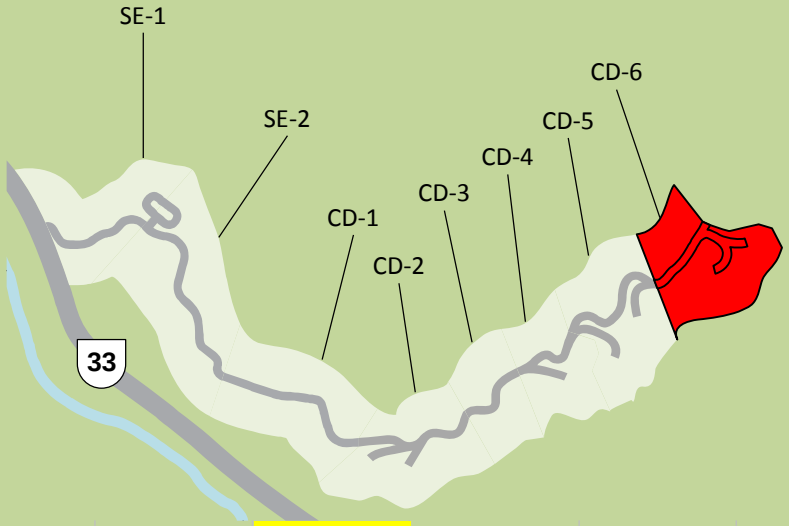

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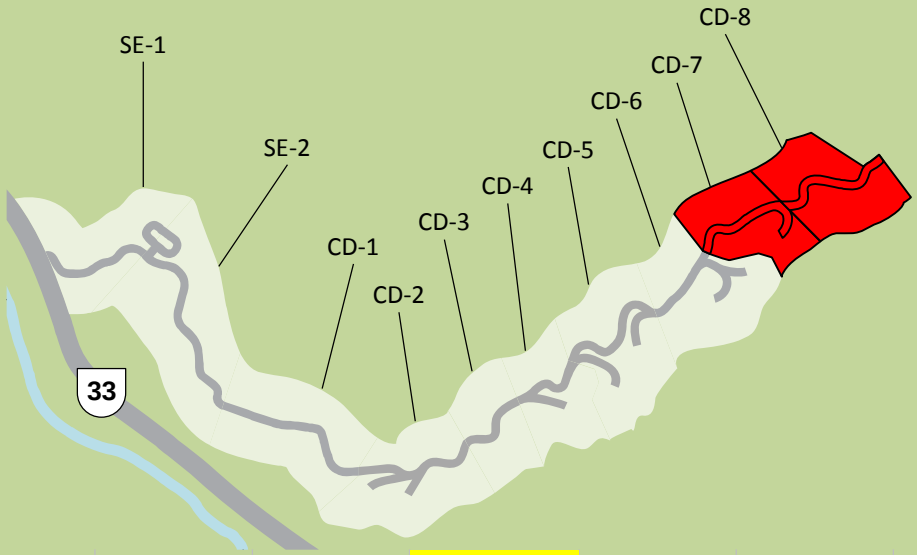
JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – August 2010



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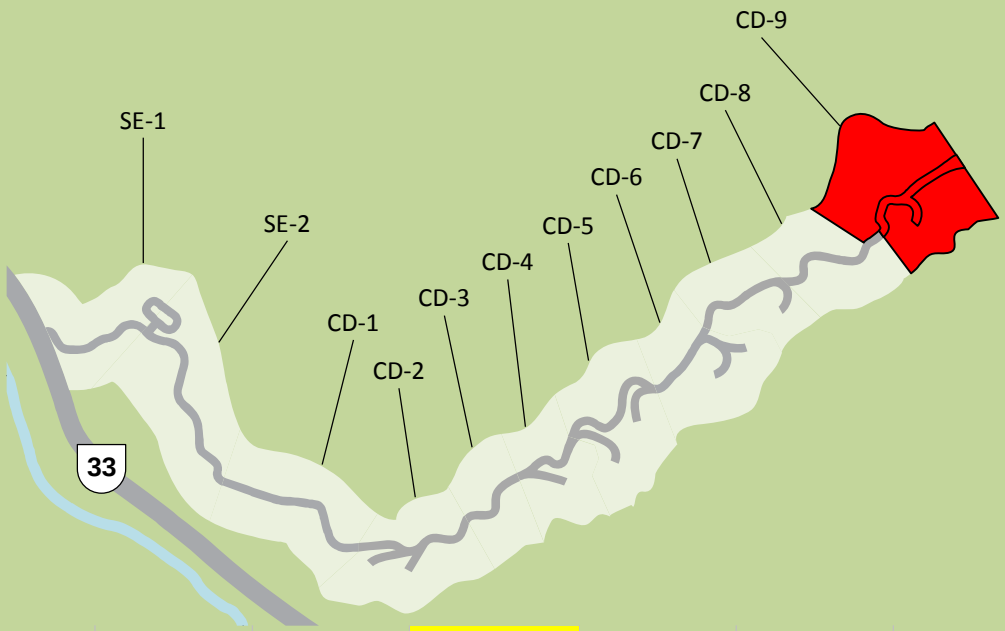

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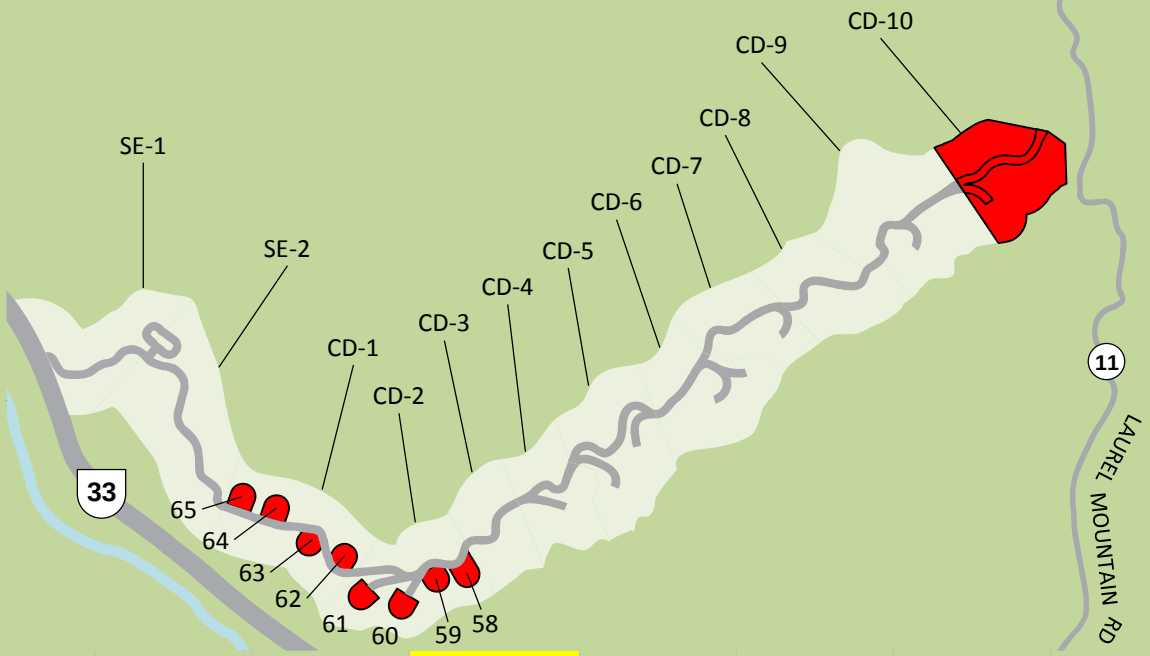
III.A. Graphical Representation

As-Planned – August 2010



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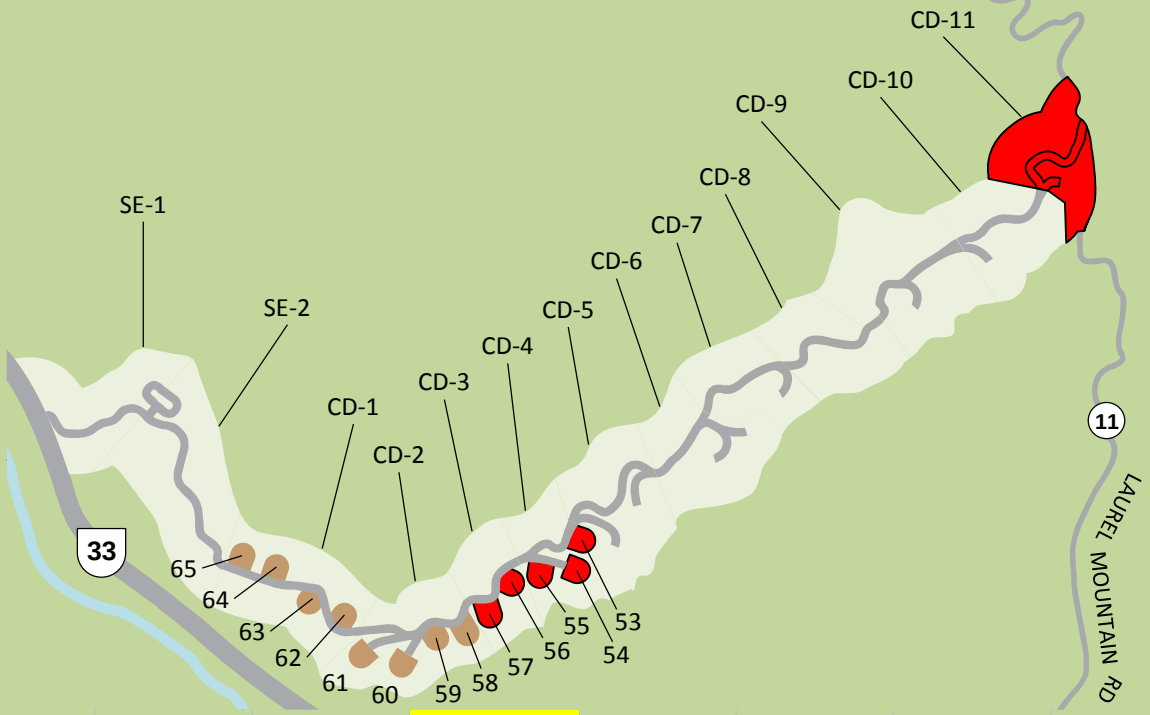
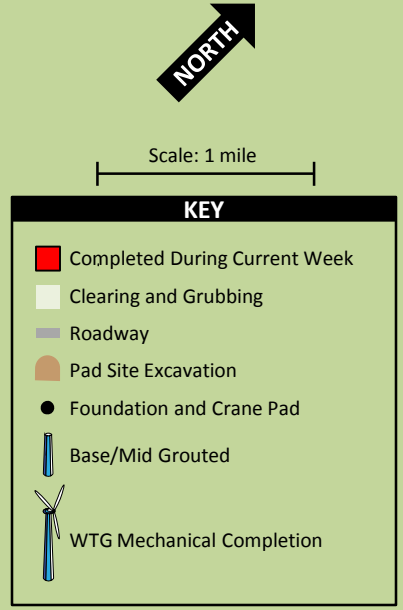
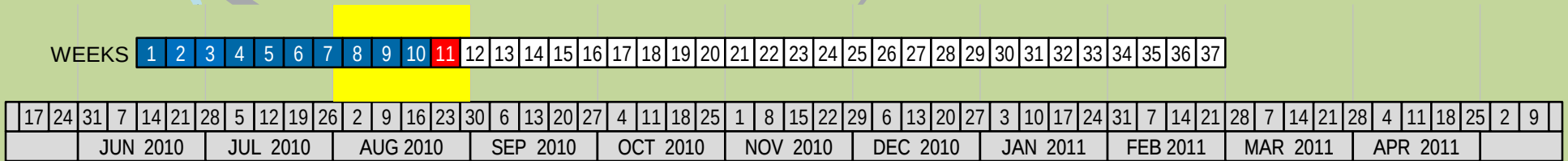
III.A. Graphical Representation

As-Planned – August 2010

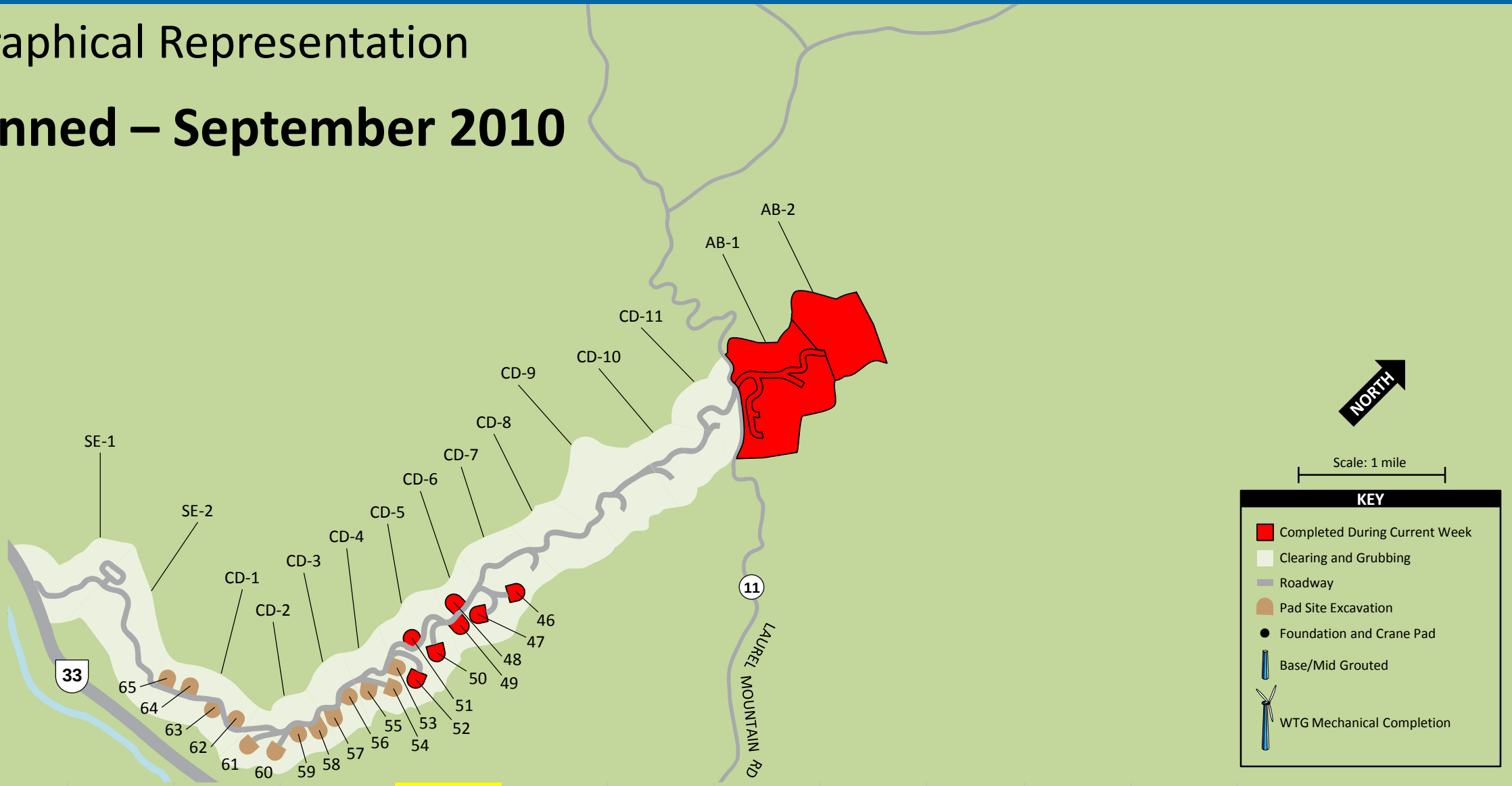






III.A. Graphical Representation

As-Planned – September 2010



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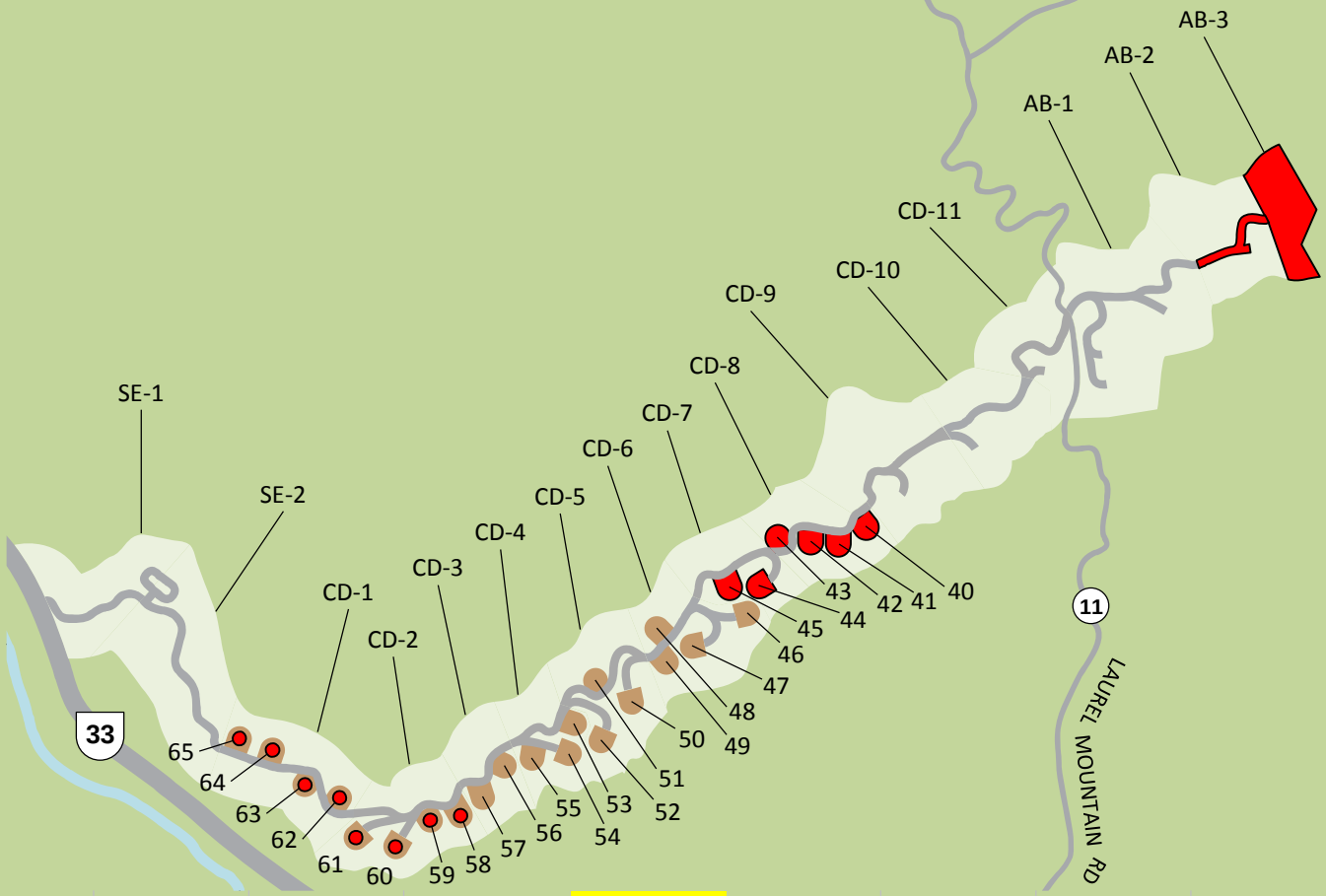
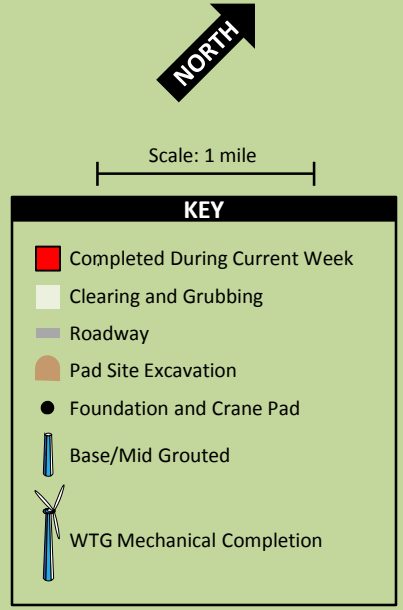
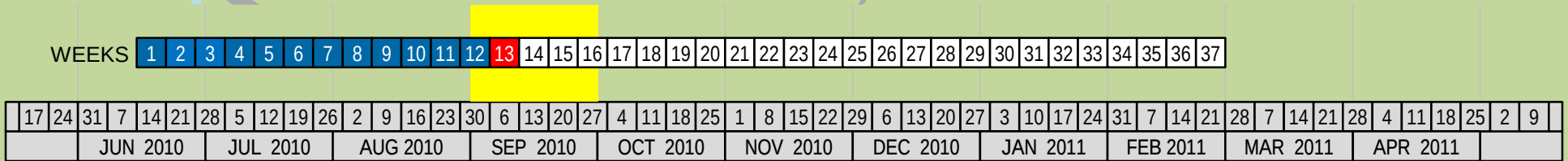
As-Planned – September 2010

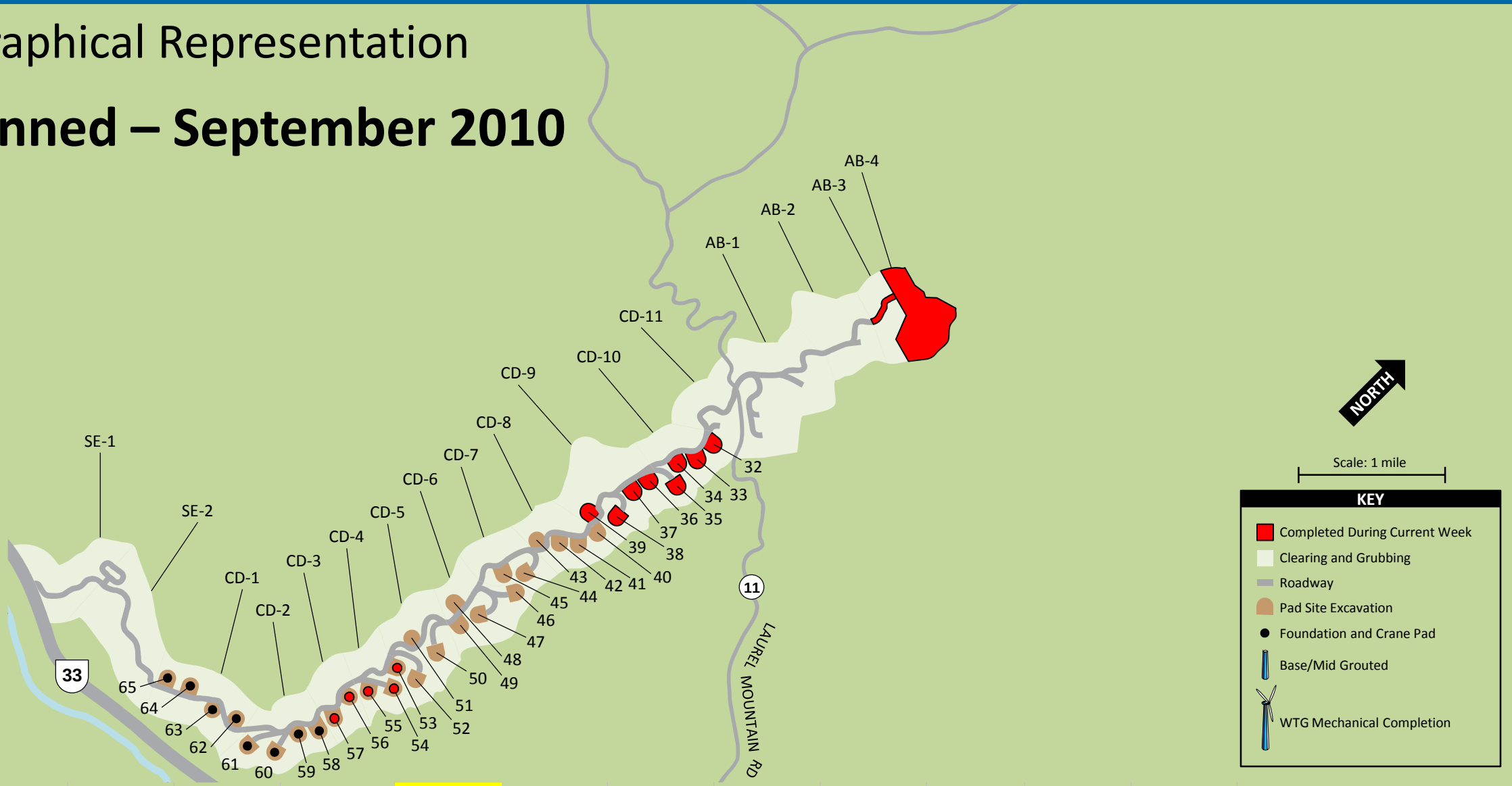






III.A. Graphical Representation

As-Planned – September 2010



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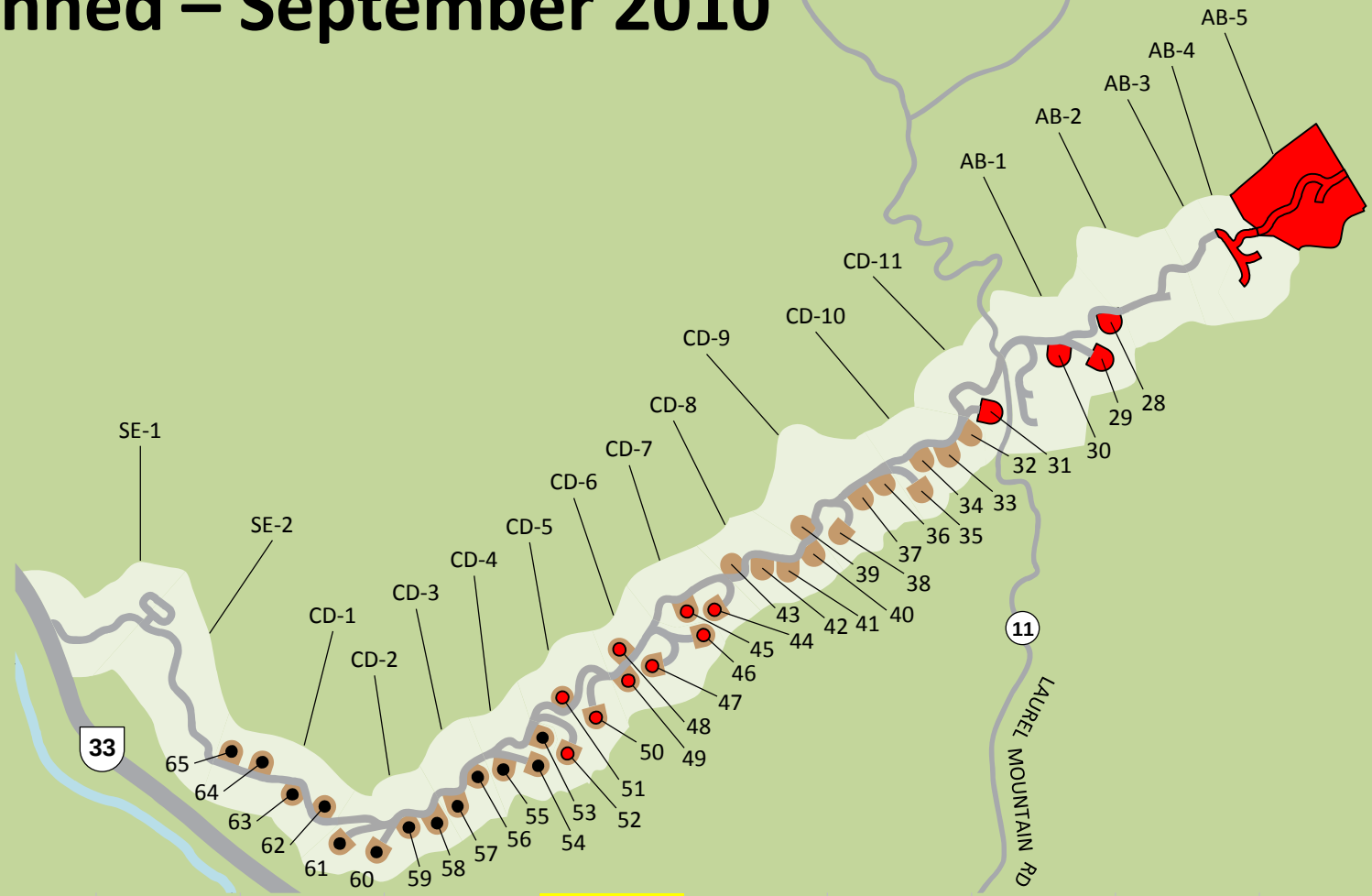
III.A. Graphical Representation

As-Planned – September 2010



NORTH

Scale: 1 mile

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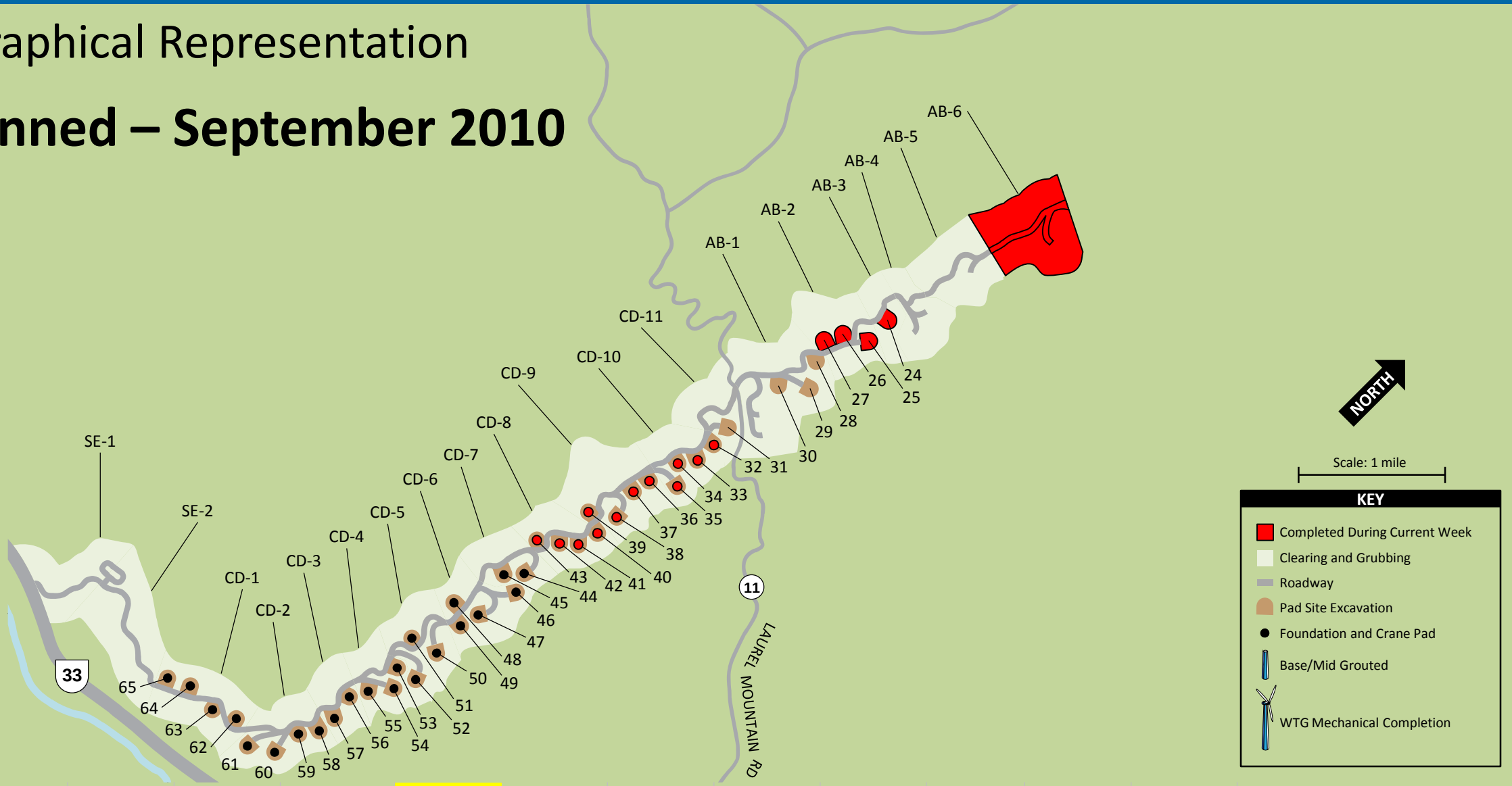

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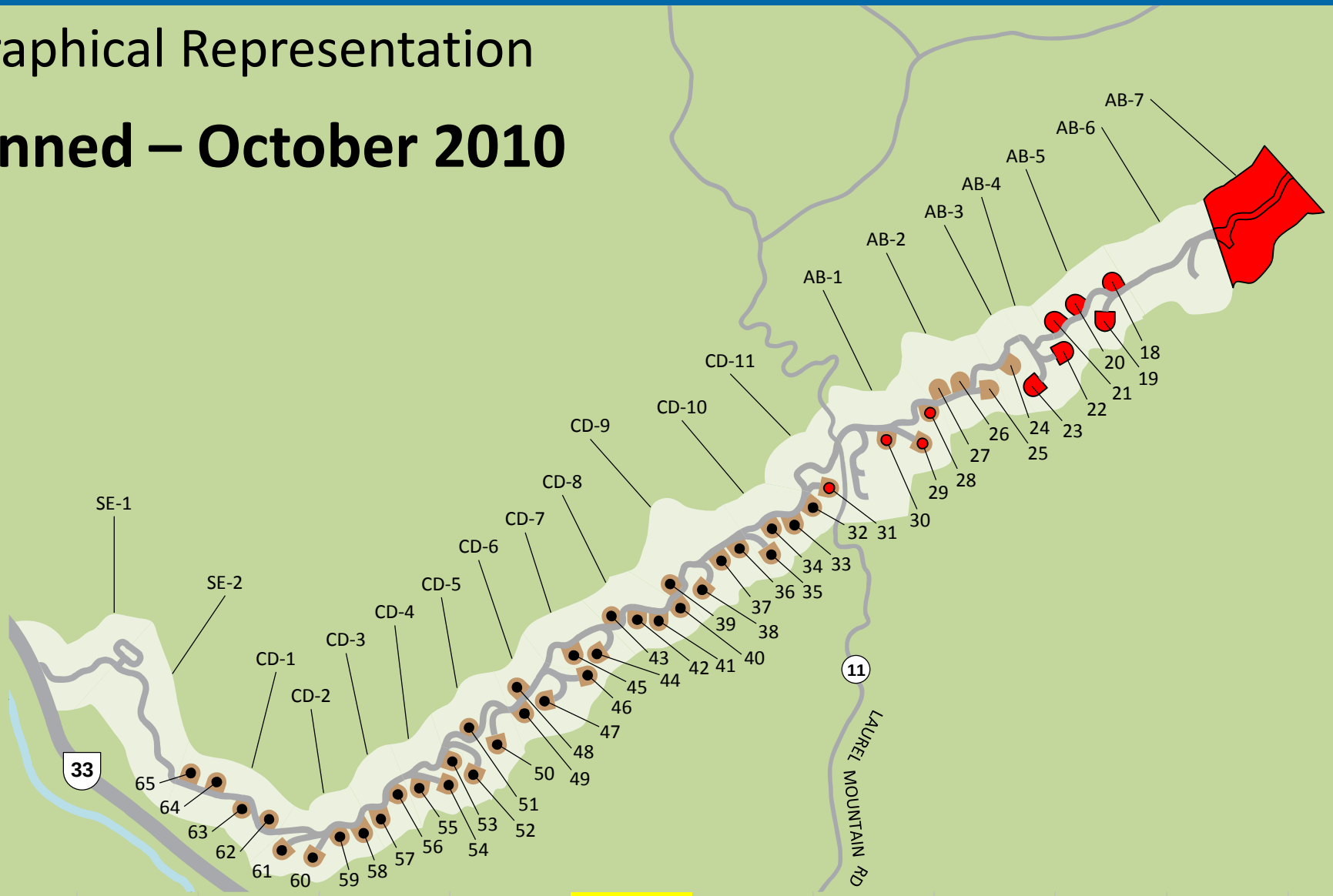
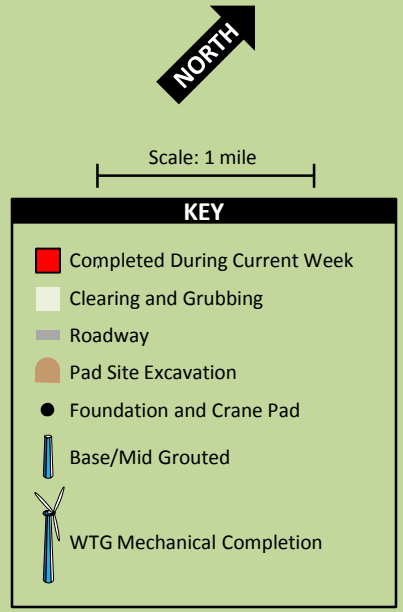
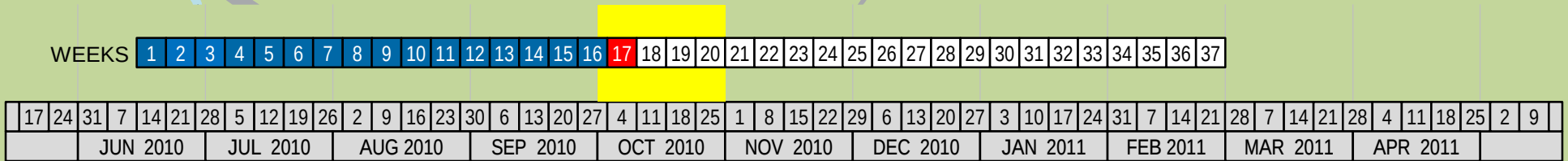
III.A. Graphical Representation

As-Planned – October 2010

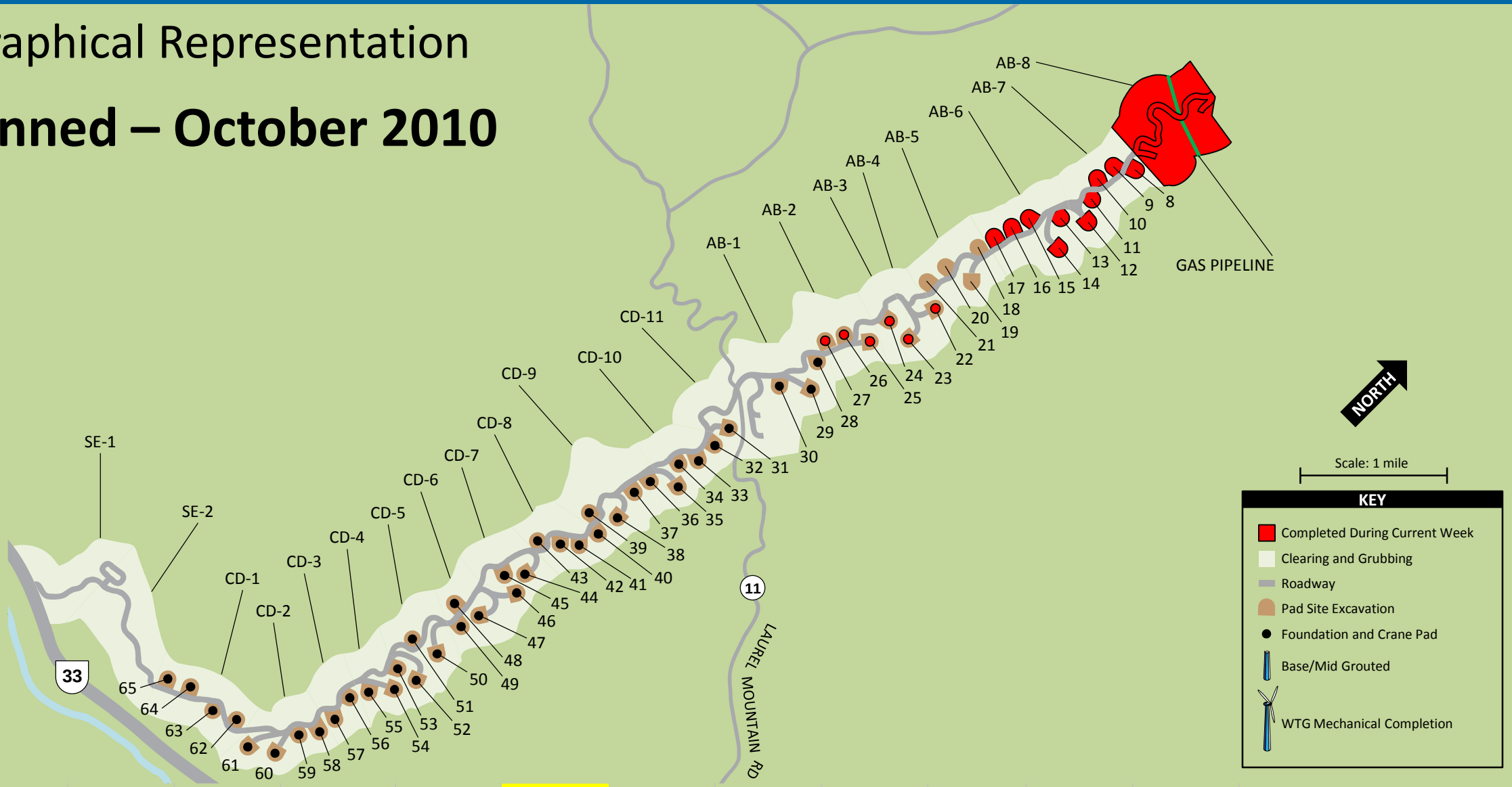






III.A. Graphical Representation

As-Planned – October 2010



WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

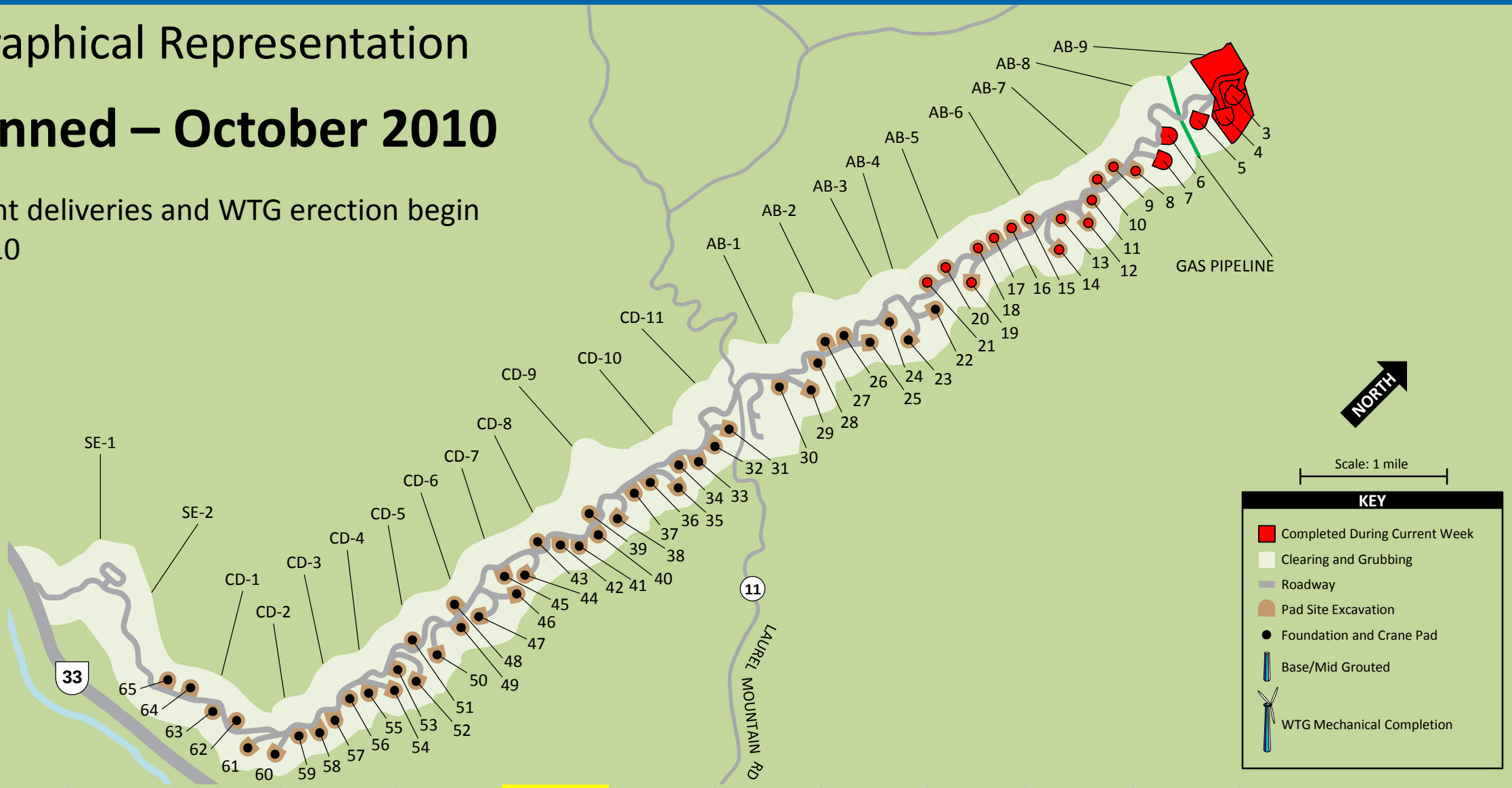
17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – October 2010

- Component deliveries and WTG erection begin 10/18/2010



WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

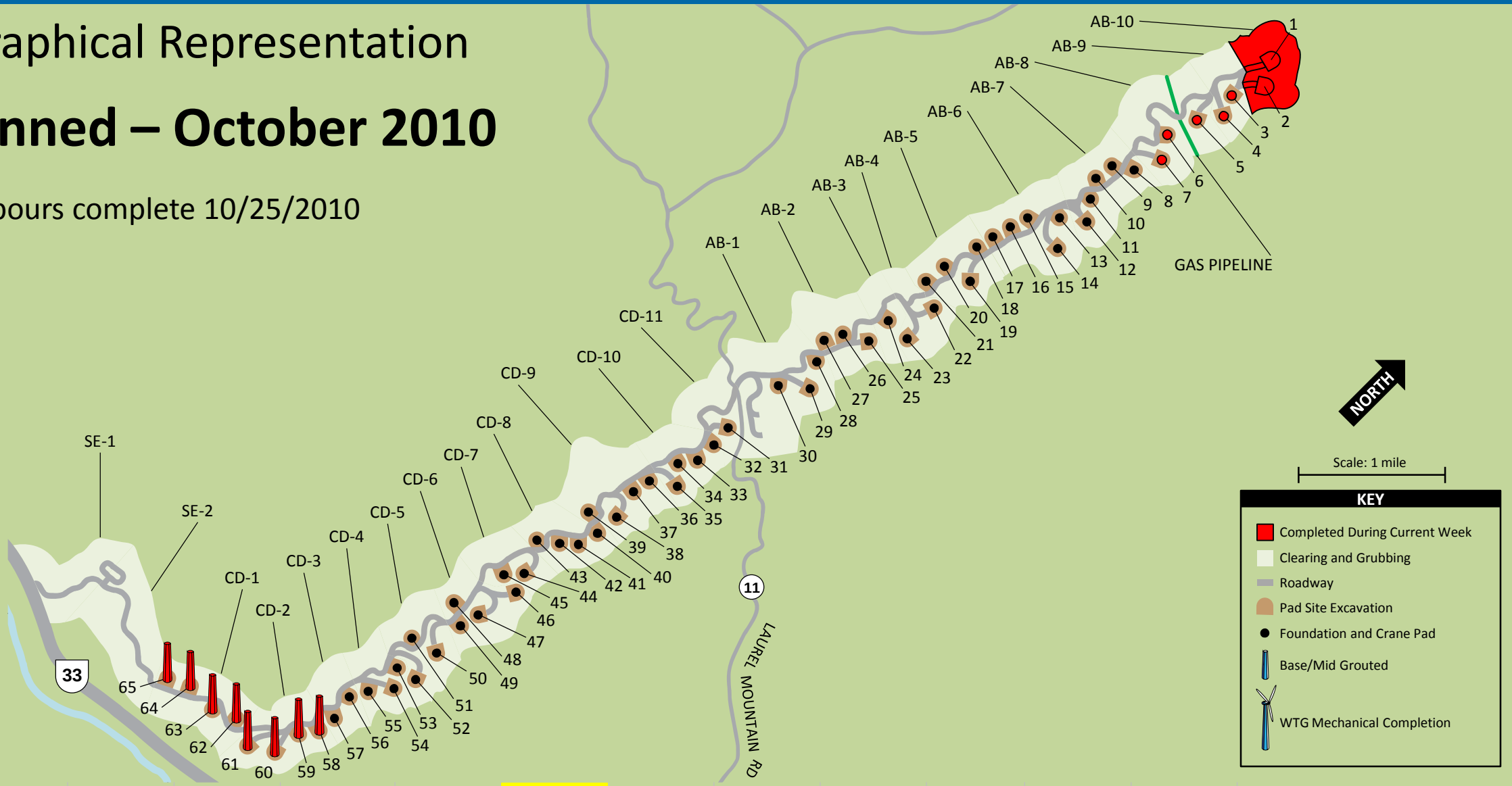
17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – October 2010

- Concrete pours complete 10/25/2010



WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

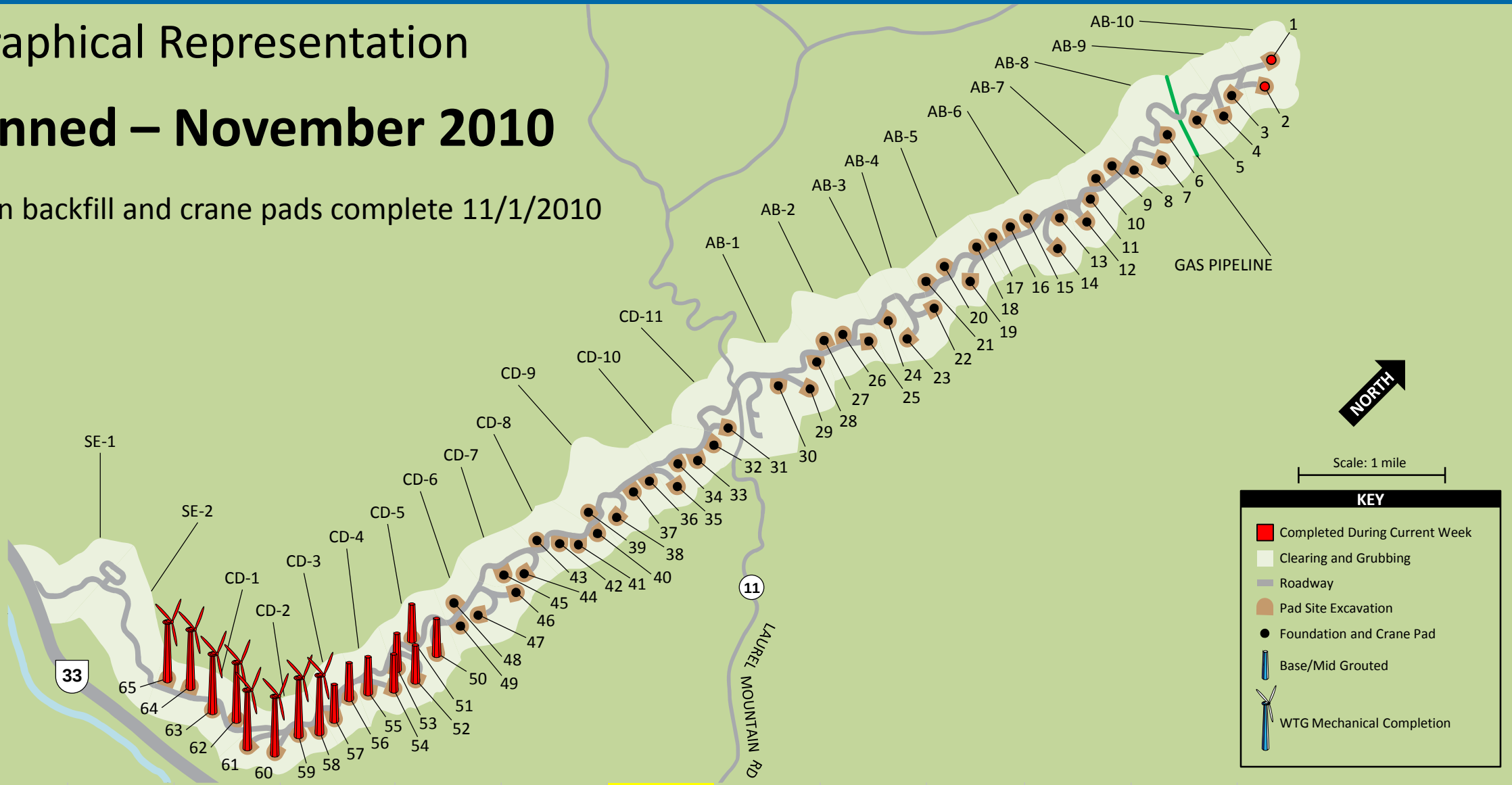
17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – November 2010

- Foundation backfill and crane pads complete 11/1/2010



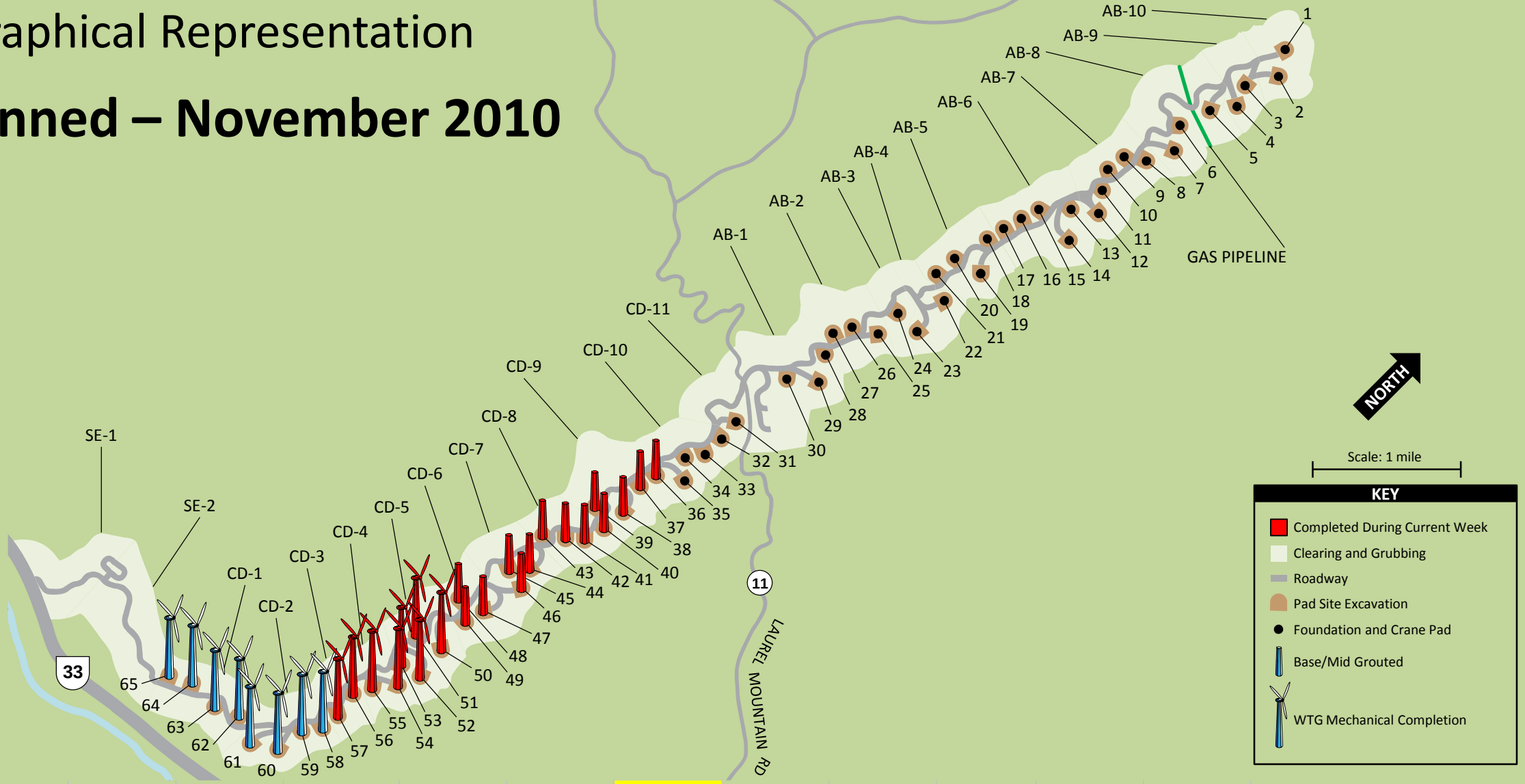
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – November 2010



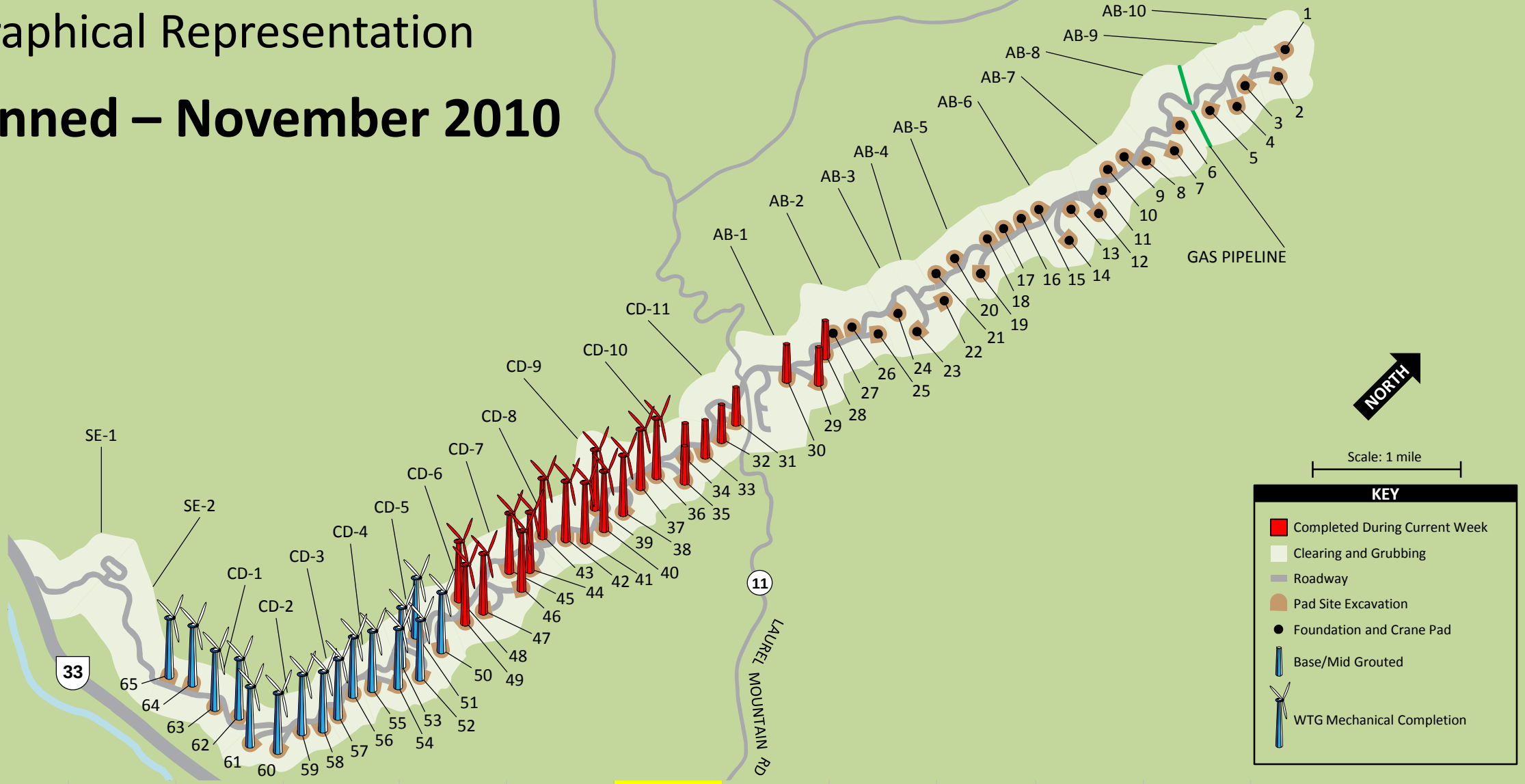
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – November 2010



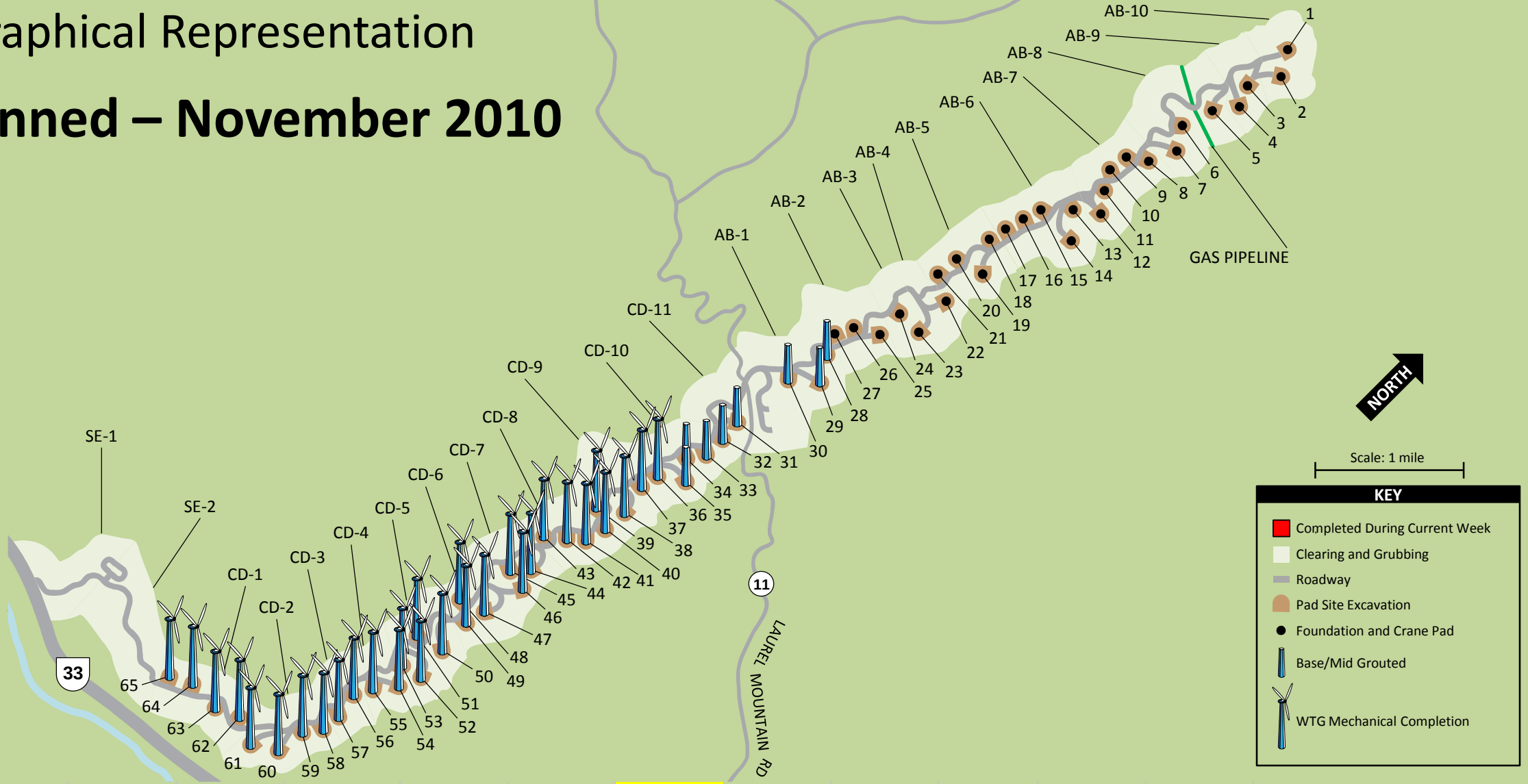
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – November 2010



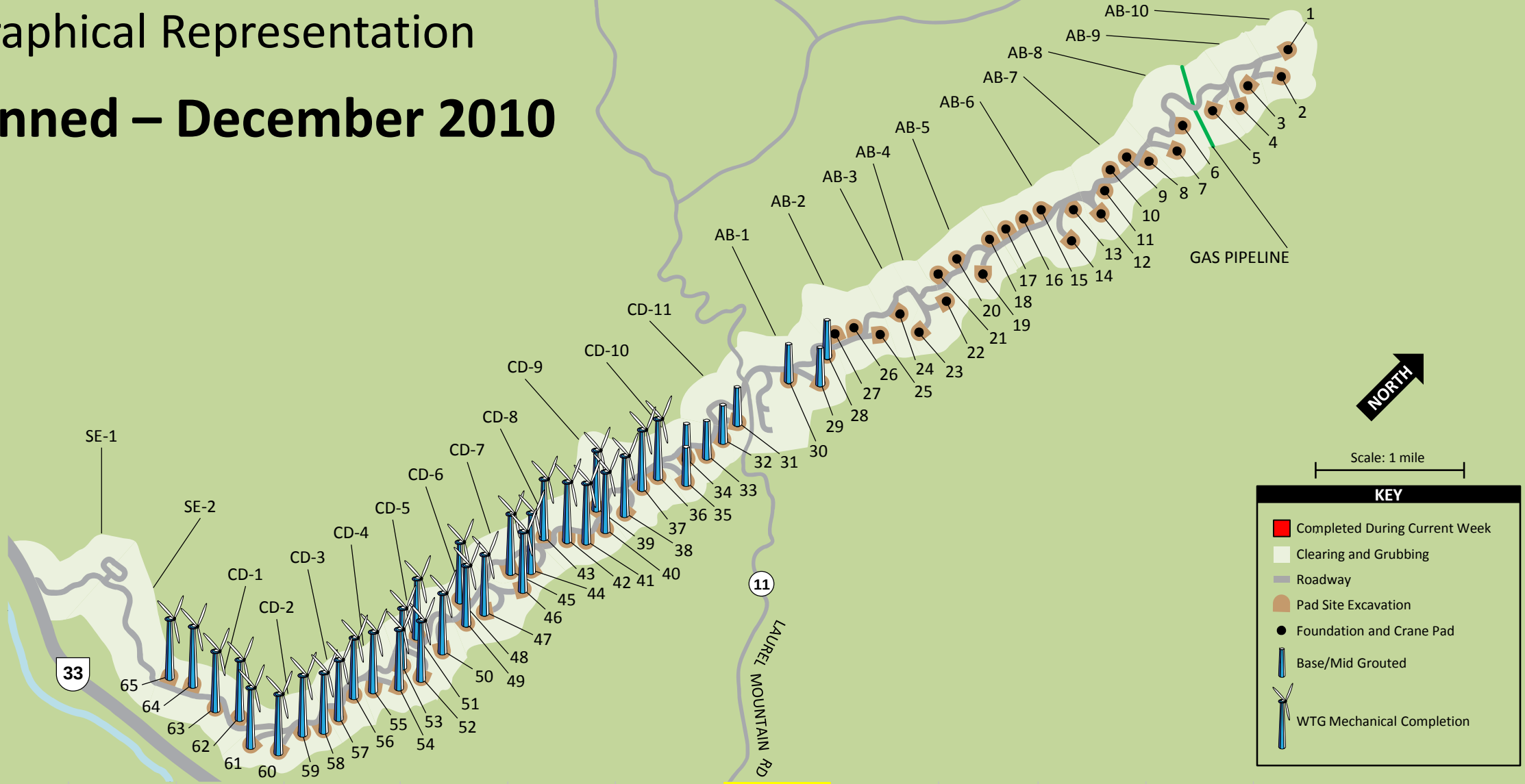
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – December 2010



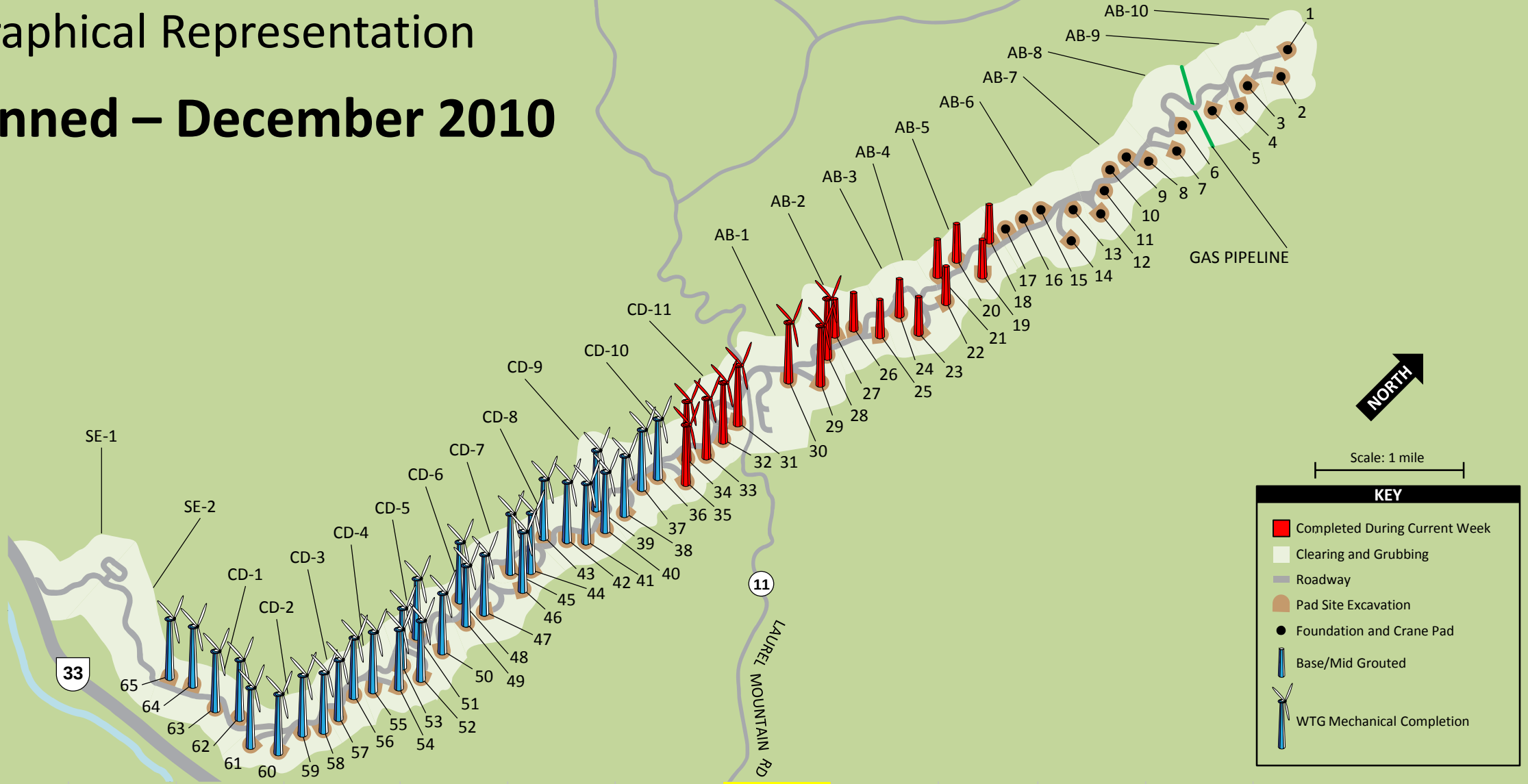
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – December 2010



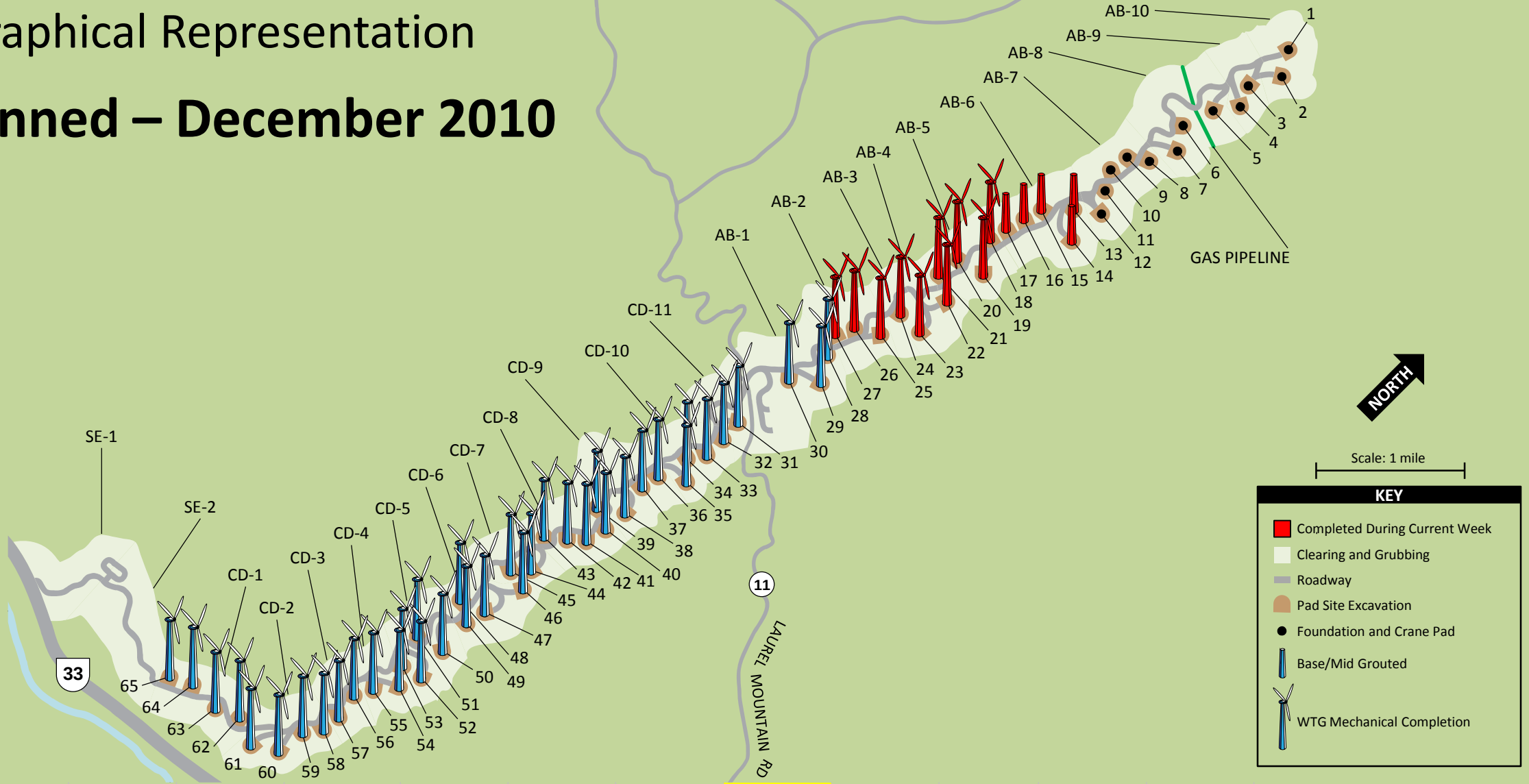
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – December 2010



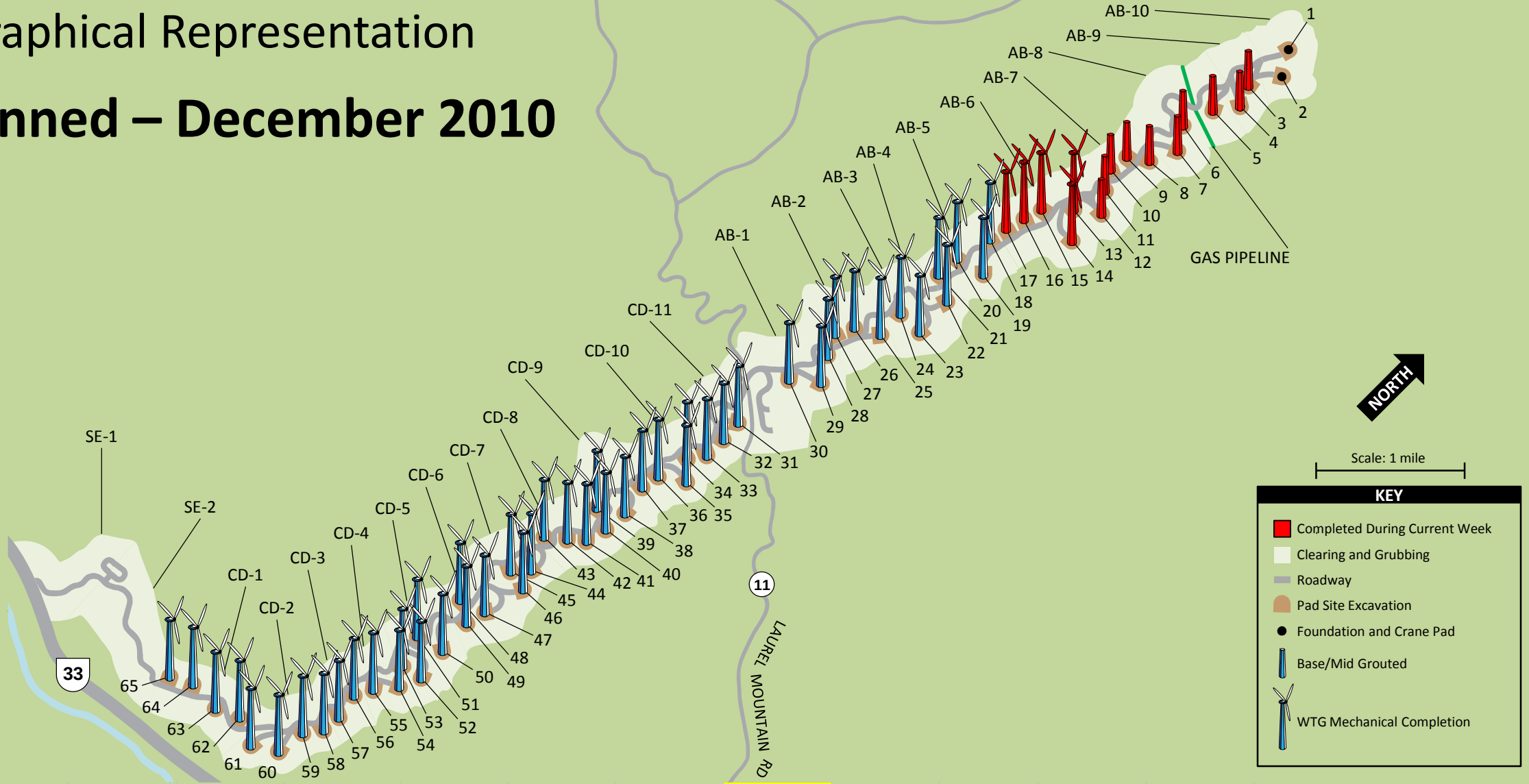
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – December 2010



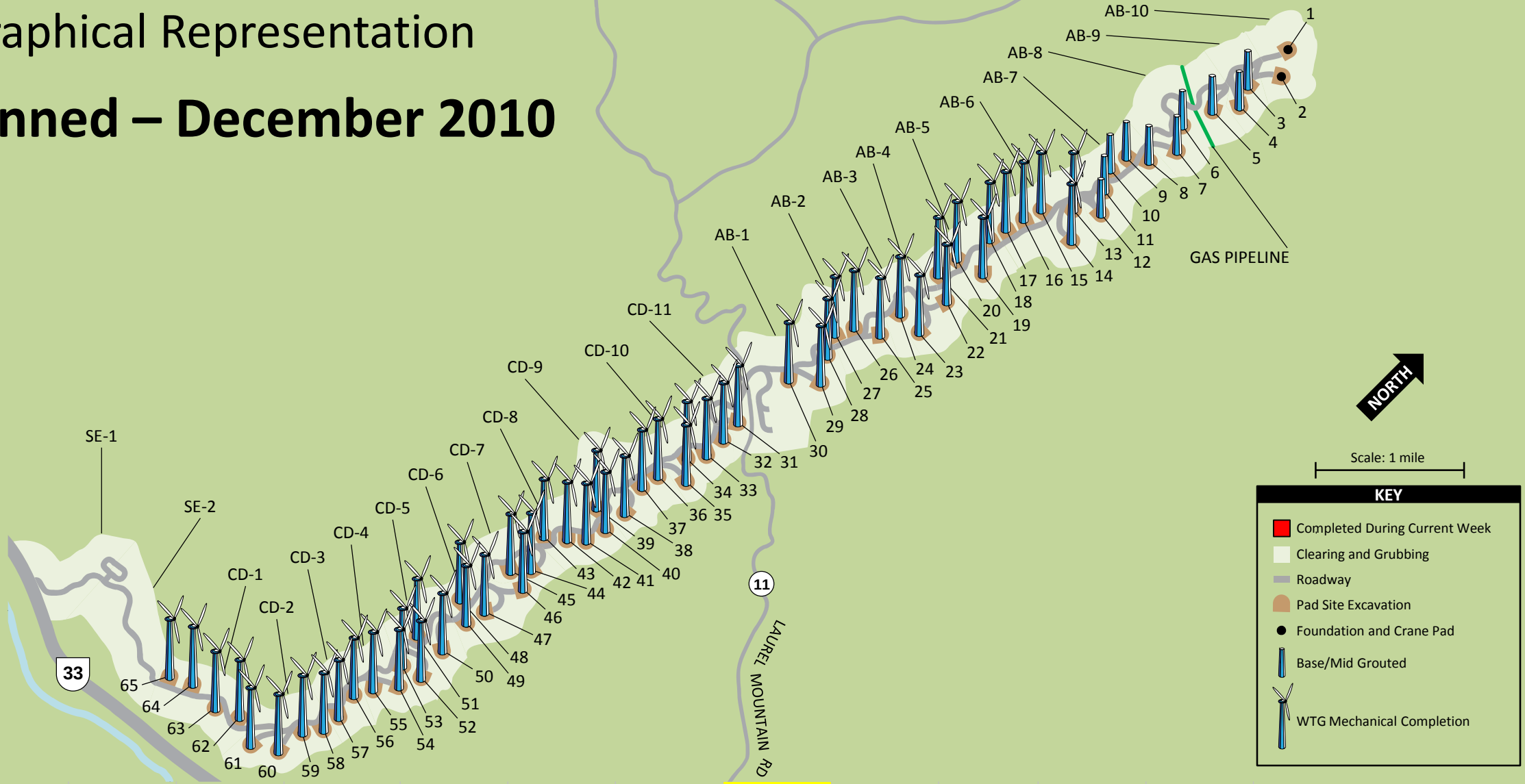
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – December 2010



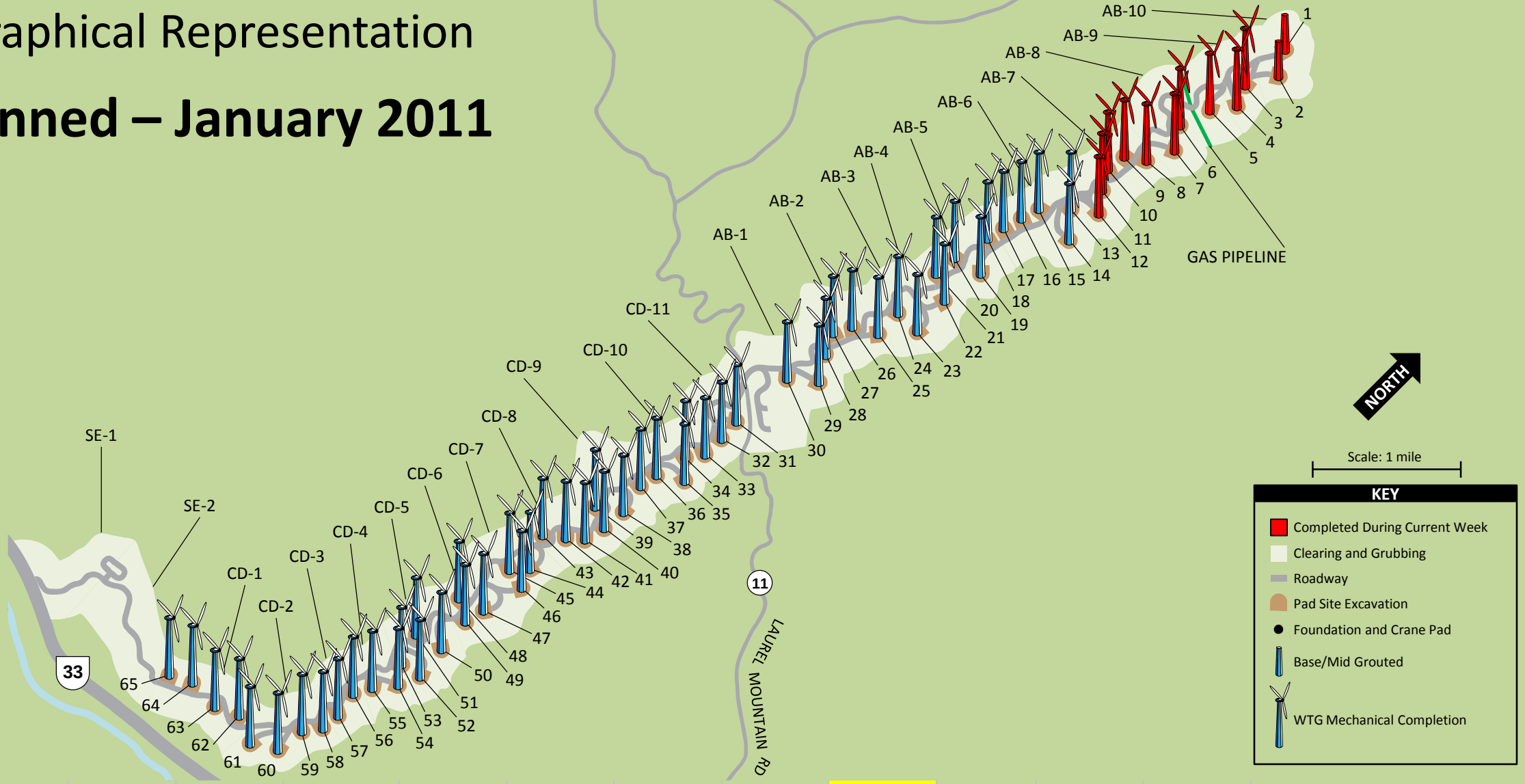
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – January 2011



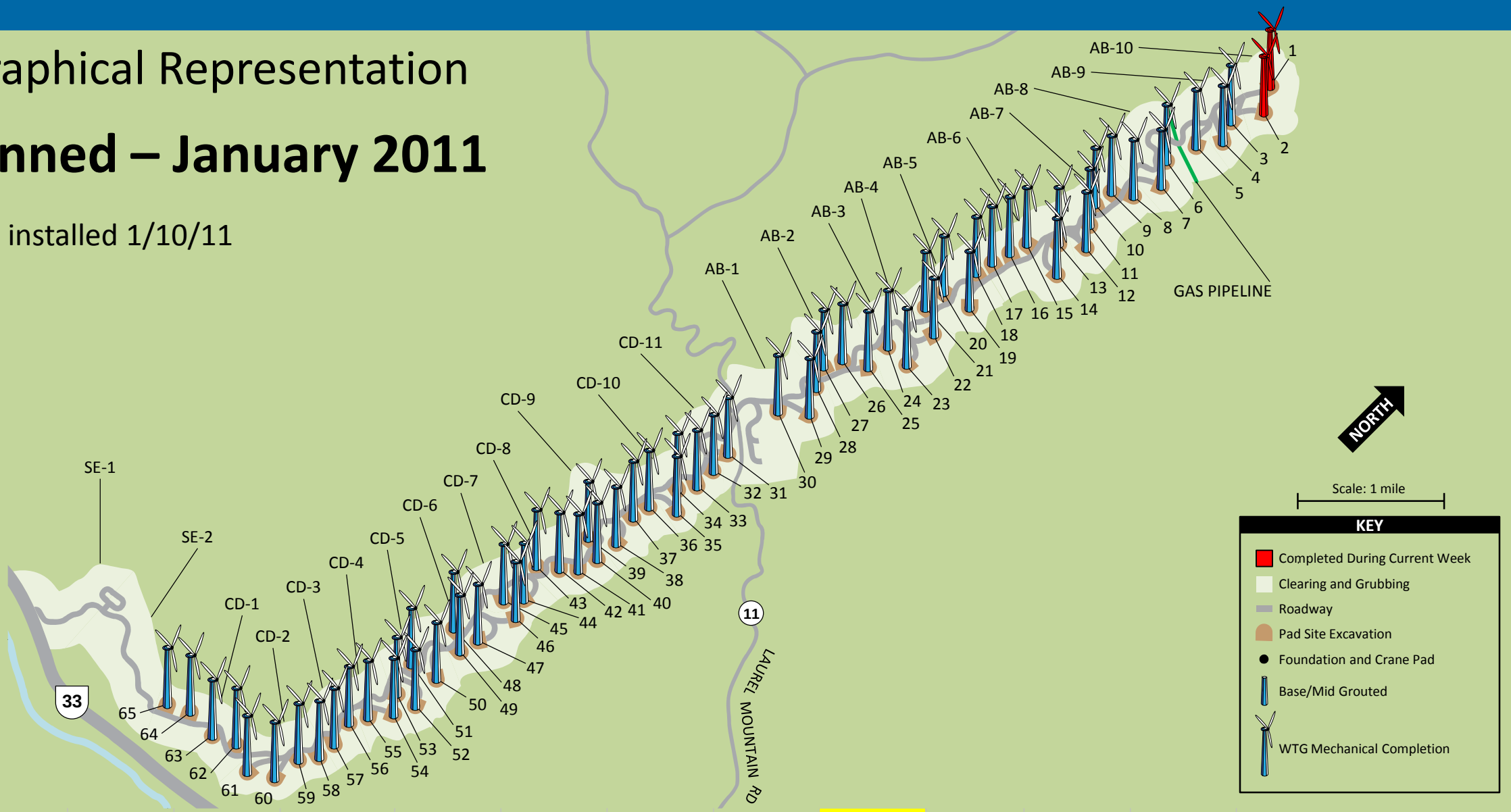
WEEKS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9
		JUN 2010					JUL 2010					AUG 2010					SEP 2010					OCT 2010					NOV 2010					DEC 2010					JAN 2011					FEB 2011					MAR 2011					APR 2011					

III.A. Graphical Representation

As-Planned – January 2011

- Final rotor installed 1/10/11



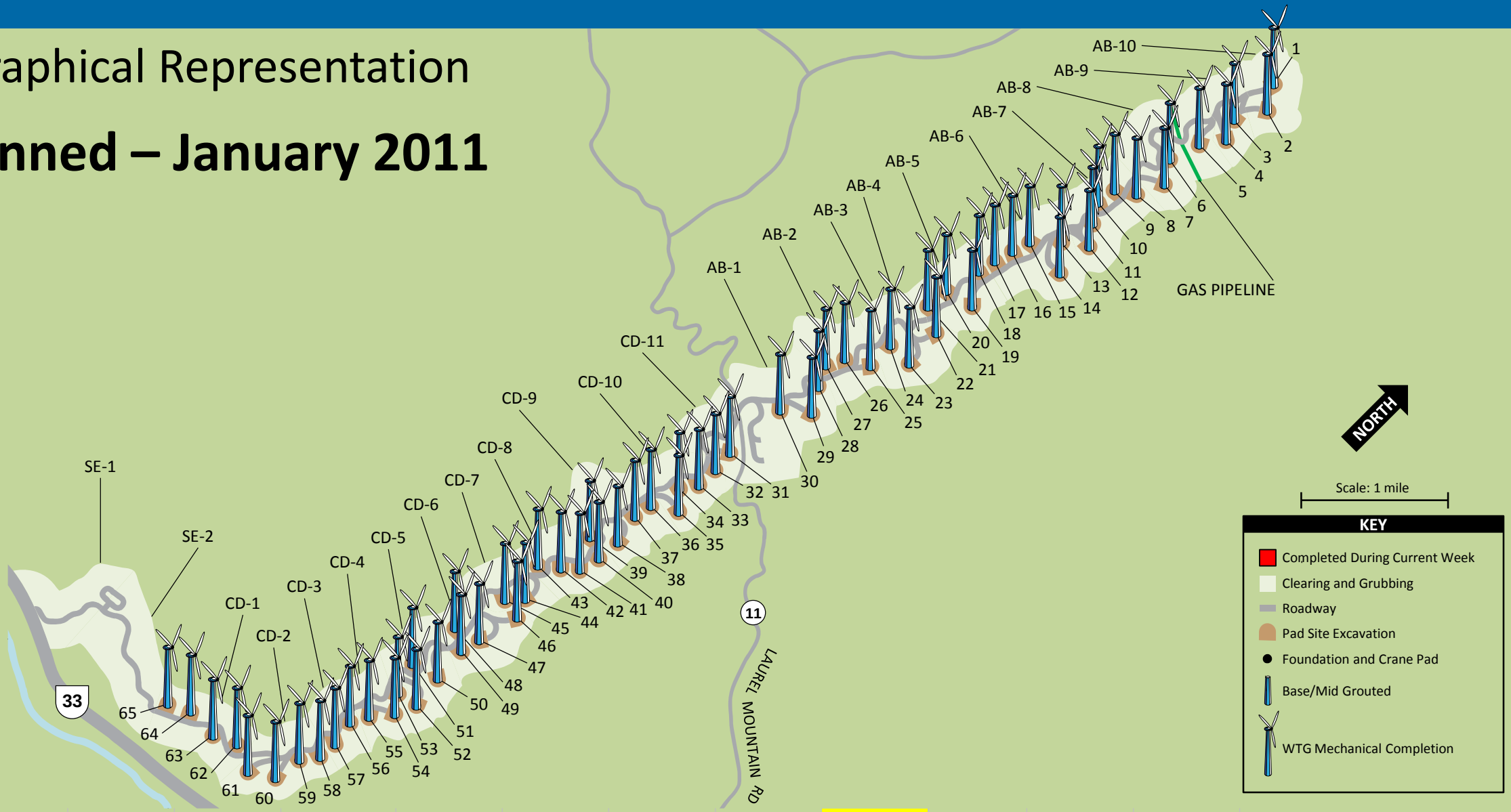
WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 6 13 20 27 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21 28 7 14 21 28 4 11 18 25 2 9

JUN 2010 | JUL 2010 | AUG 2010 | SEP 2010 | OCT 2010 | NOV 2010 | DEC 2010 | JAN 2011 | FEB 2011 | MAR 2011 | APR 2011

III.A. Graphical Representation

As-Planned – January 2011

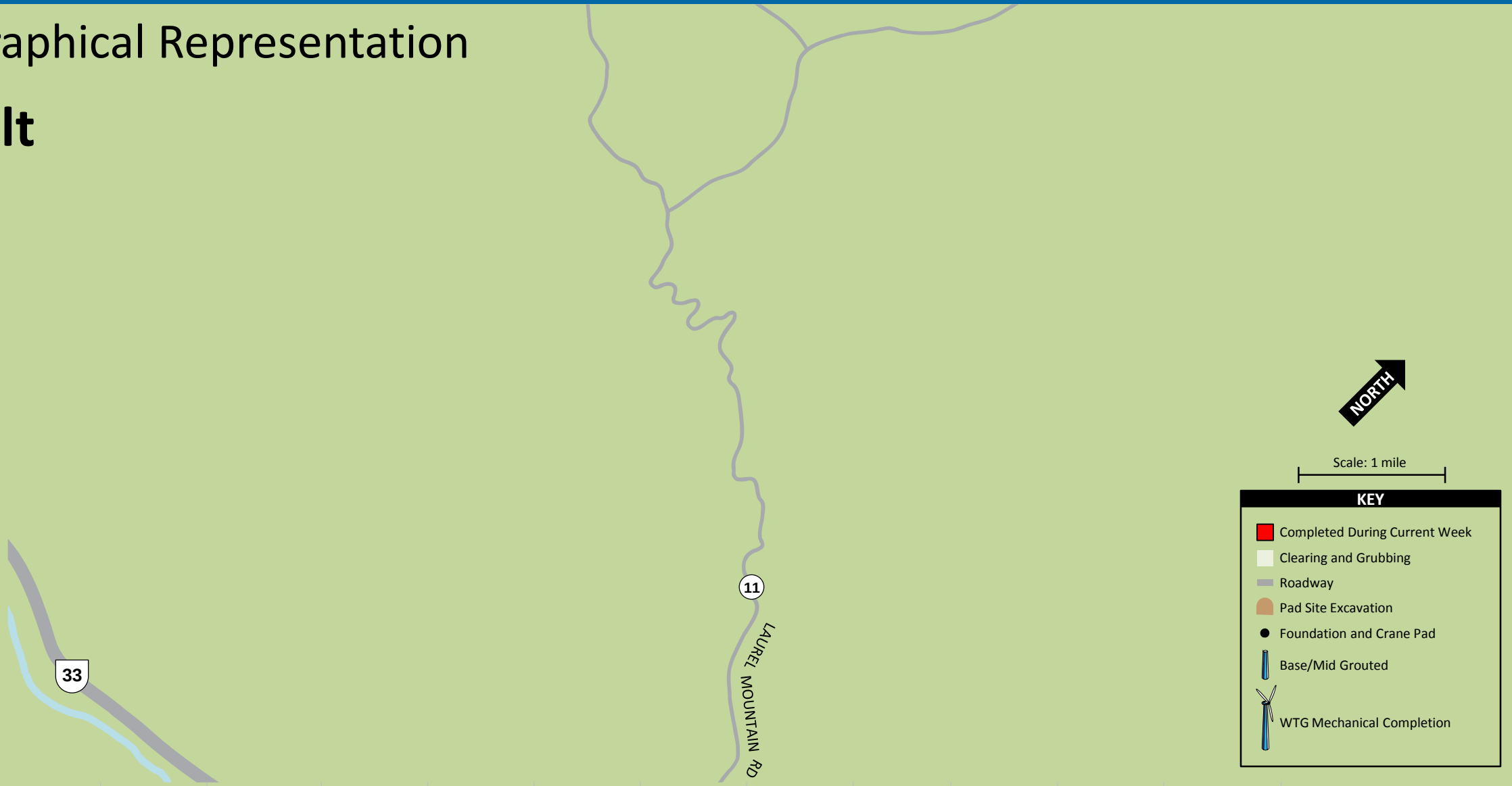


WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9
		JUN 2010					JUL 2010					AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011					MAR 2011					APR 2011				

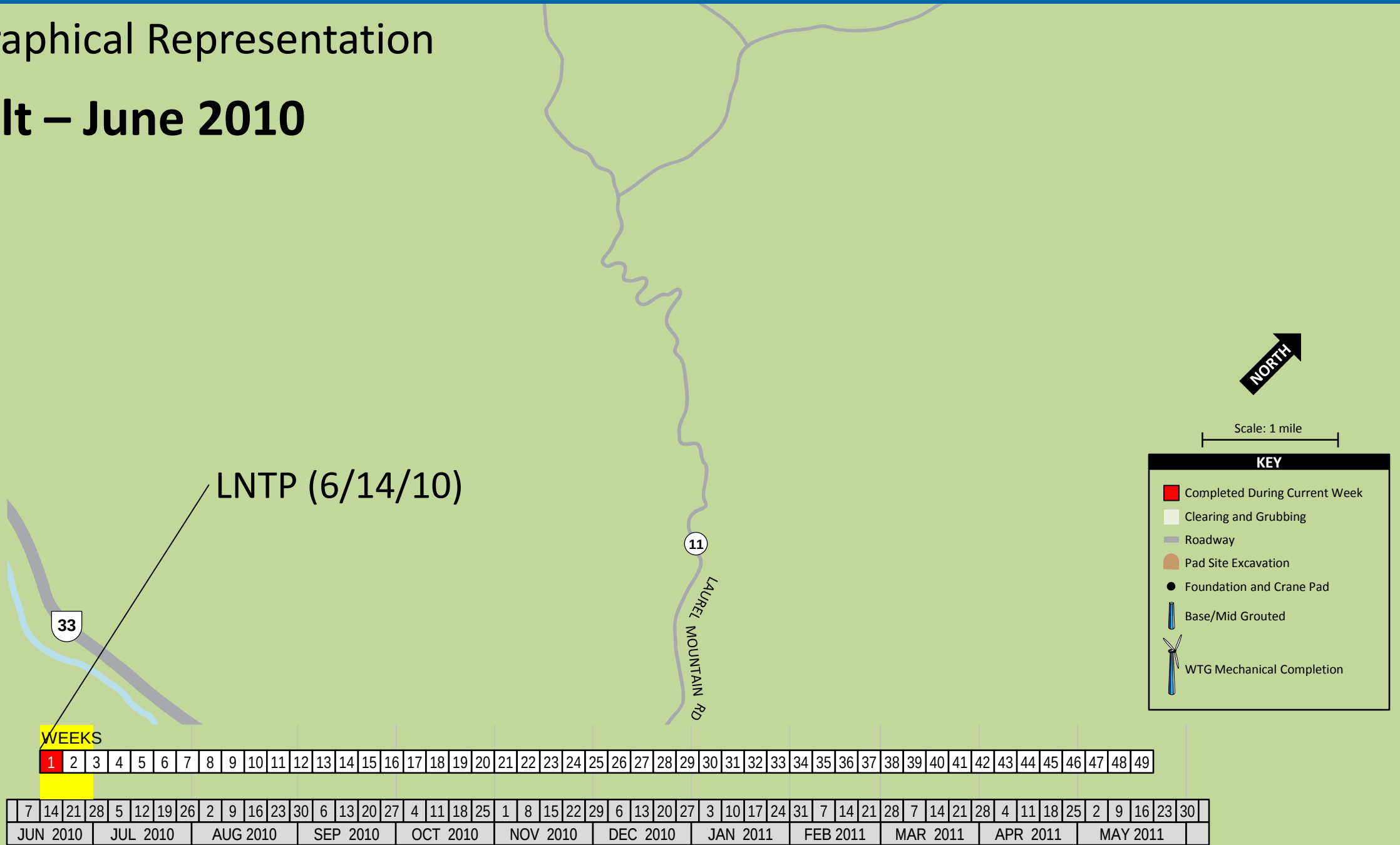
III.A. Graphical Representation

As-Built



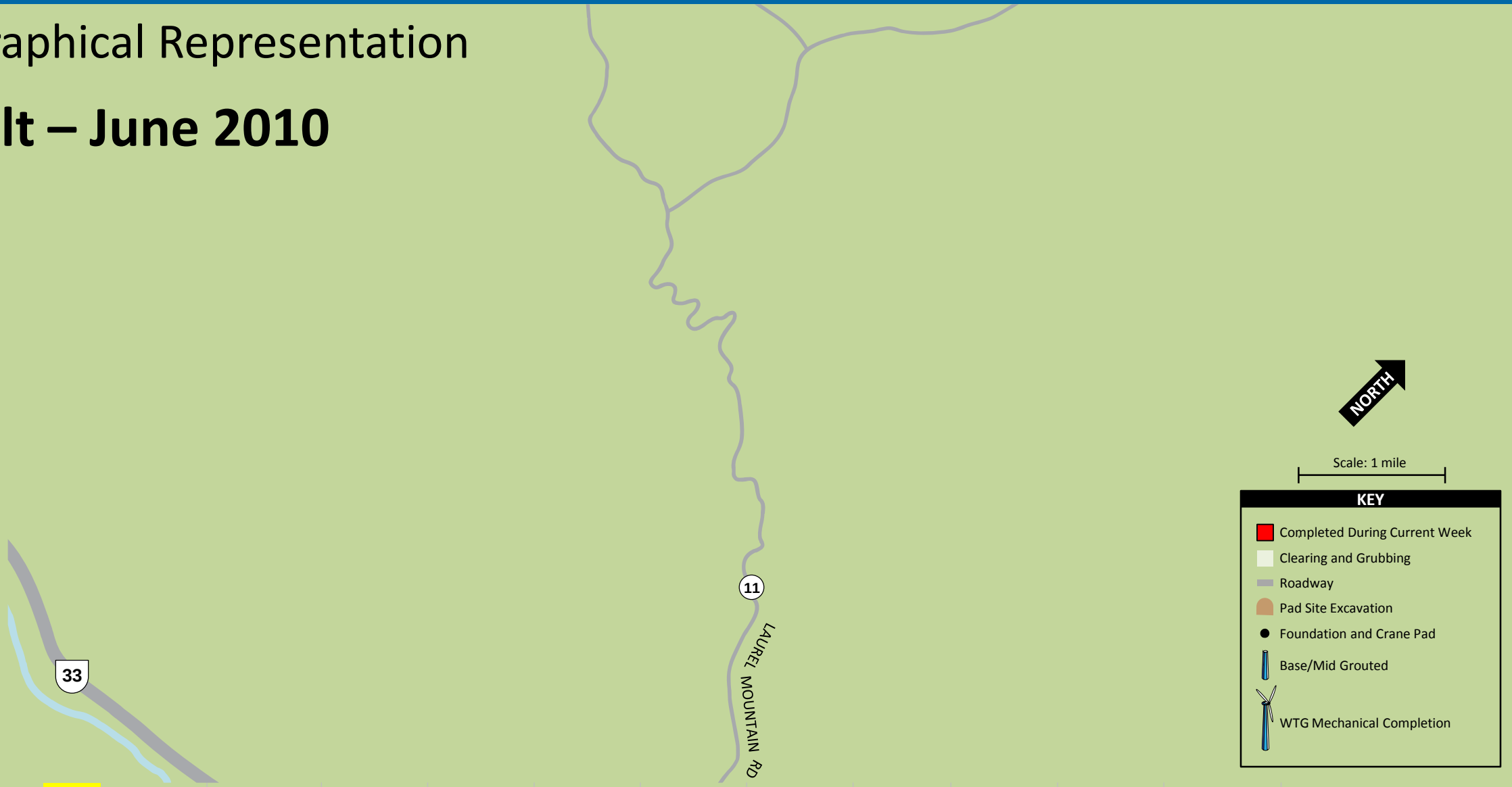
III.A. Graphical Representation

As-Built – June 2010



III.A. Graphical Representation

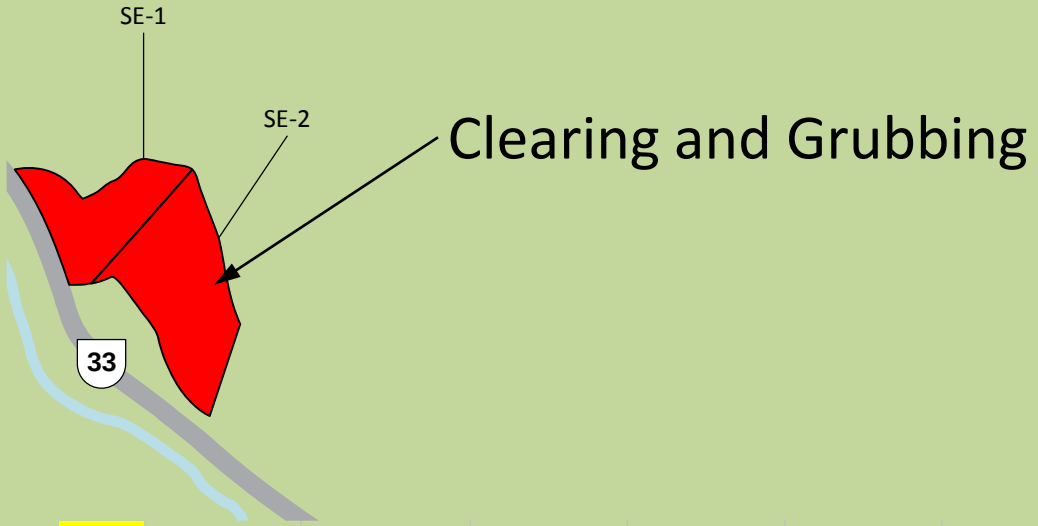
As-Built – June 2010



III.A. Graphical Representation

As-Built – June 2010

- Site Issues
  - Logging SE1 / SE2
  - Lack of fill



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

WEEKS

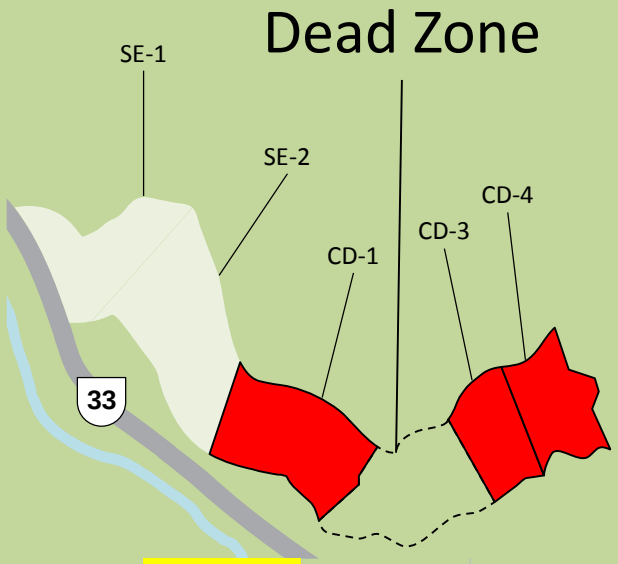
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – July 2010



Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

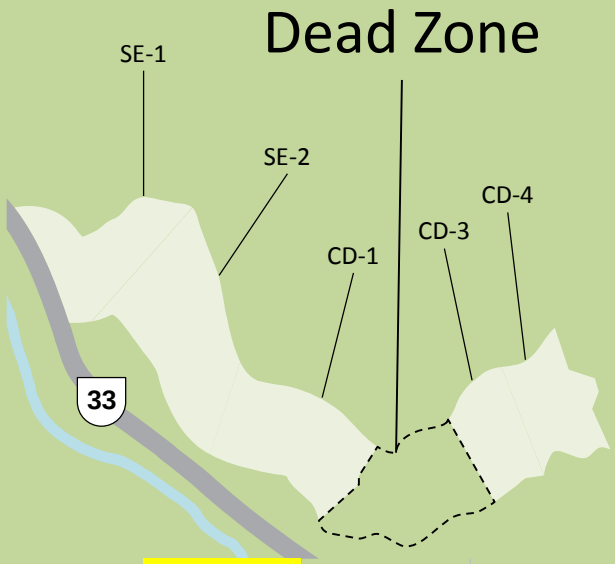
WEEKS

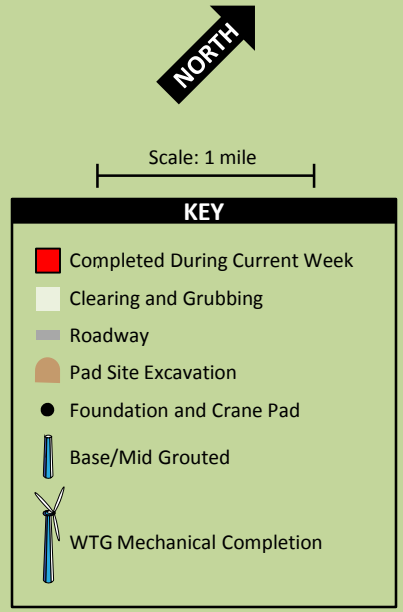
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011				FEB 2011				MAR 2011				APR 2011				MAY 2011				

III.A. Graphical Representation

As-Built – July 2010





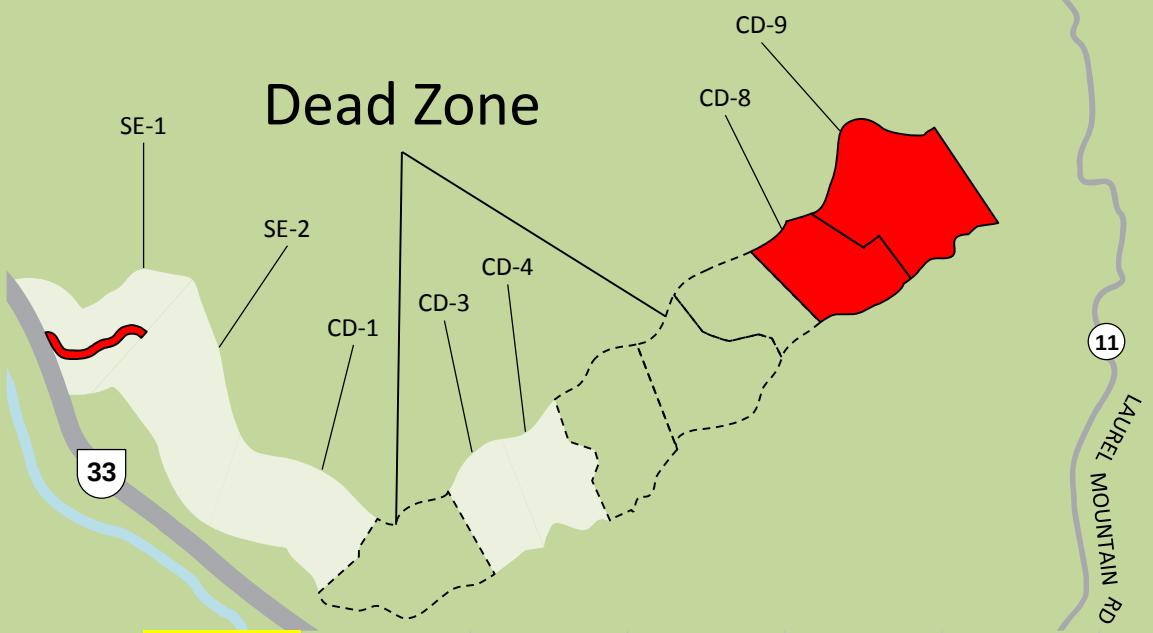
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011				FEB 2011				MAR 2011				APR 2011				MAY 2011				

III.A. Graphical Representation

As-Built – July 2010



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

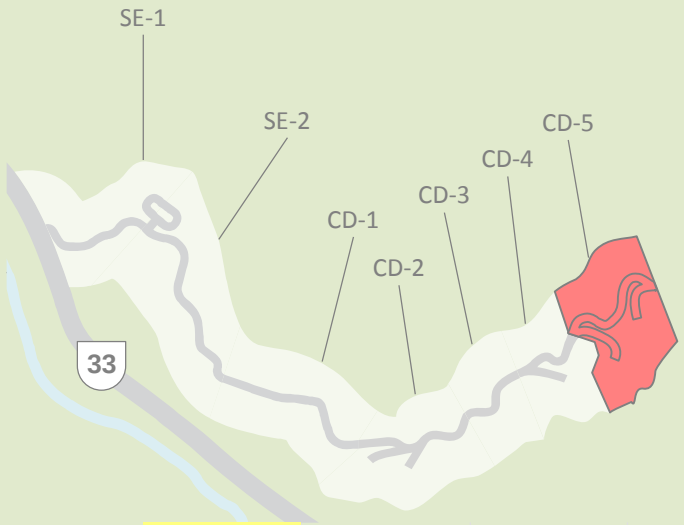
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011				FEB 2011				MAR 2011				APR 2011				MAY 2011				

III.A. Graphical Representation

As-Planned – July 2010



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

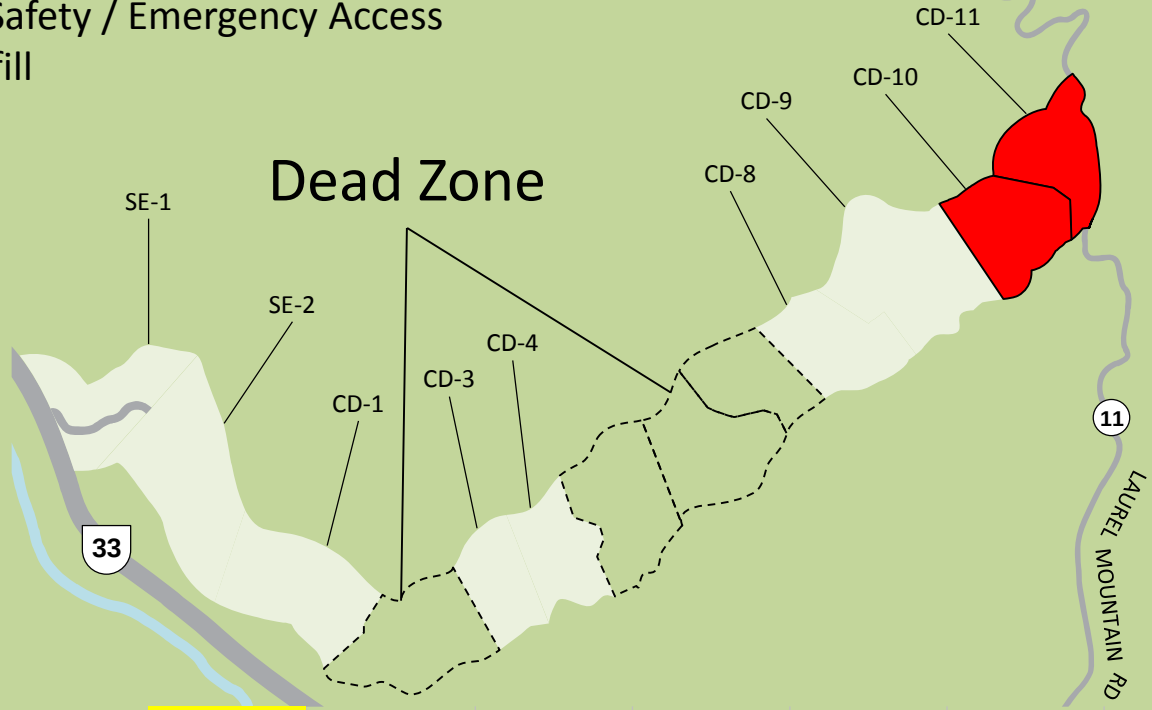
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – July 2010

- Site Issues
  - CD-2 Dead Zone
  - CD-5,6,7 Dead Zone
  - CD-3,4 Safety / Emergency Access
  - Lack of fill



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

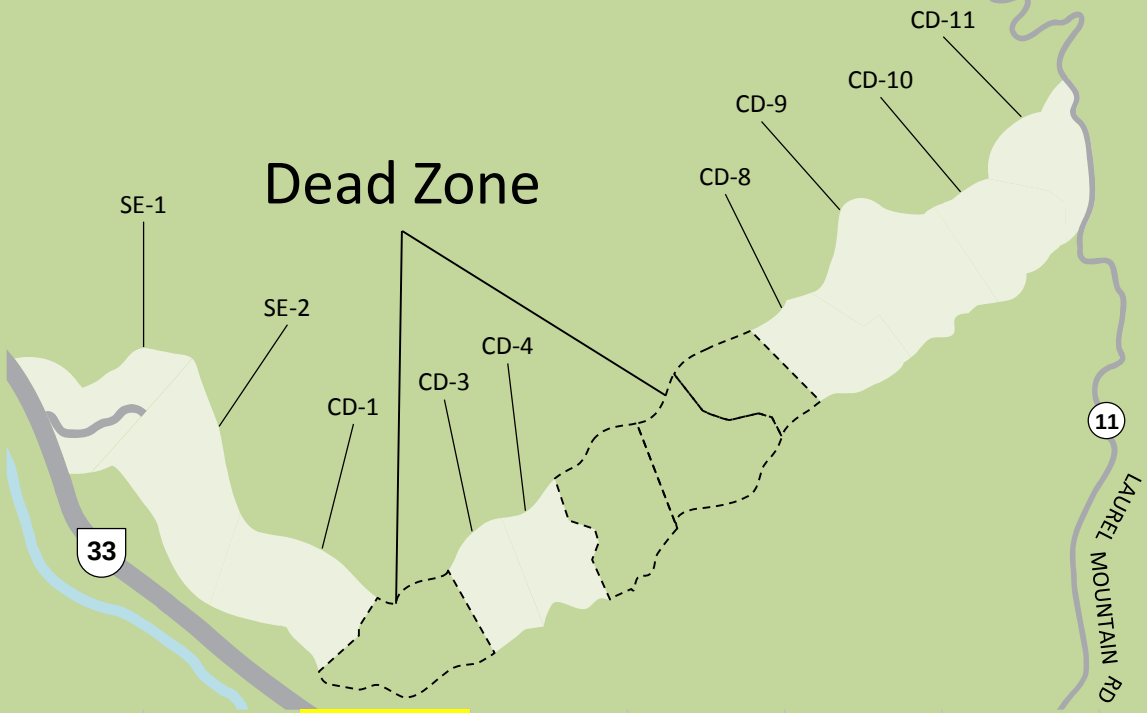
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011				FEB 2011				MAR 2011				APR 2011				MAY 2011				

III.A. Graphical Representation

As-Built – August 2010



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

WEEKS

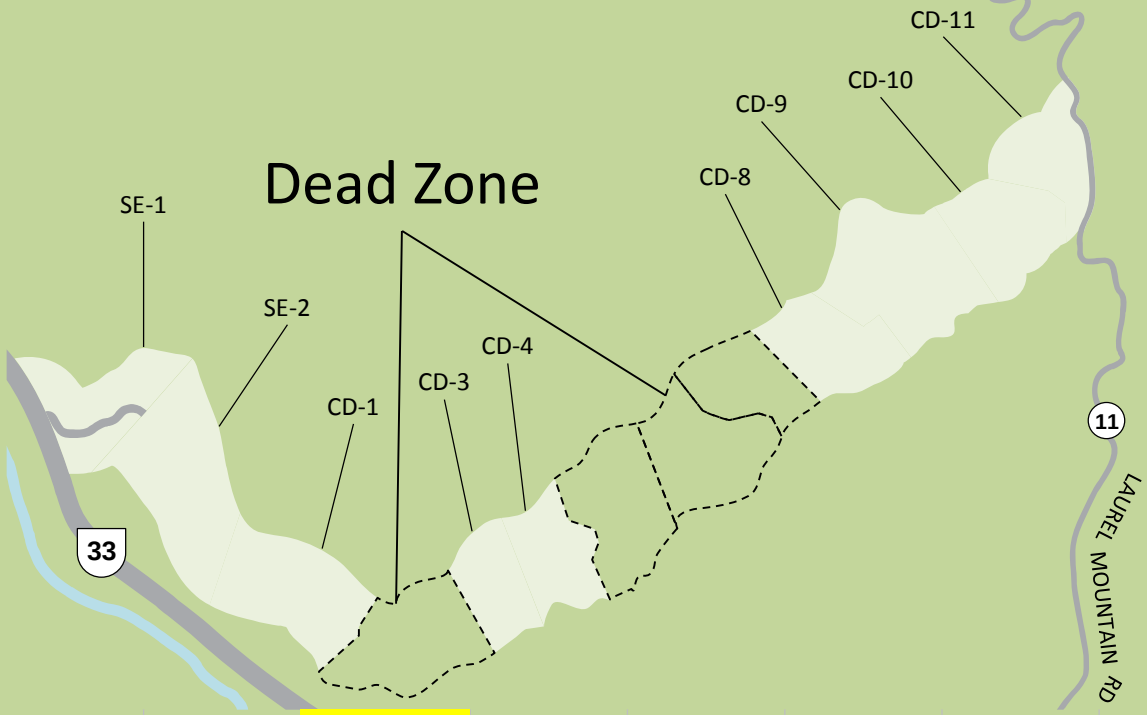
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – August 2010



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

WEEKS

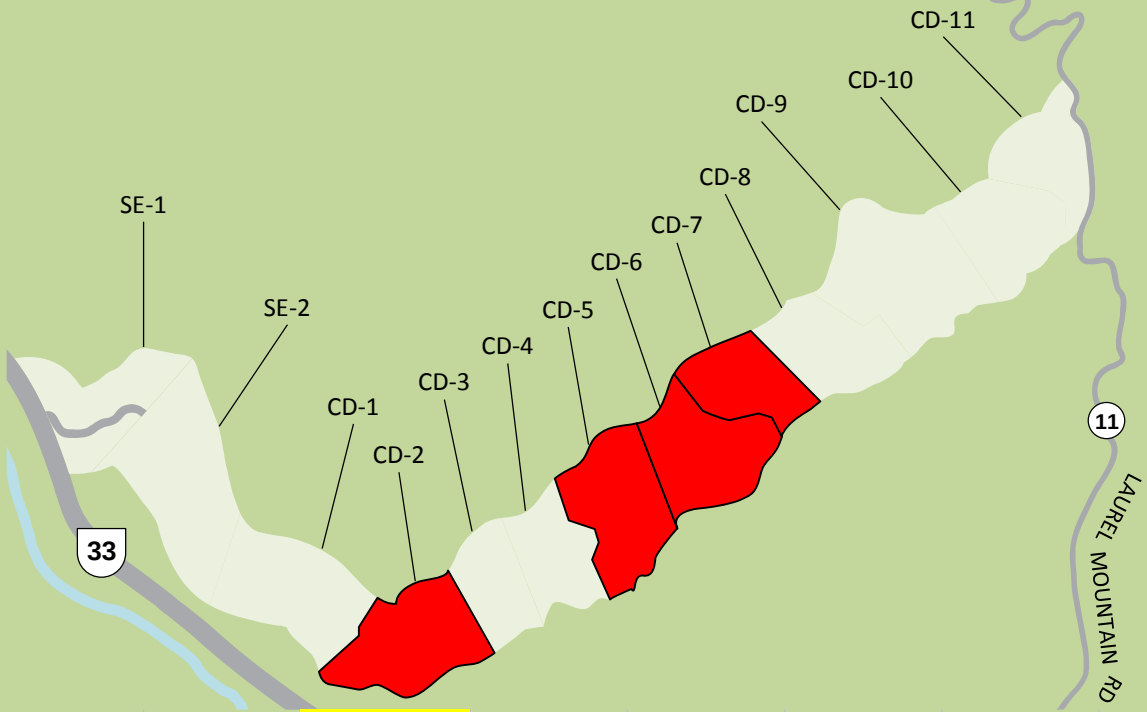
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – August 2010



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

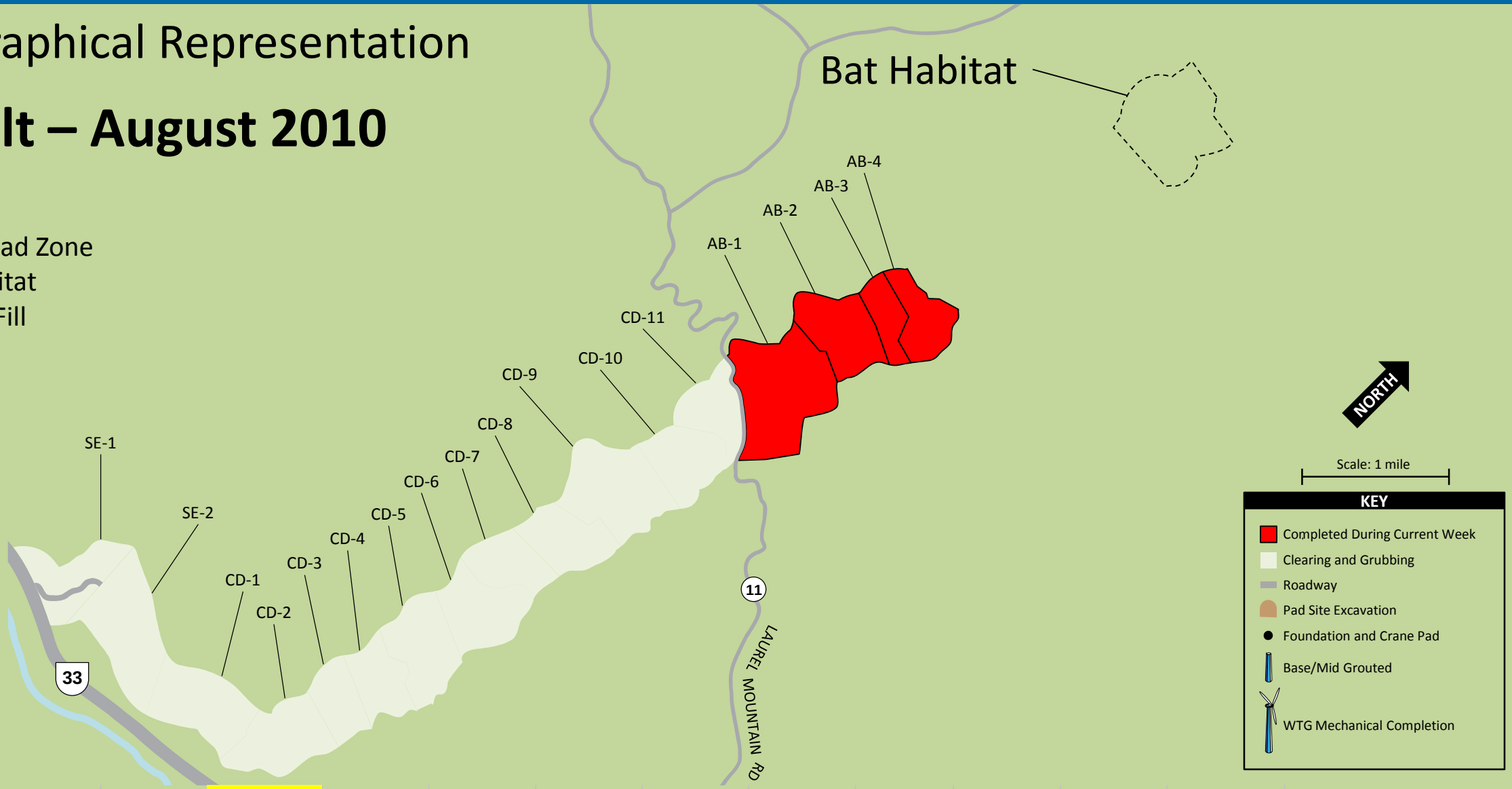
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – August 2010

- Site Issues
  - CD-2 Dead Zone
  - Bat Habitat
  - Lack of Fill



WEEKS

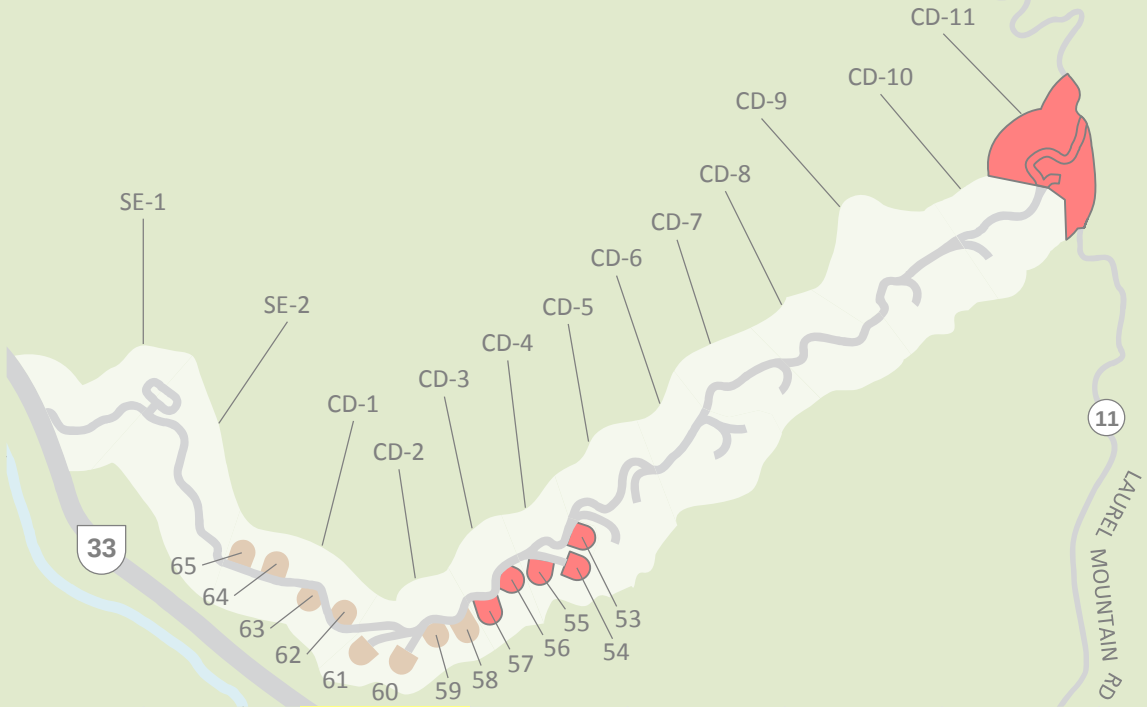
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Planned – August 2010



NORTH

Scale: 1 mile

KEY

- Completed During Current Week
- Clearing and Grubbing
- Roadway
- Pad Site Excavation
- Foundation and Crane Pad
- Base/Mid Grouted
- WTG Mechanical Completion

WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

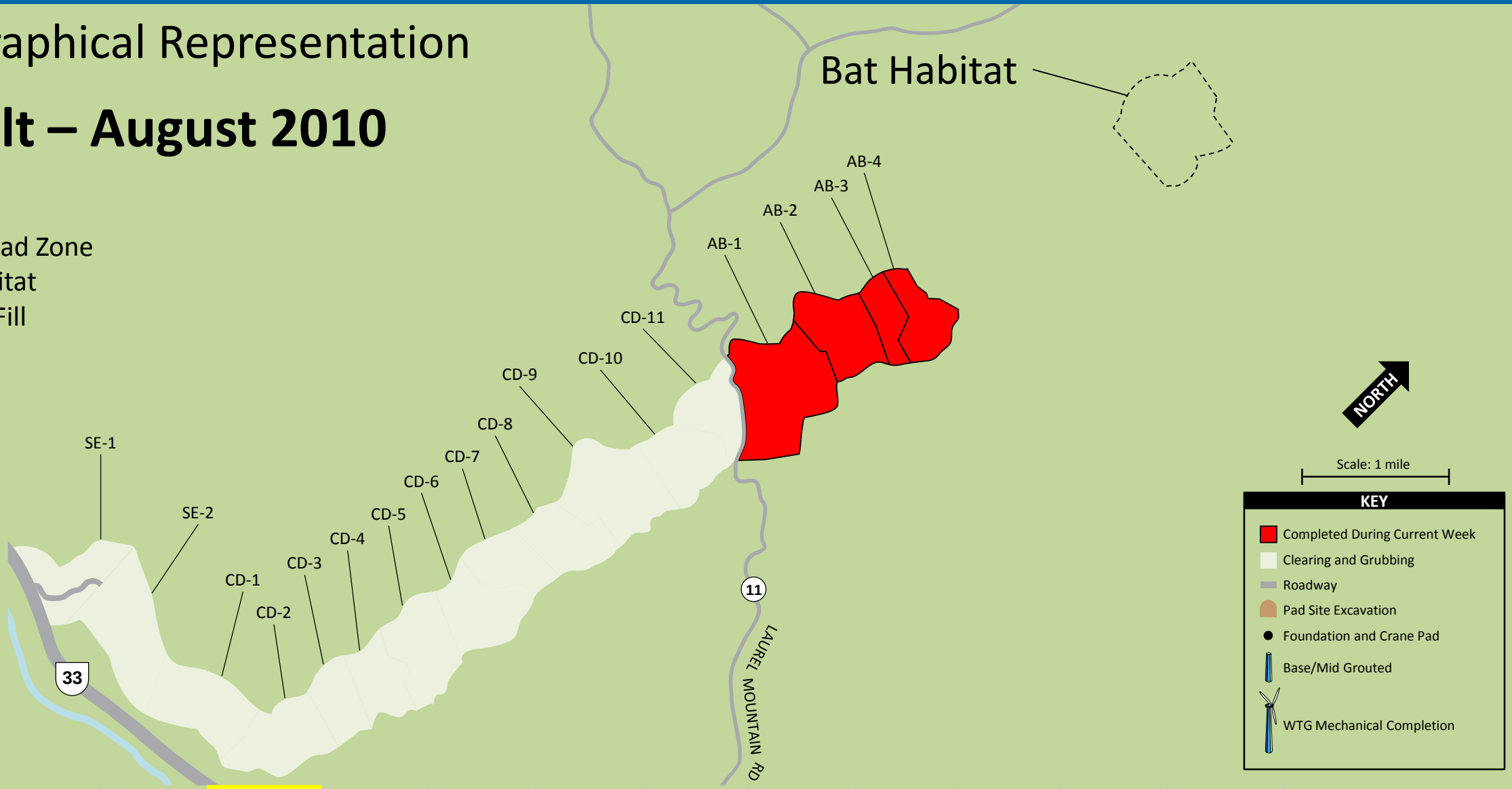
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – August 2010

- Site Issues
  - CD-2 Dead Zone
  - Bat Habitat
  - Lack of Fill



WEEKS

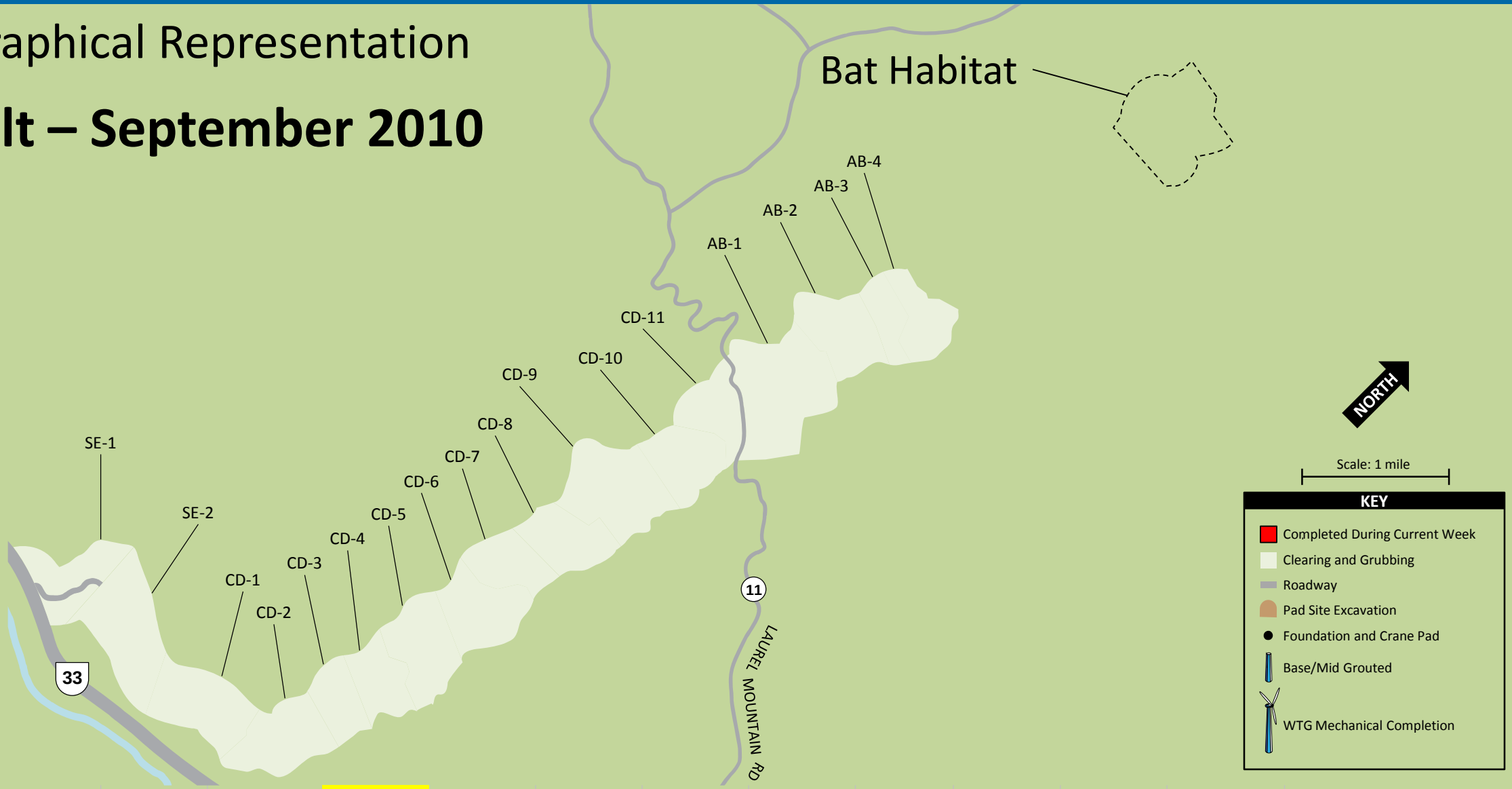
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – September 2010



WEEKS

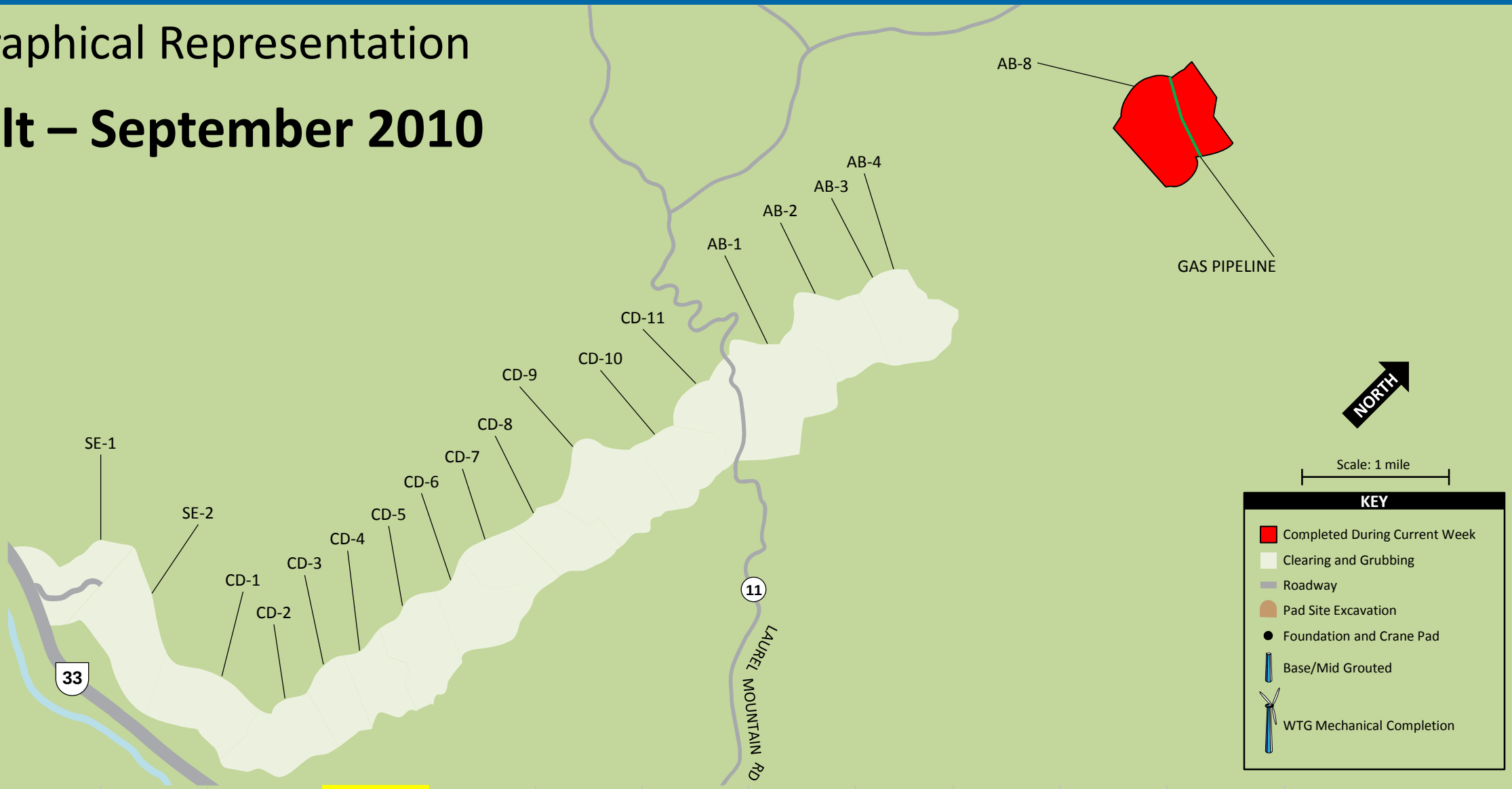
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – September 2010



WEEKS

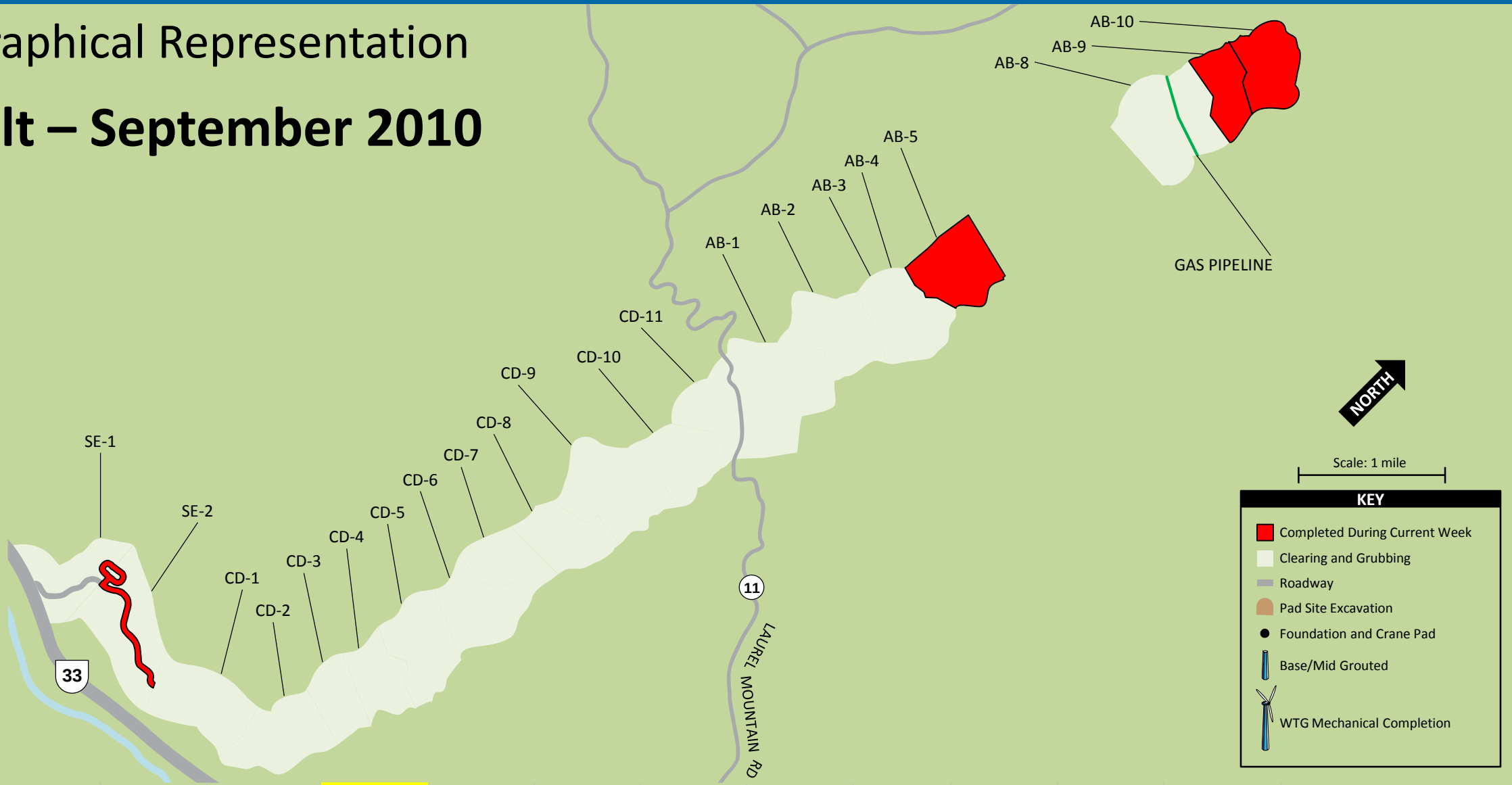
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – September 2010



WEEKS

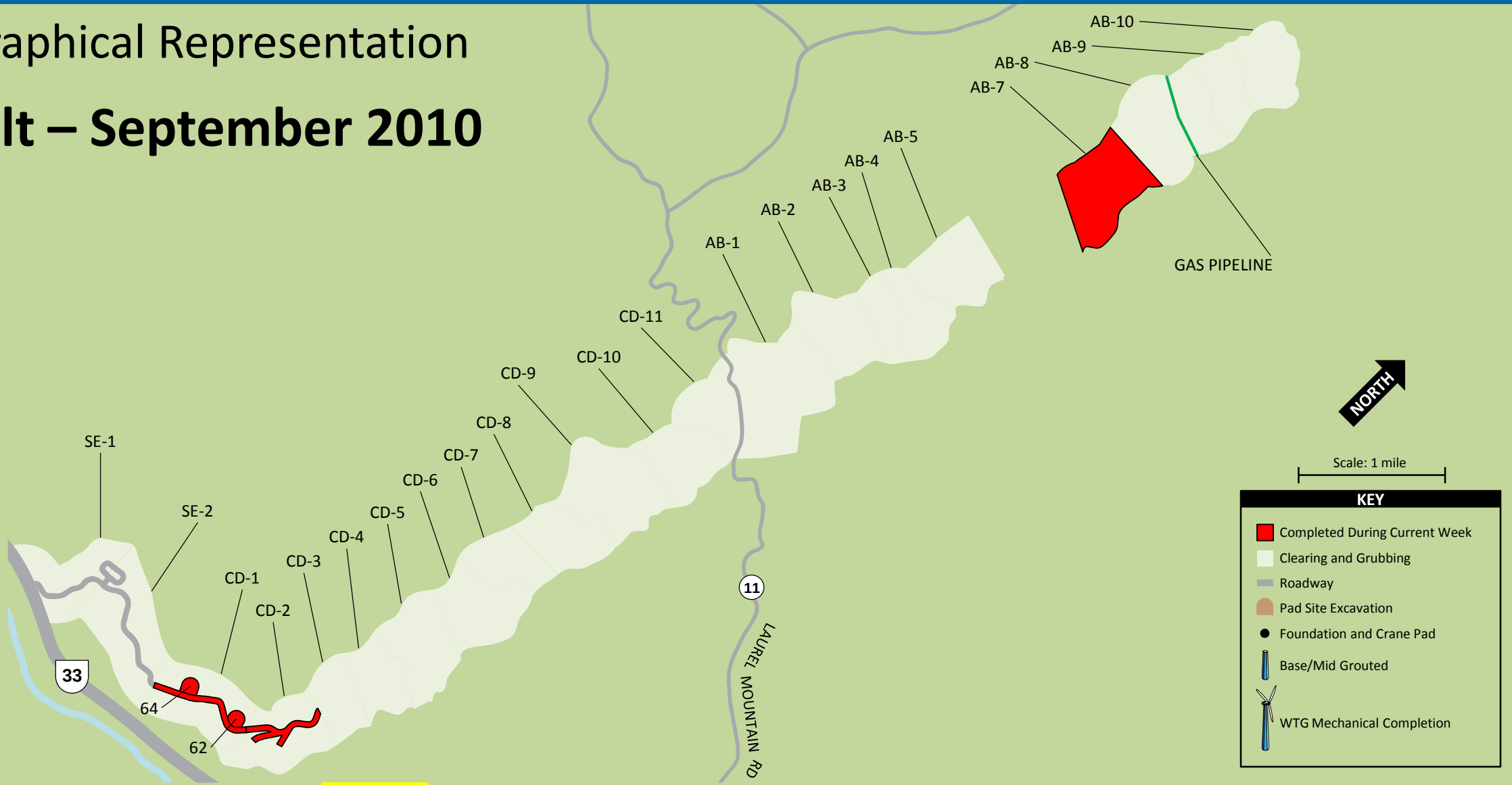
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – September 2010



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

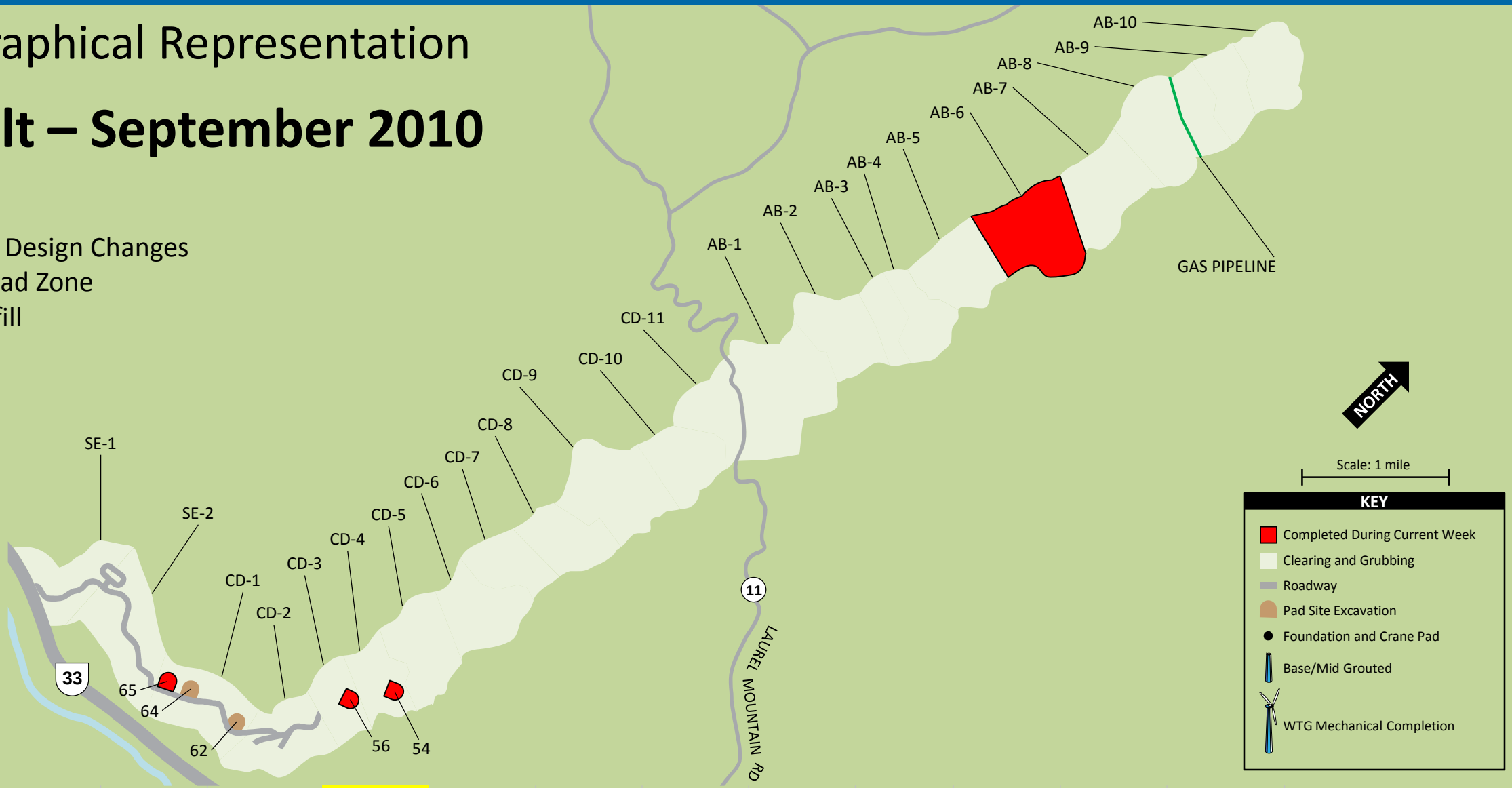
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – September 2010

- Site Issues
  - 1.6 MW Design Changes
  - CD-2 Dead Zone
  - Lack of fill



WEEKS

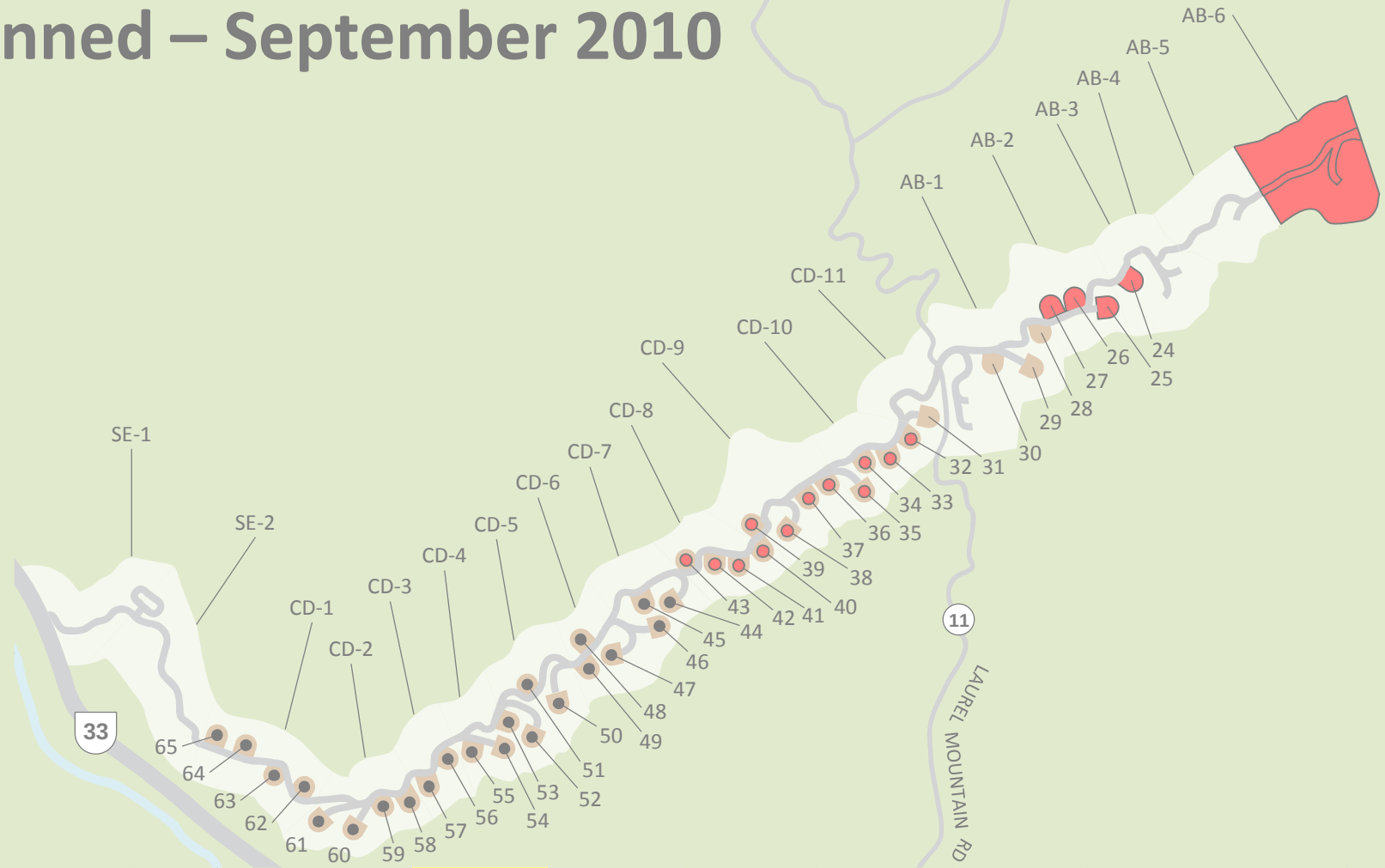
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

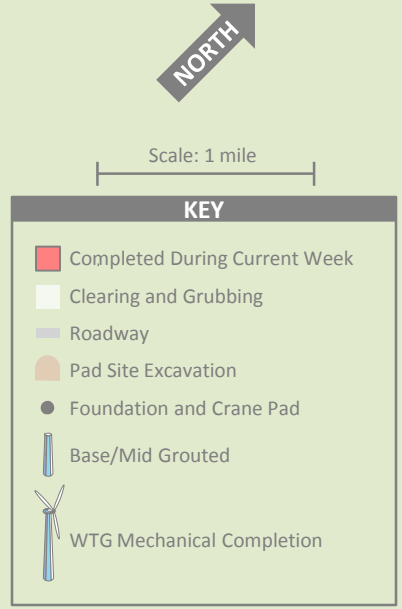
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Planned – September 2010





WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

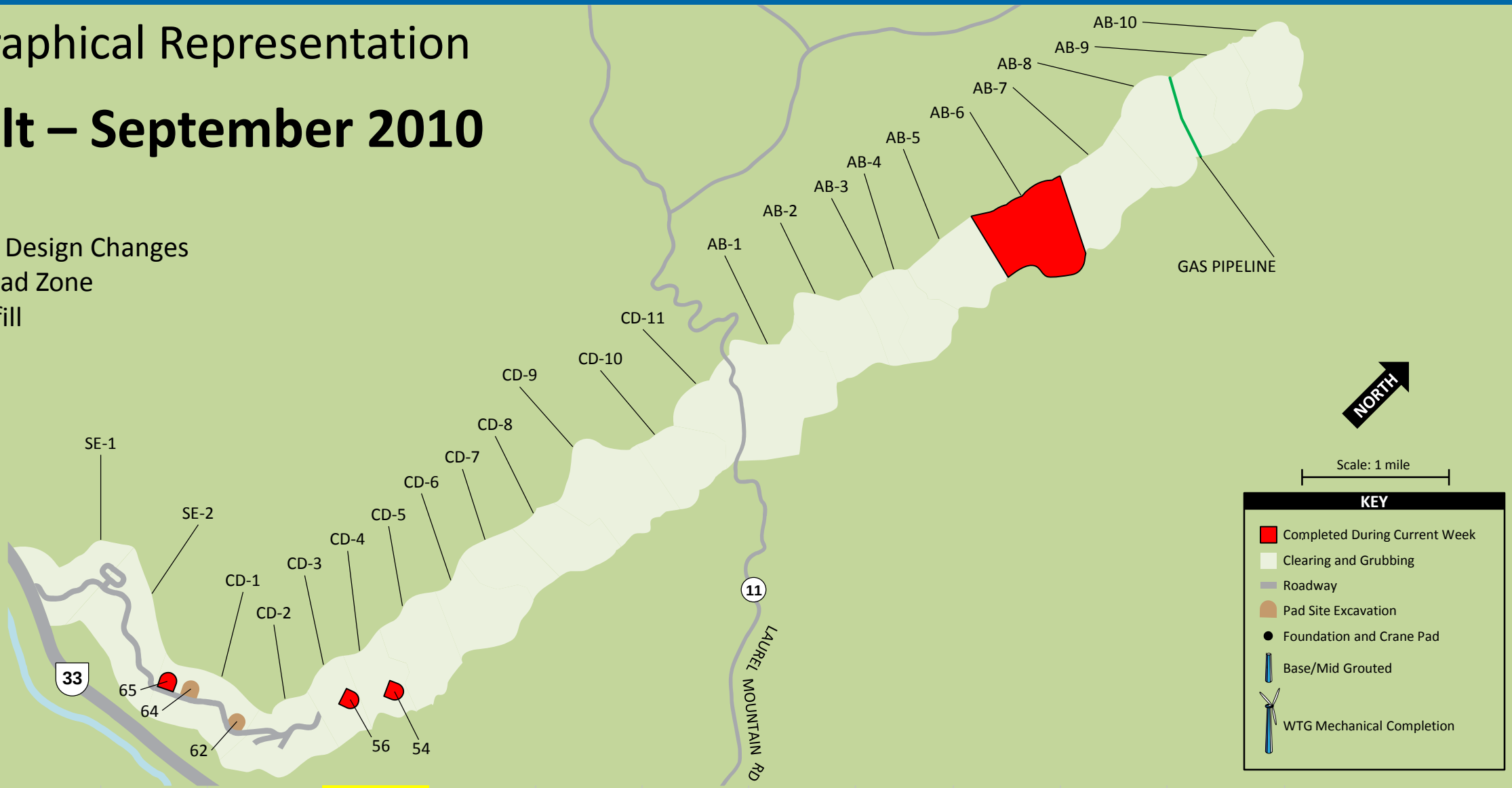
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – September 2010

- Site Issues
  - 1.6 MW Design Changes
  - CD-2 Dead Zone
  - Lack of fill



WEEKS

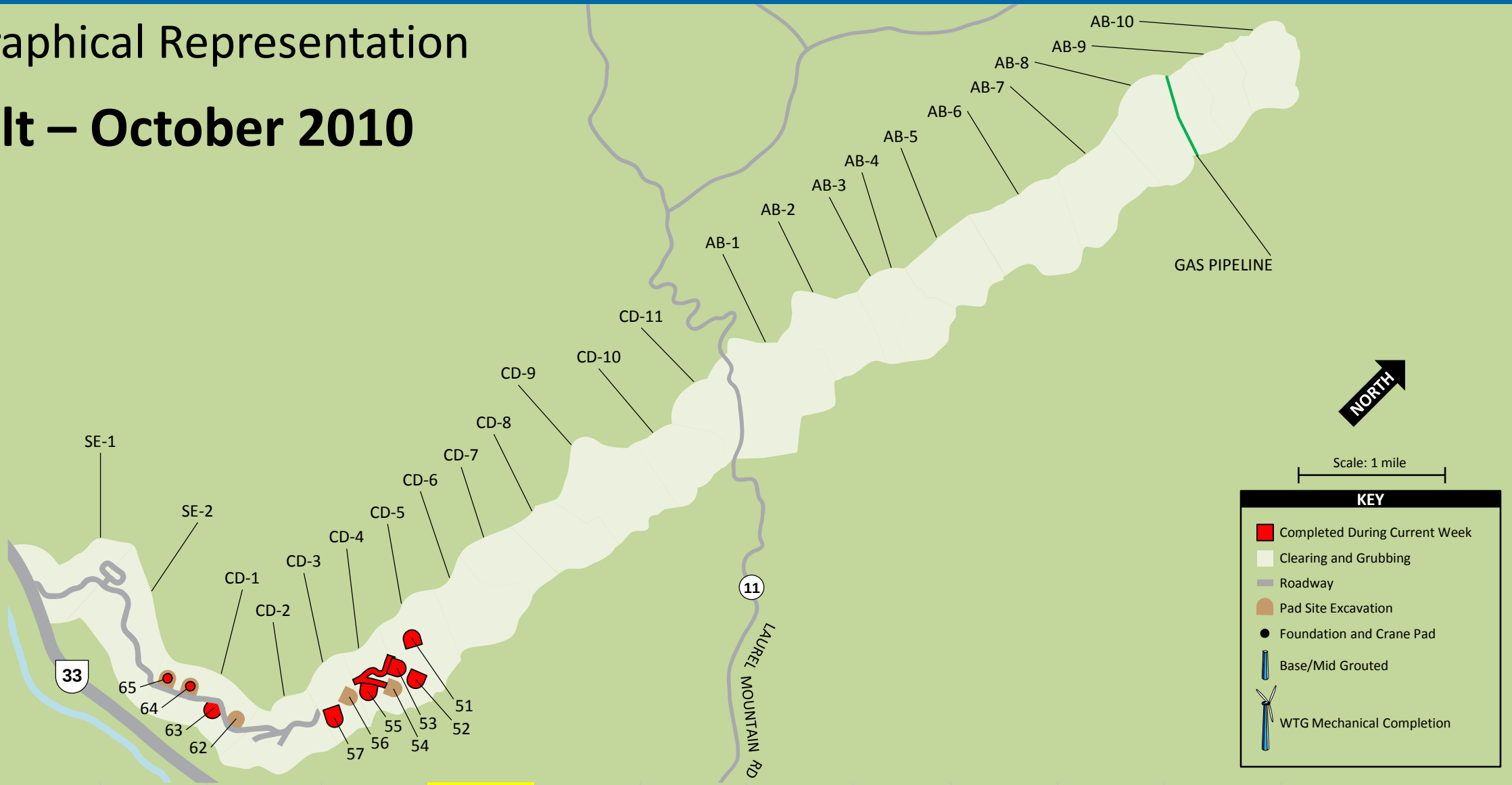
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – October 2010



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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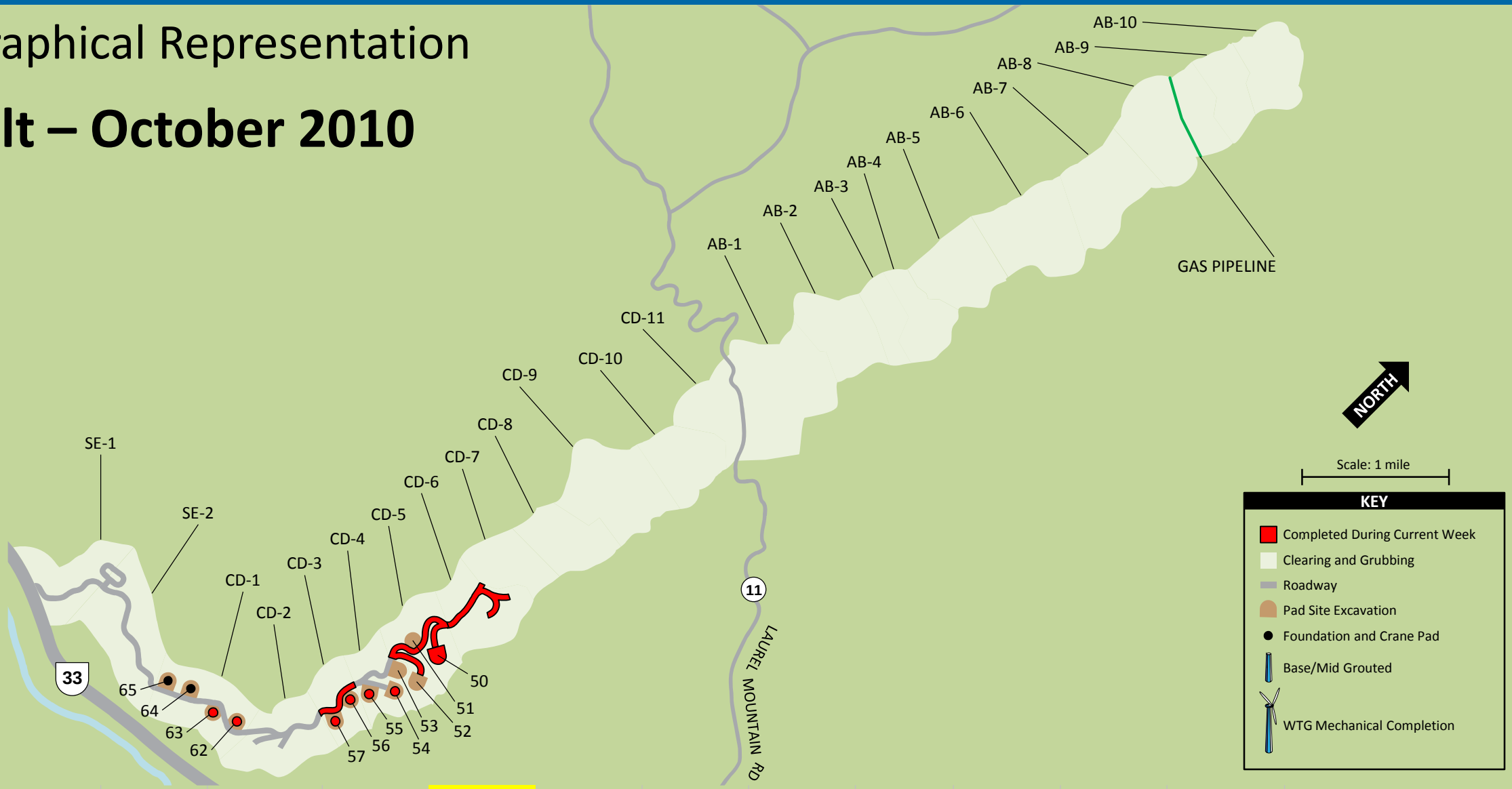
JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – October 2010



WEEKS

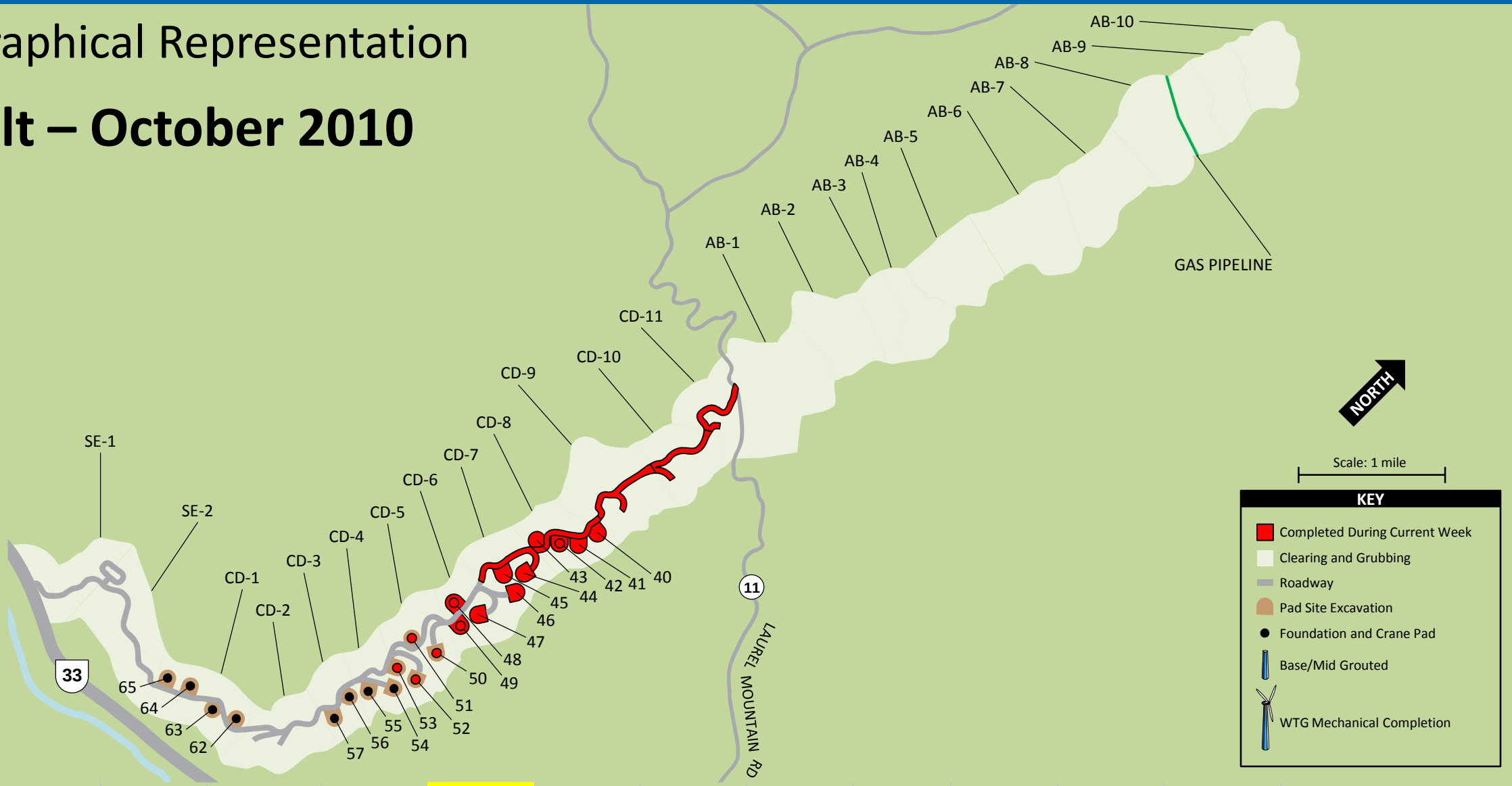
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – October 2010



WEEKS

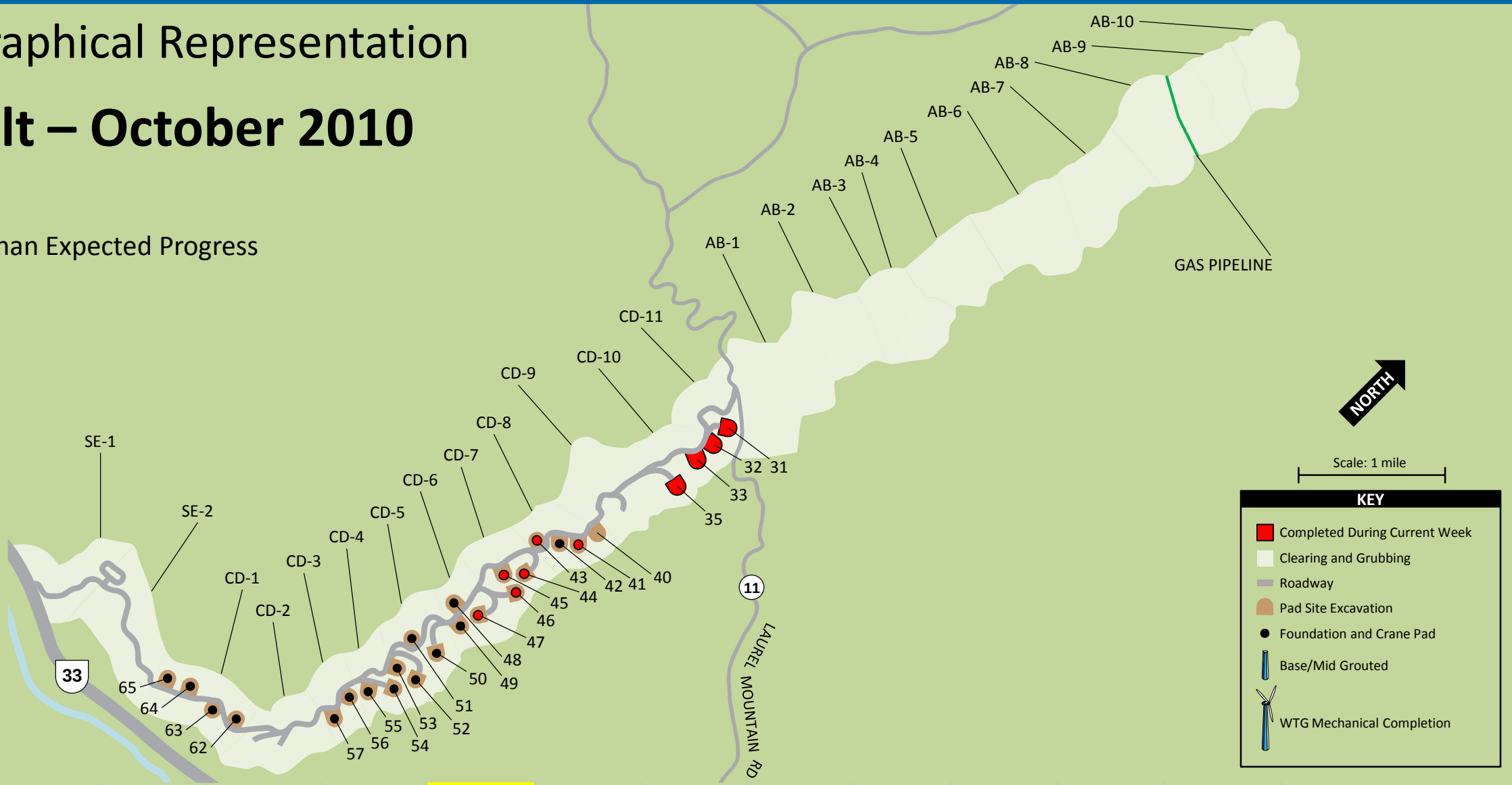
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011				FEB 2011				MAR 2011				APR 2011					MAY 2011					

III.A. Graphical Representation

As-Built – October 2010

- Site Issues
  - Better than Expected Progress



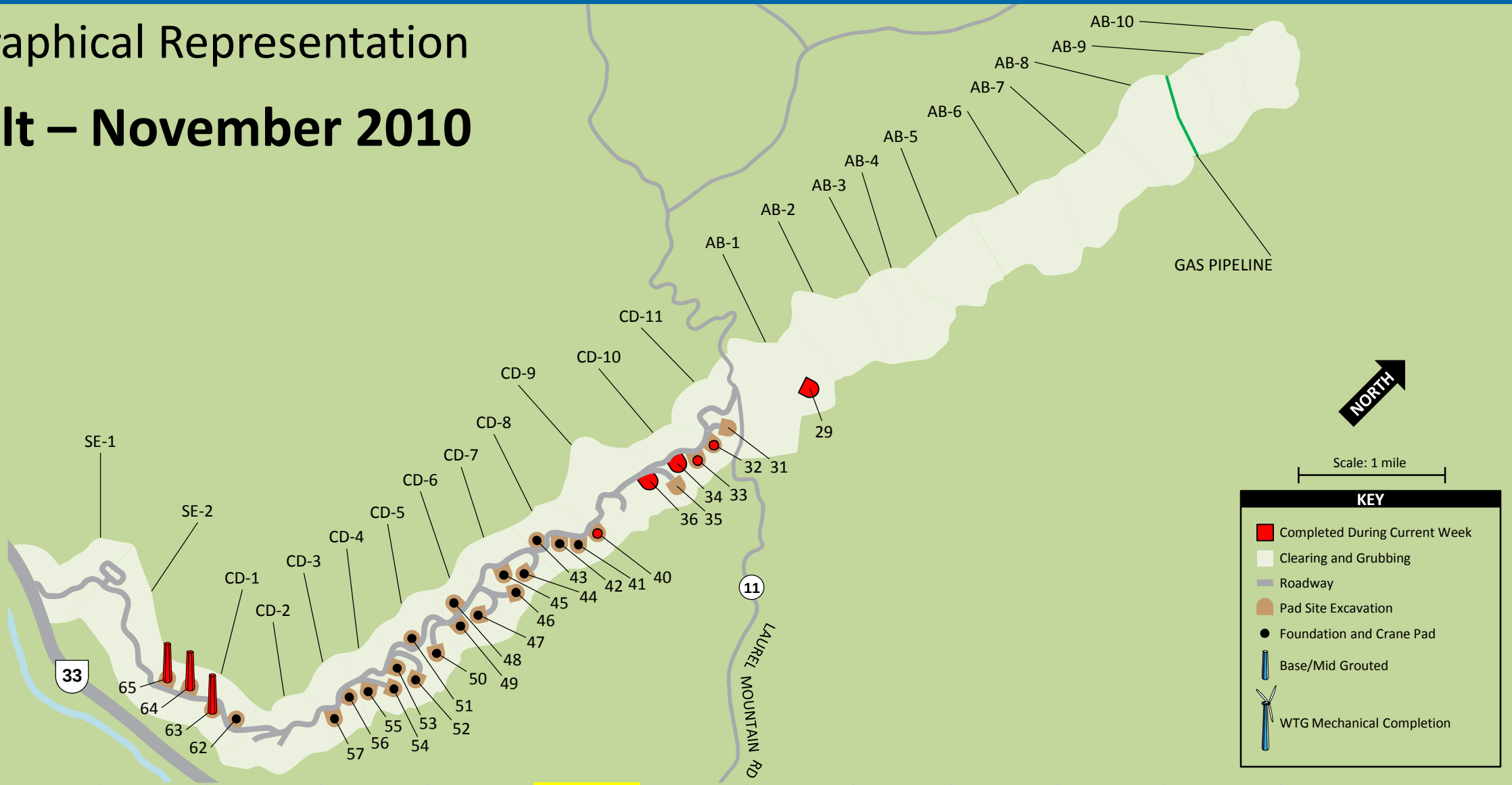
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011					MAR 2011					APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – November 2010



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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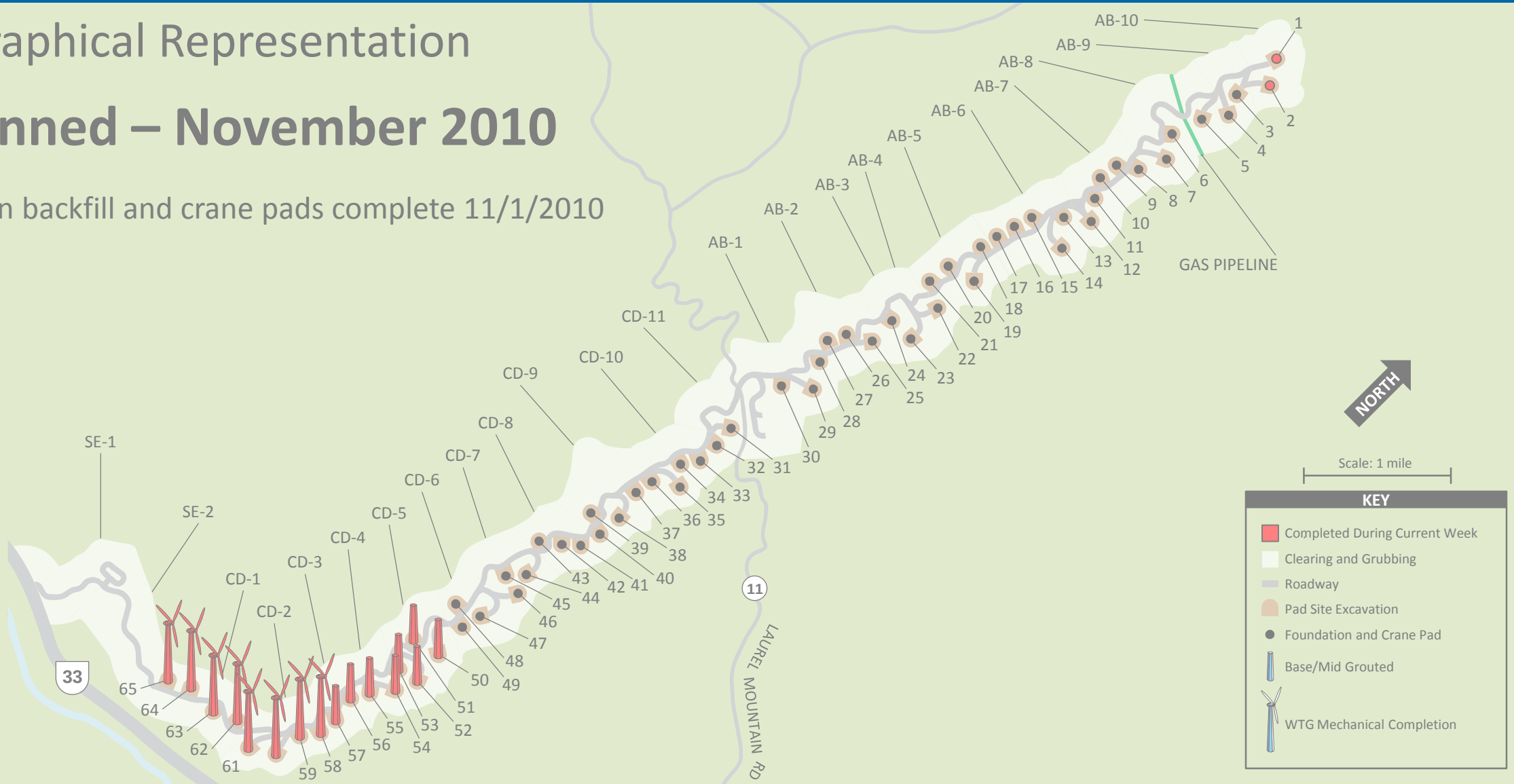
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011					MAR 2011					APR 2011					MAY 2011				

III.A. Graphical Representation

As-Planned – November 2010

- Foundation backfill and crane pads complete 11/1/2010



WEEKS

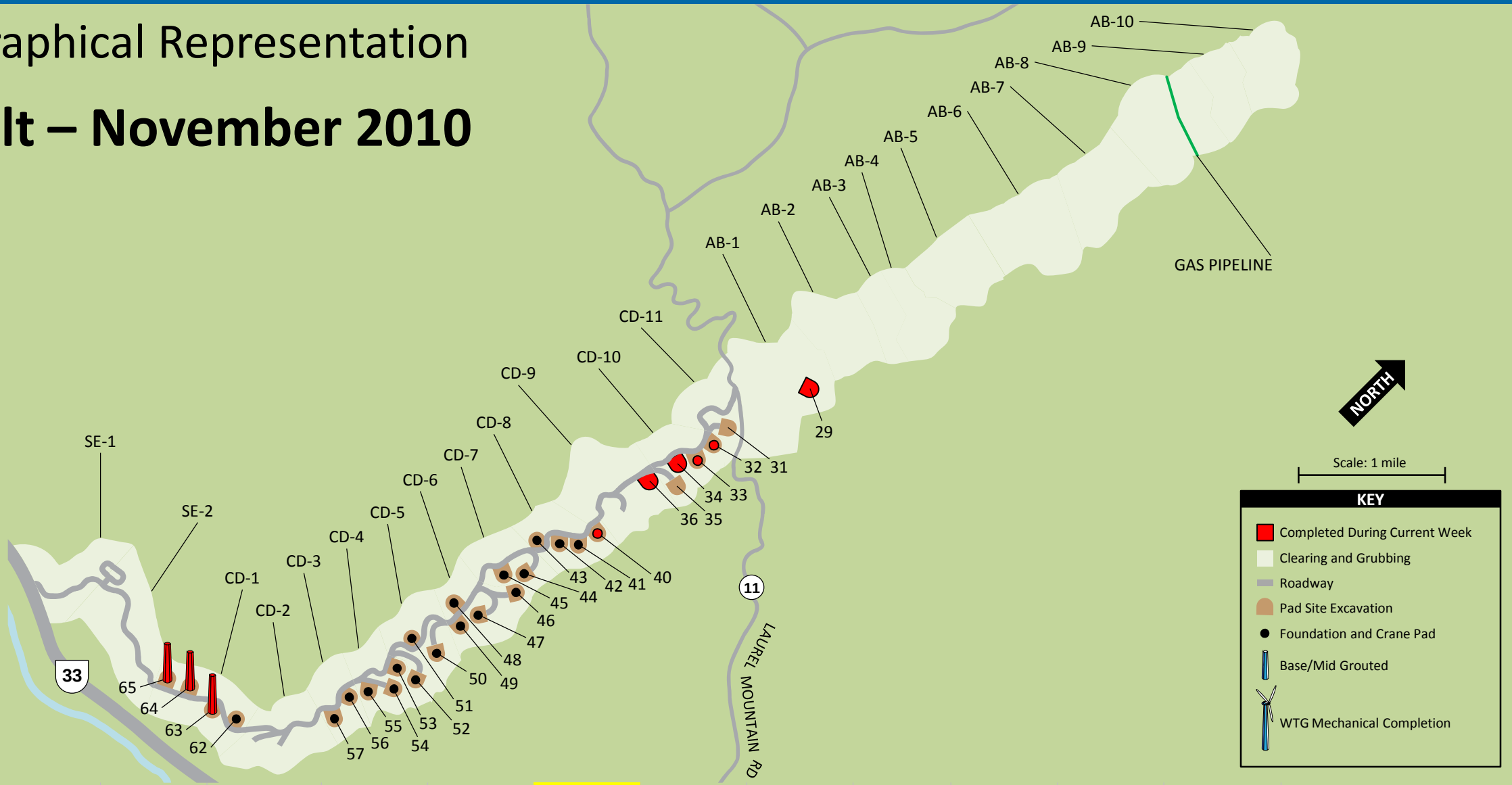
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – November 2010



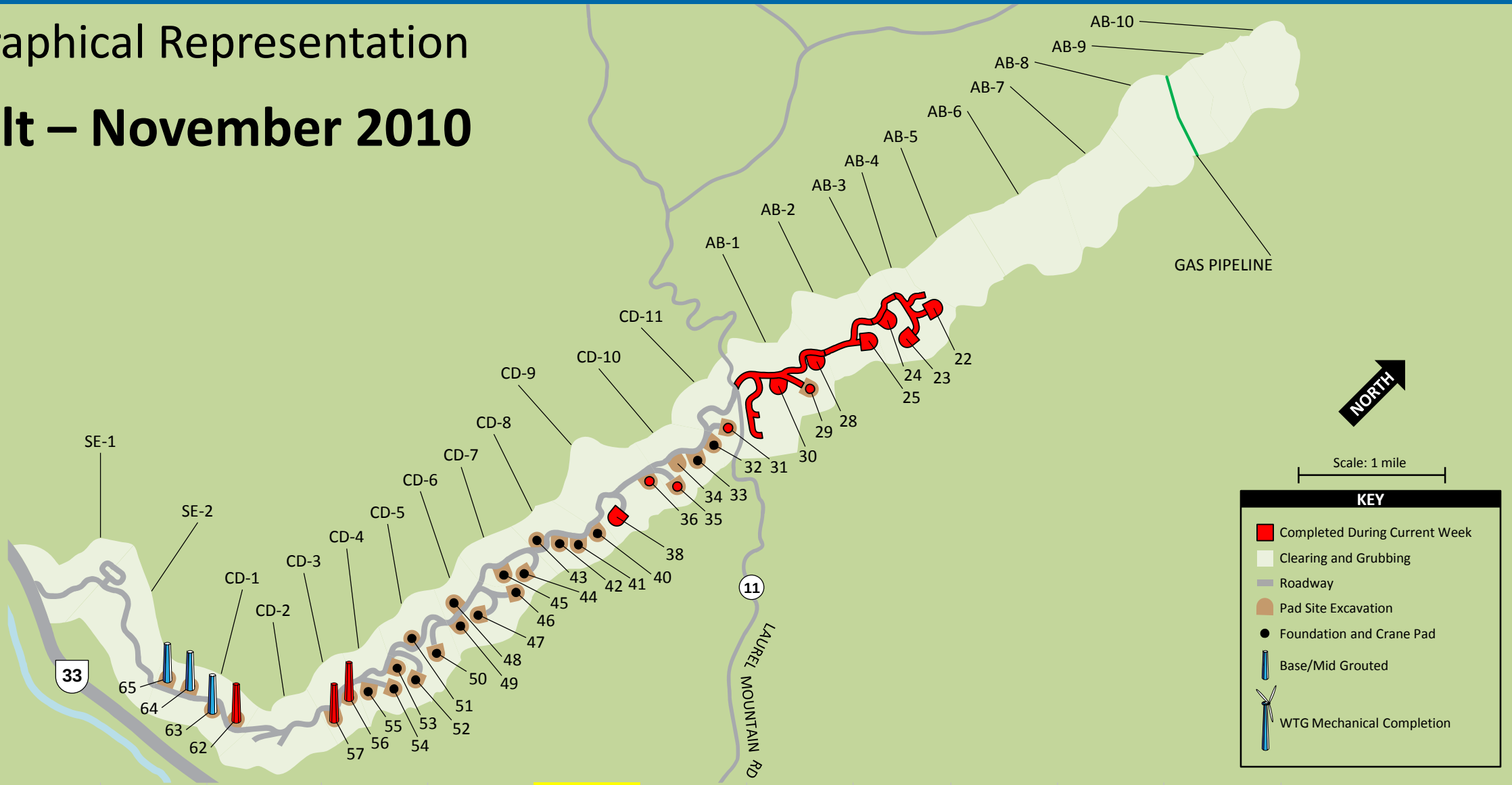
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011					MAR 2011					APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – November 2010



WEEKS

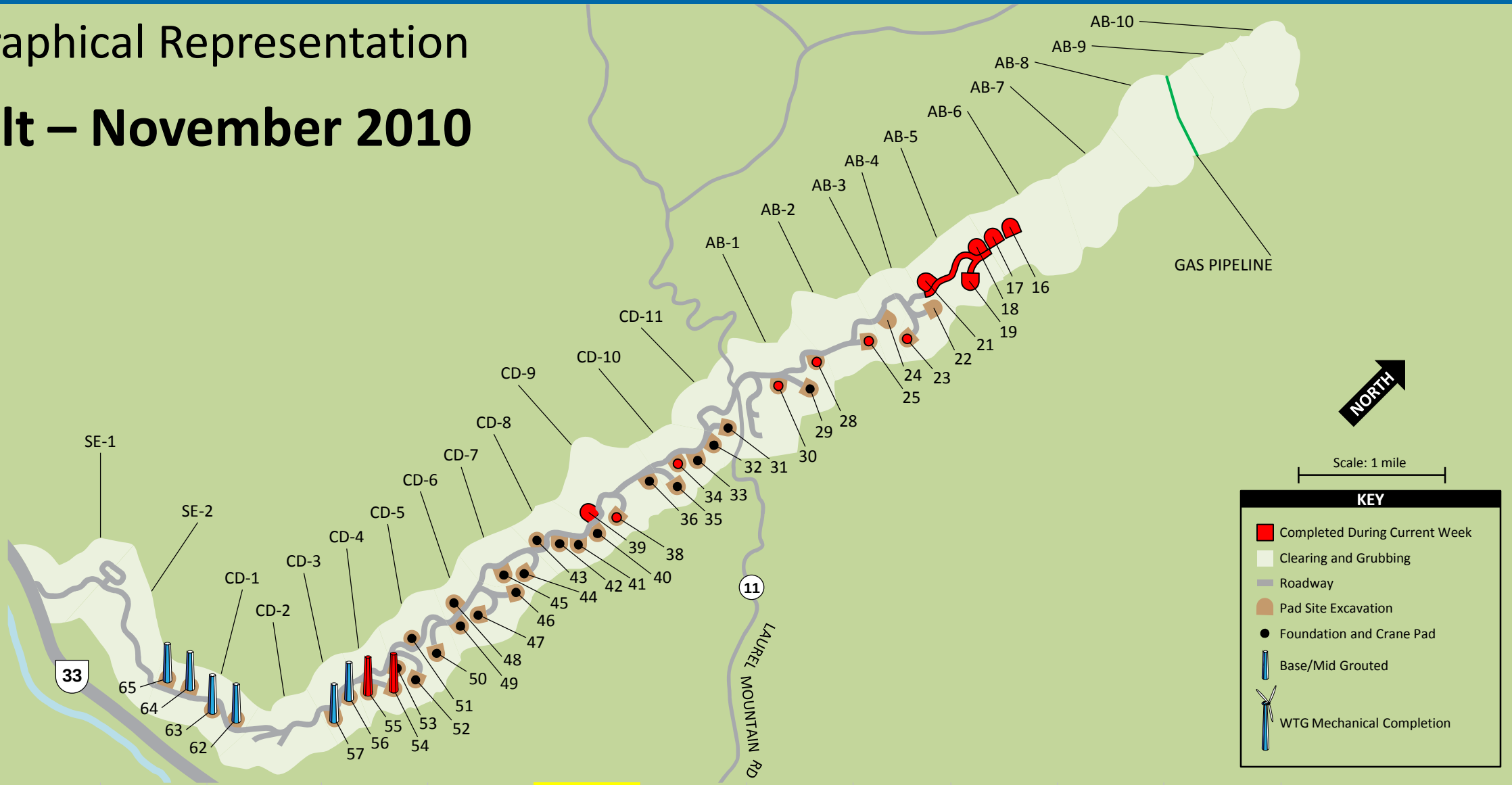
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – November 2010



WEEKS

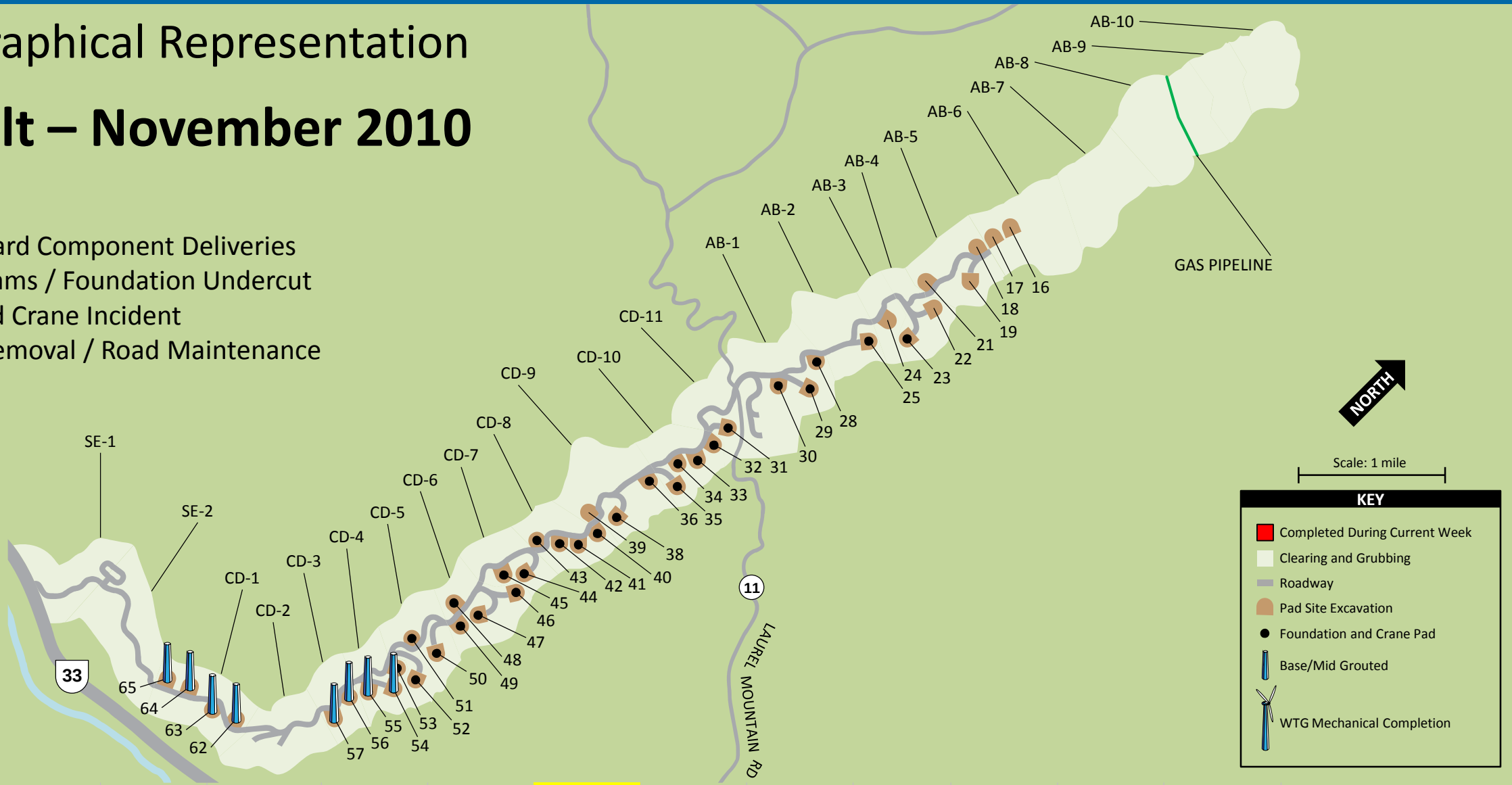
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011				FEB 2011				MAR 2011					APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – November 2010

- Site Issues
  - Haphazard Component Deliveries
  - Coal Seams / Foundation Undercut
  - KR Wind Crane Incident
  - Snow Removal / Road Maintenance



WEEKS

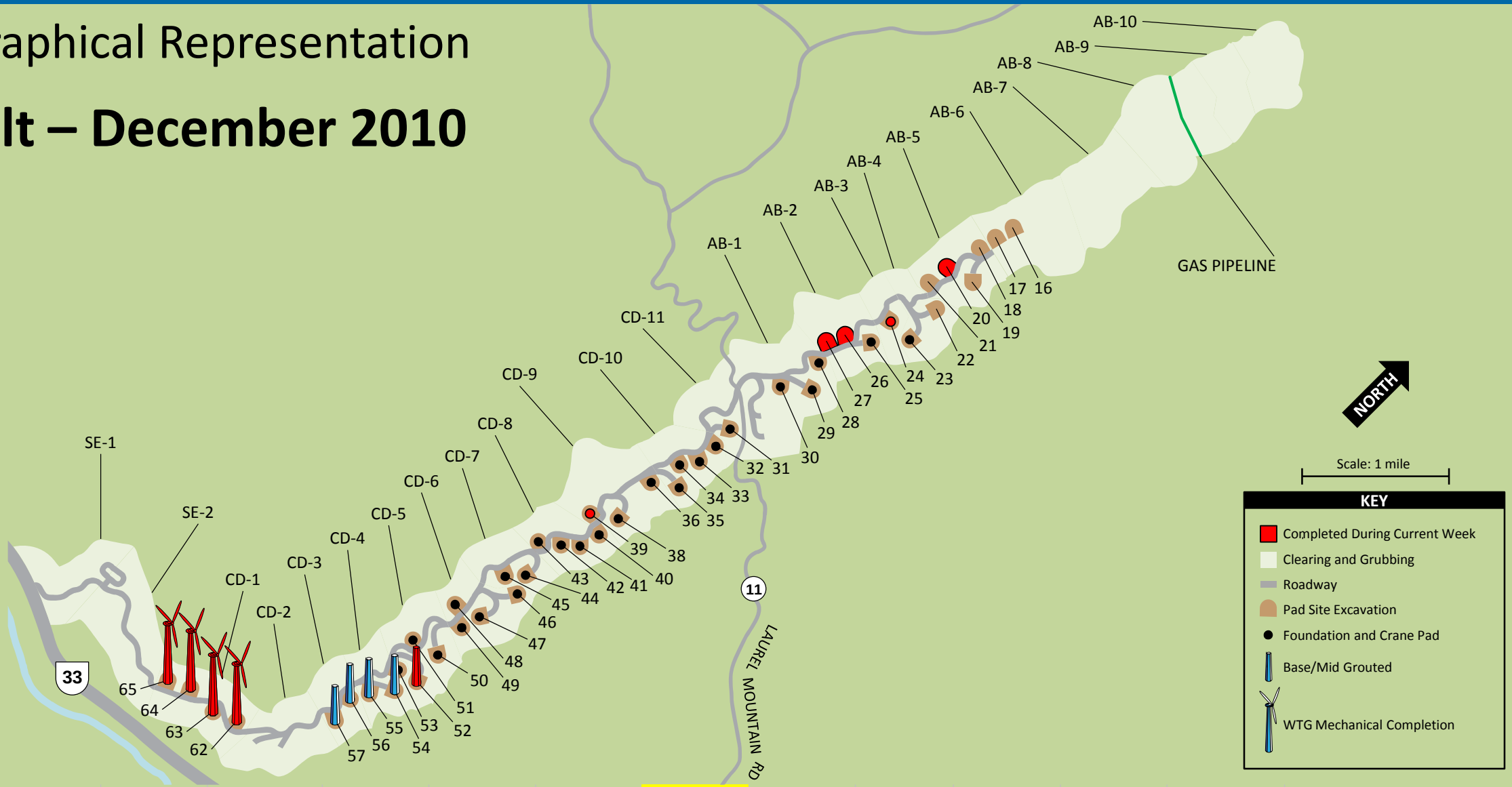
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – December 2010



WEEKS

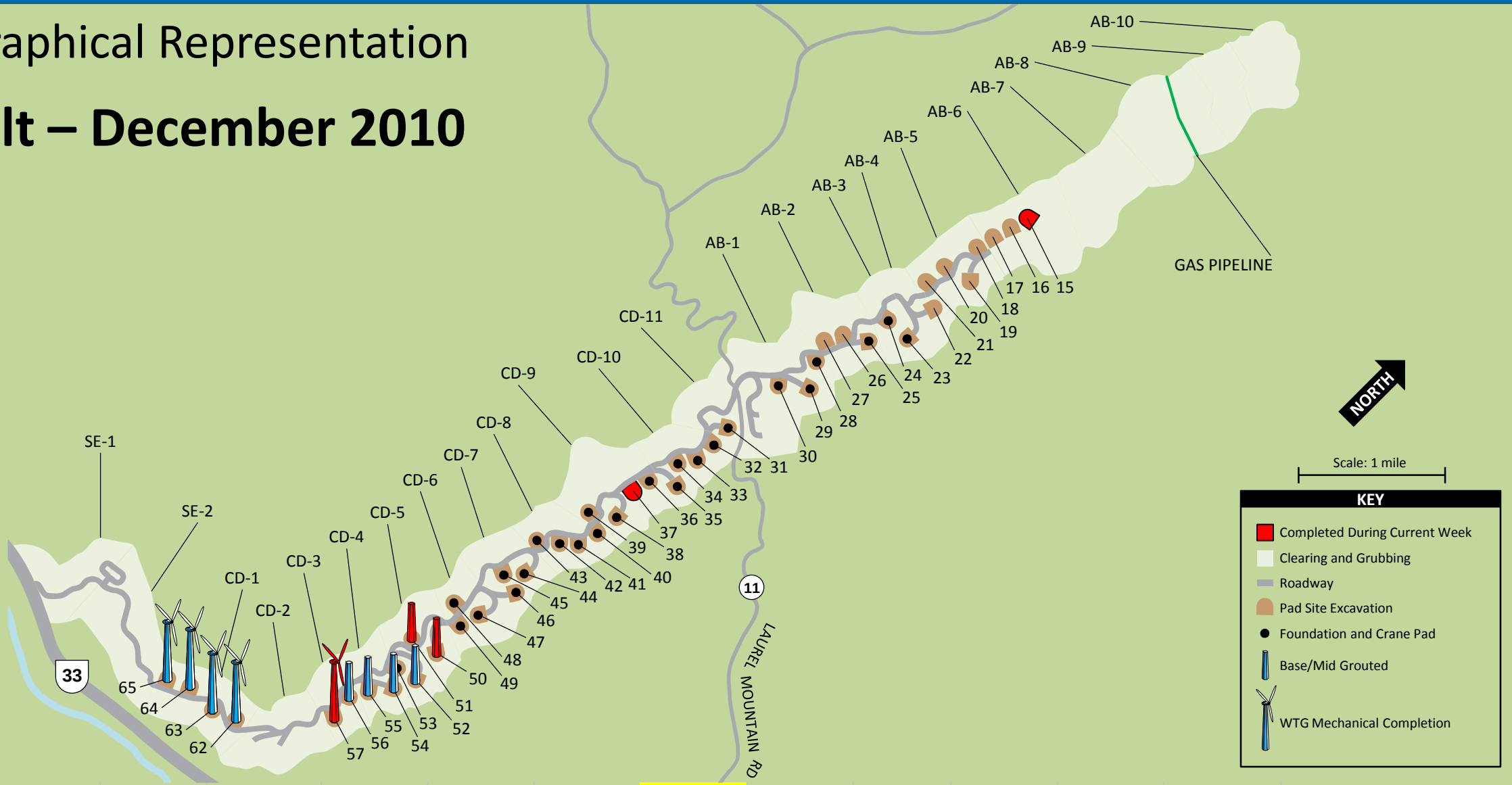
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – December 2010



WEEKS

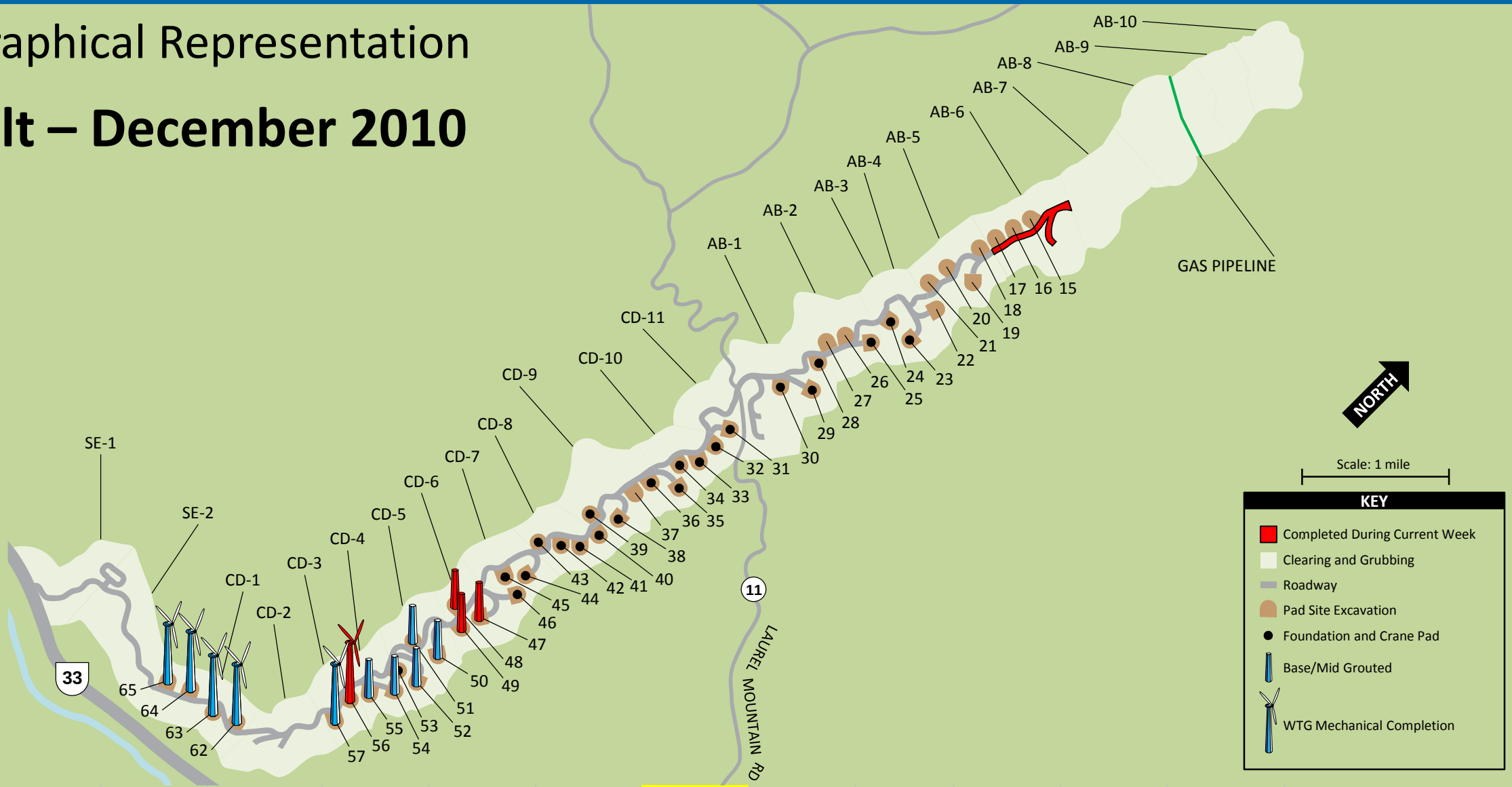
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – December 2010



WEEKS

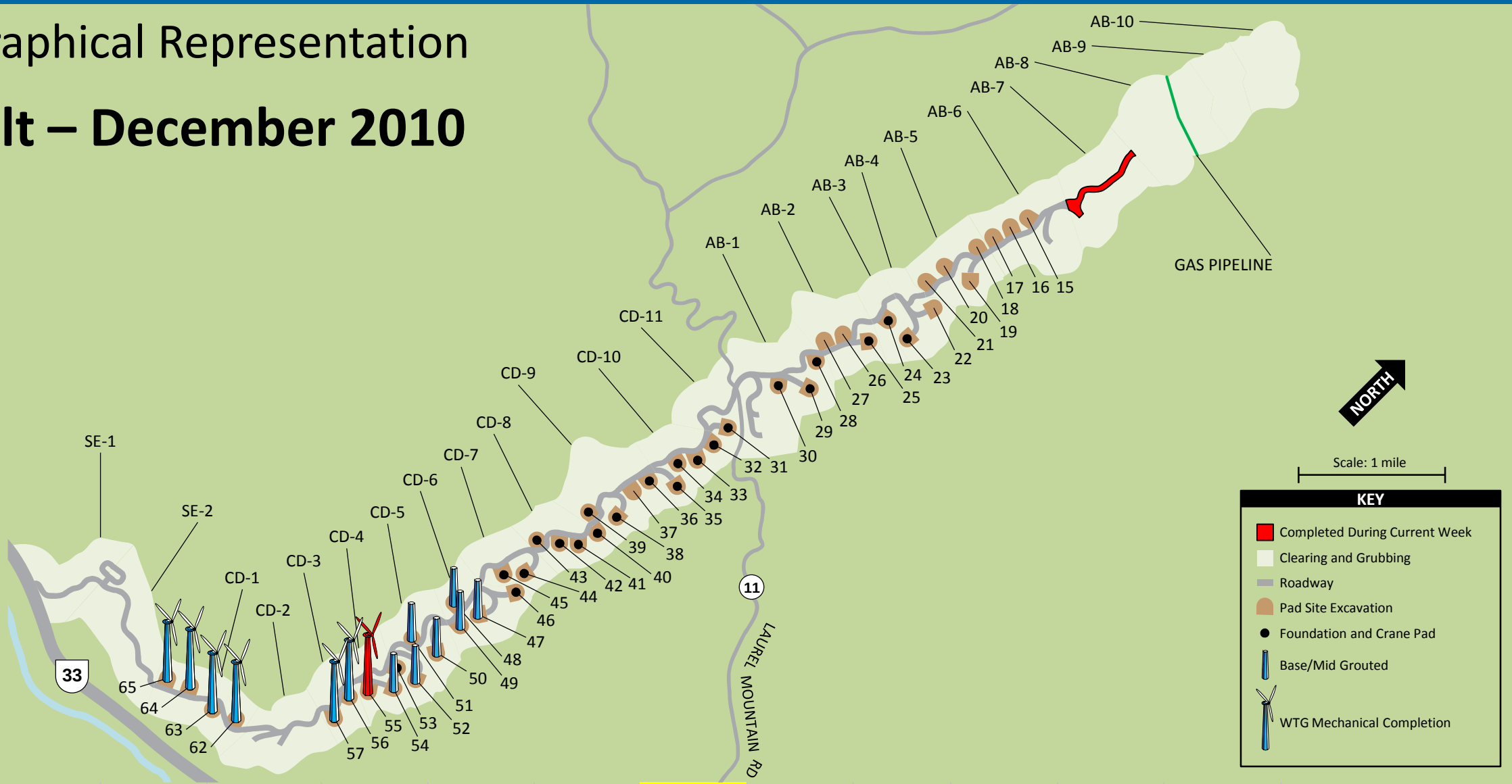
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – December 2010



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

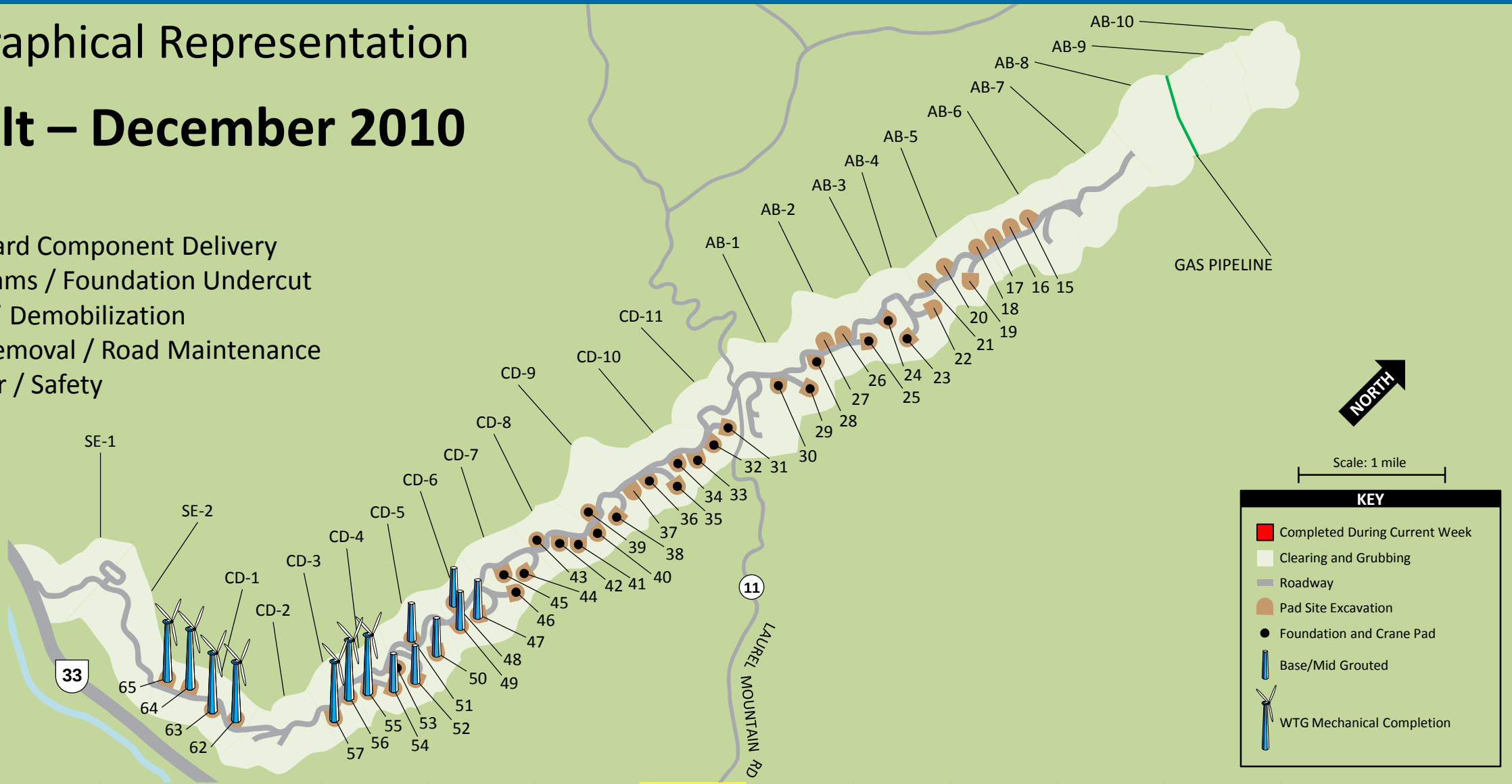
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

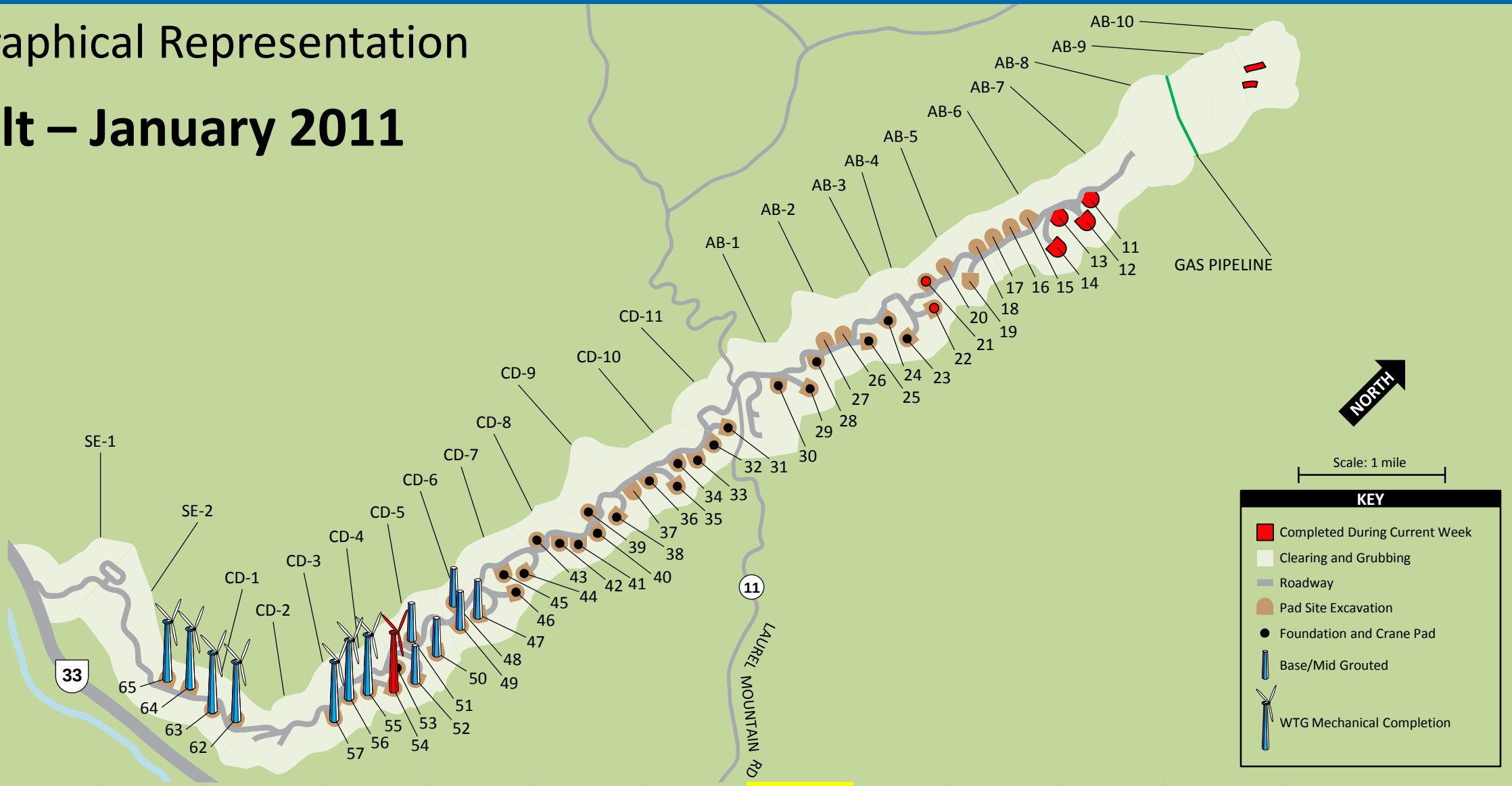
As-Built – December 2010

- Site Issues
  - Haphazard Component Delivery
  - Coal Seams / Foundation Undercut
  - Stevens' Demobilization
  - Snow Removal / Road Maintenance
  - Weather / Safety



III.A. Graphical Representation

As-Built – January 2011



WEEKS

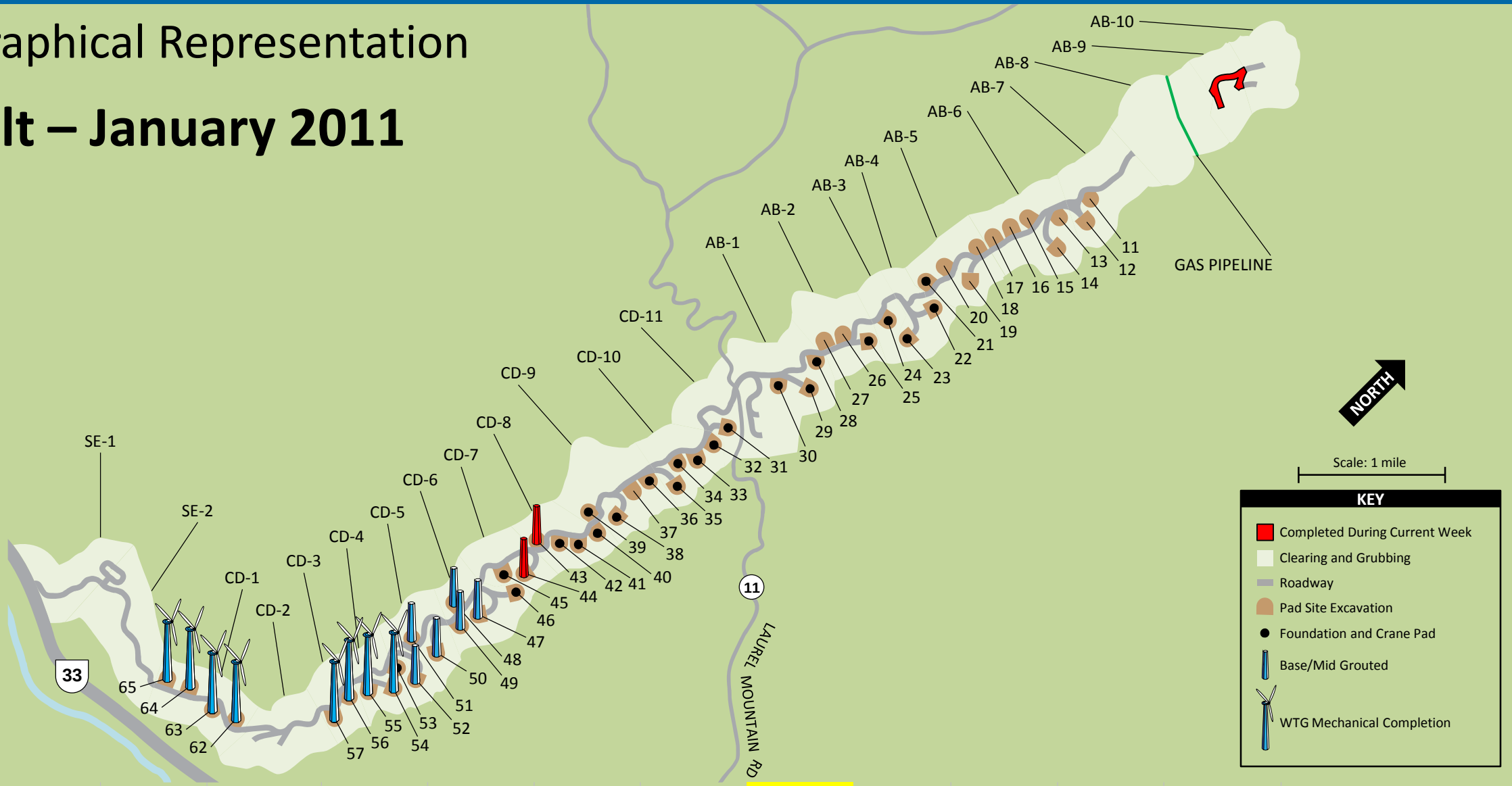
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – January 2011



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

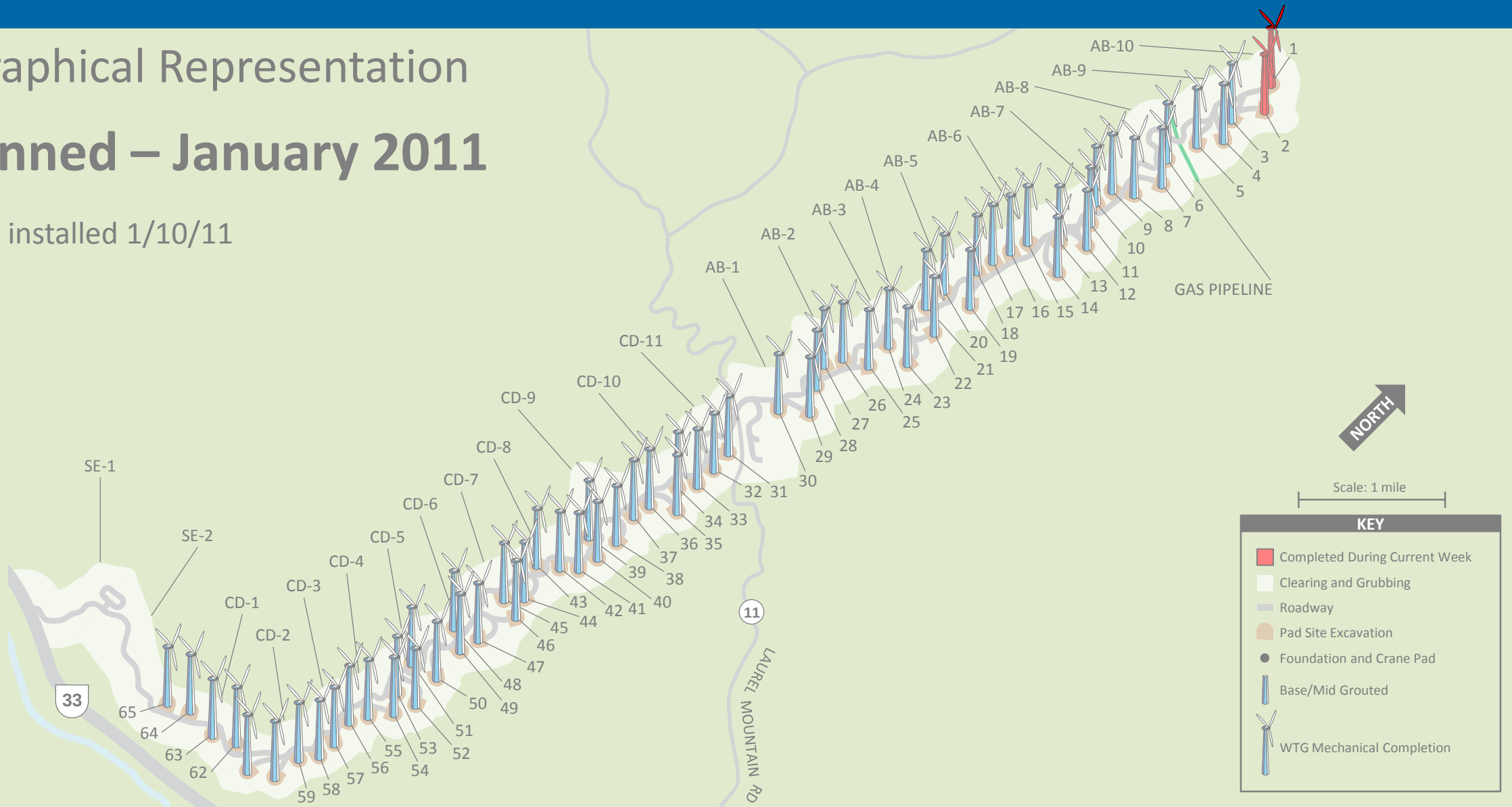
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Planned – January 2011

- Final rotor installed 1/10/11



WEEKS

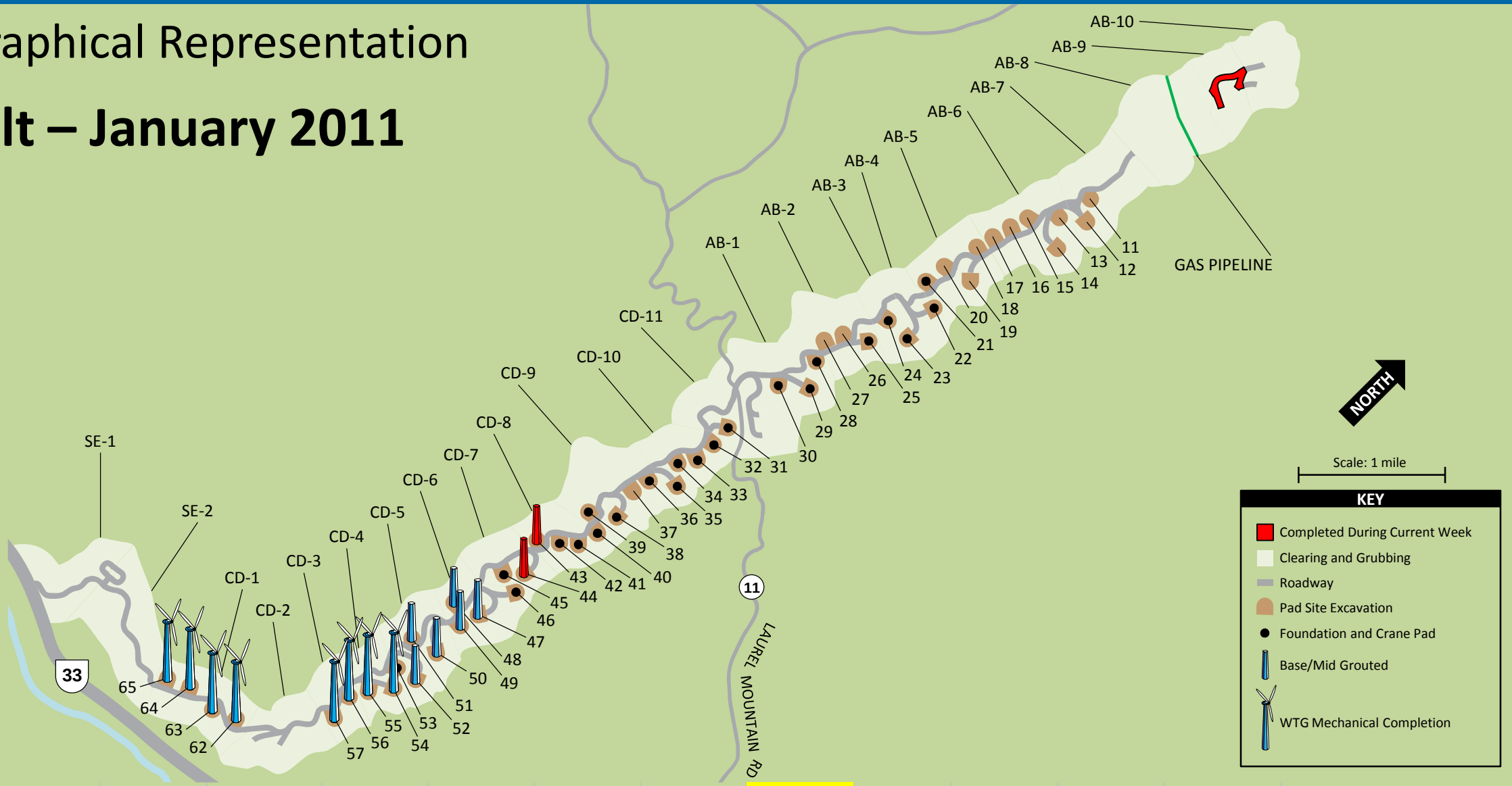
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – January 2011



WEEKS

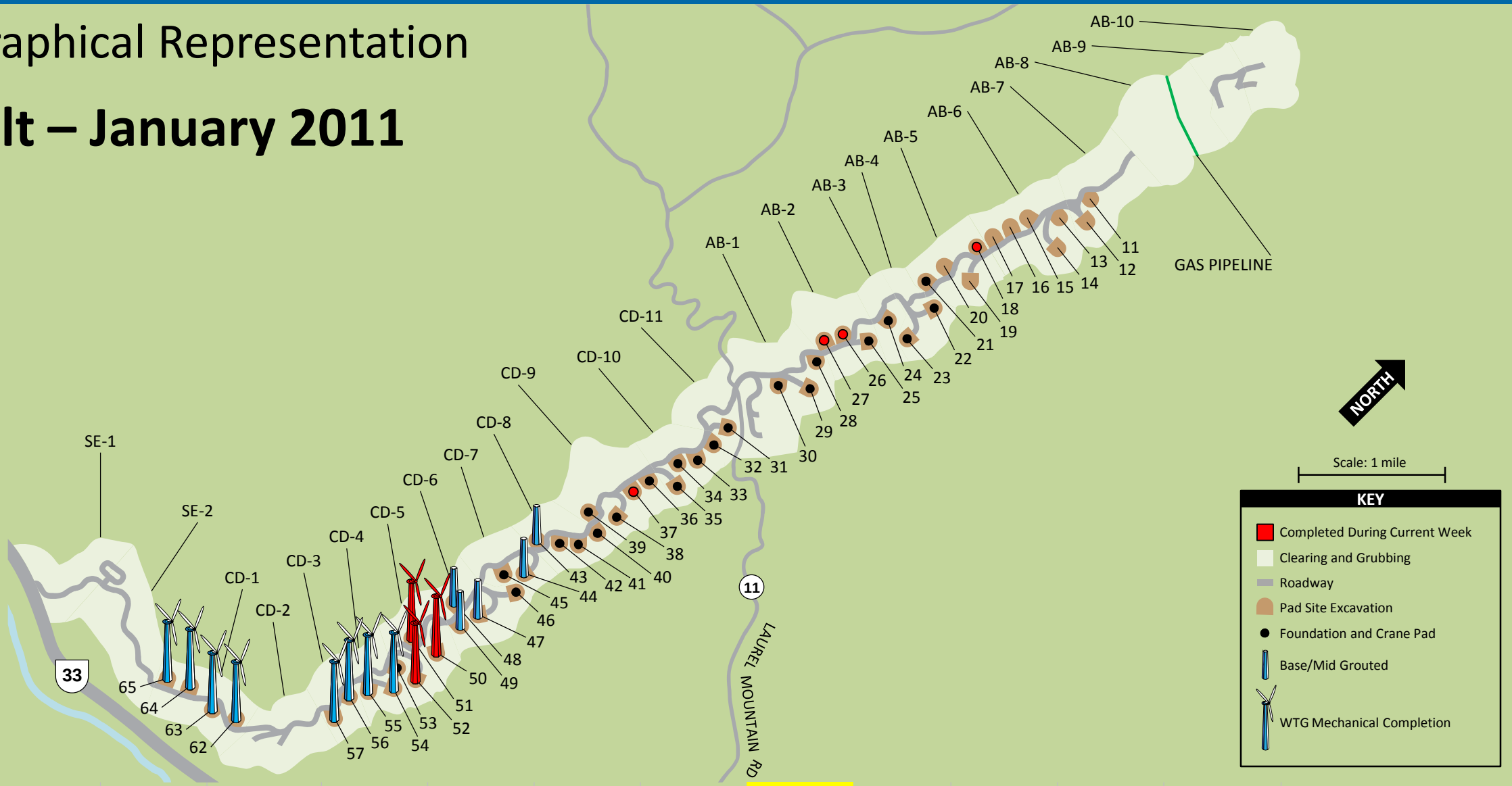
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – January 2011



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

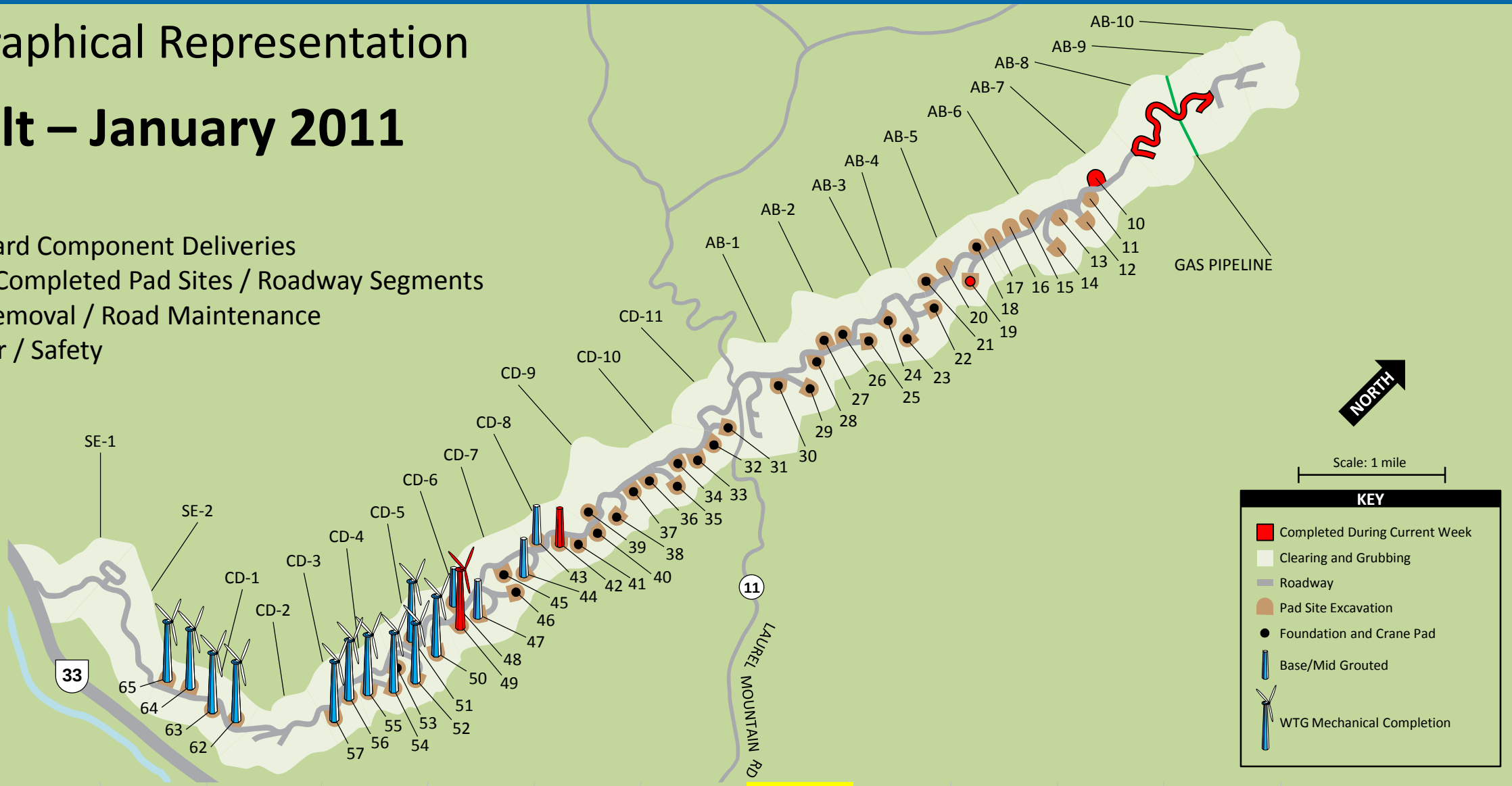
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – January 2011

- Site Issues
  - Haphazard Component Deliveries
  - Lack of Completed Pad Sites / Roadway Segments
  - Snow Removal / Road Maintenance
  - Weather / Safety



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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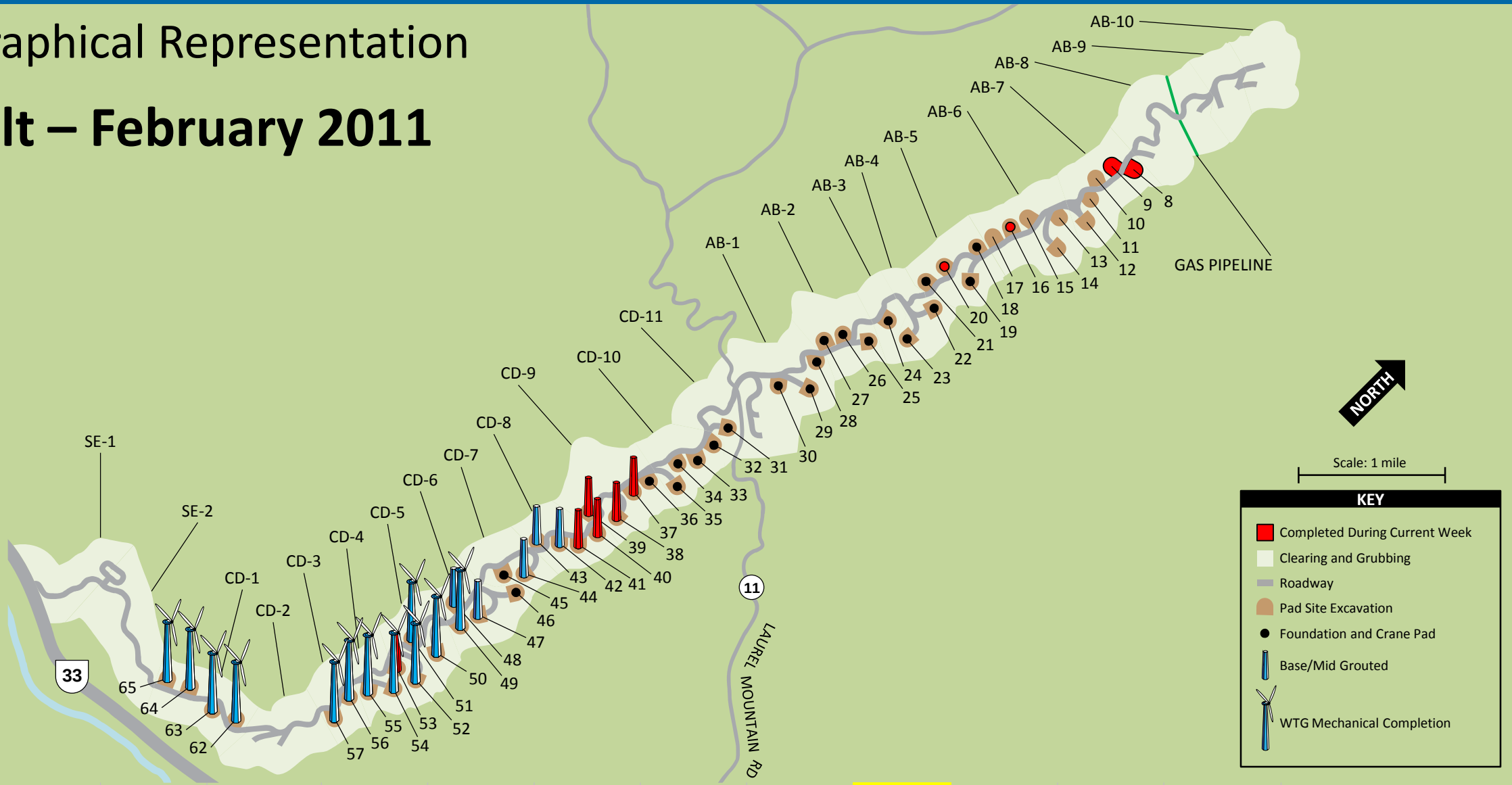
JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – February 2011



WEEKS

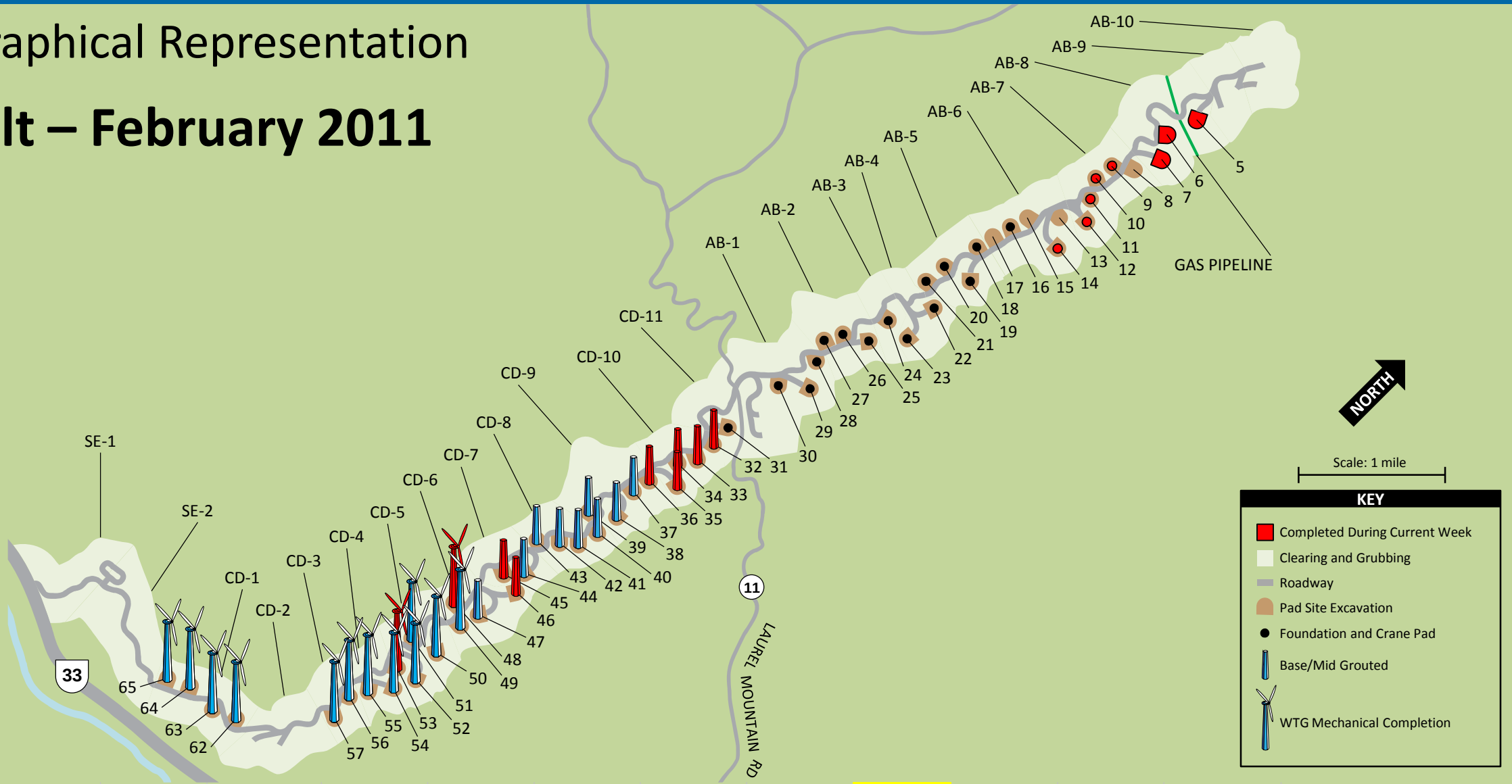
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – February 2011



WEEKS

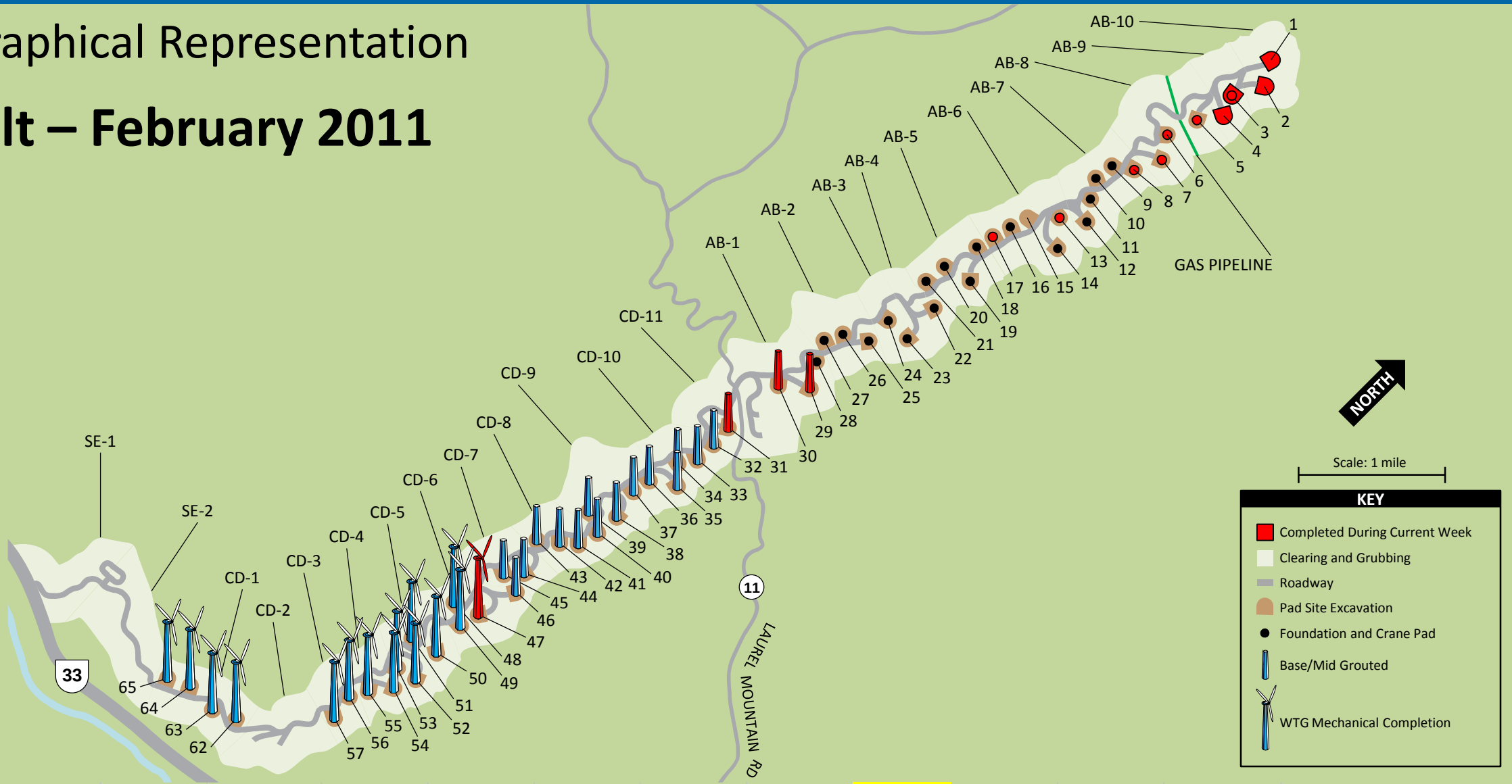
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – February 2011



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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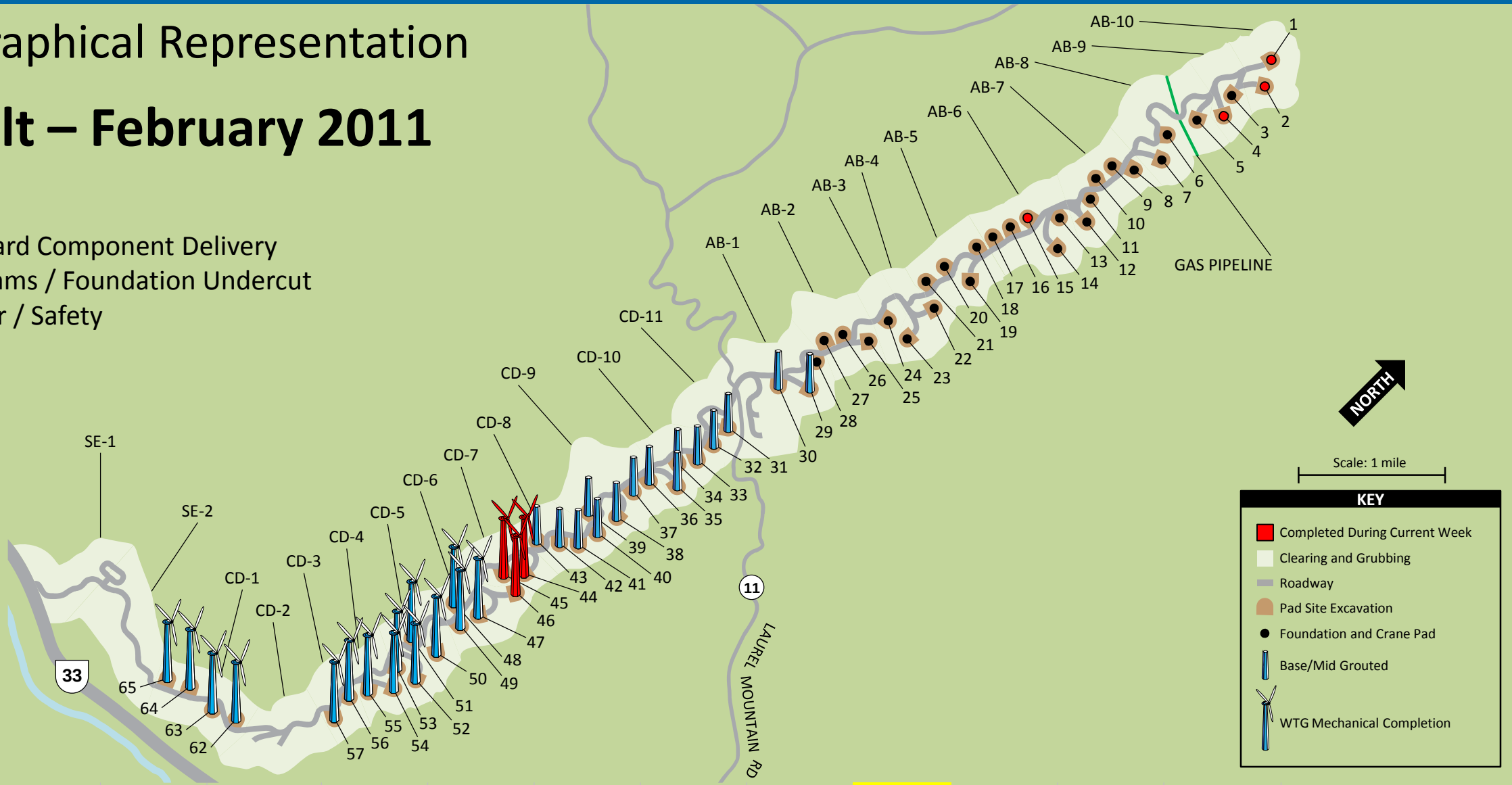
JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – February 2011

- Site Issues
  - Haphazard Component Delivery
  - Coal Seams / Foundation Undercut
  - Weather / Safety



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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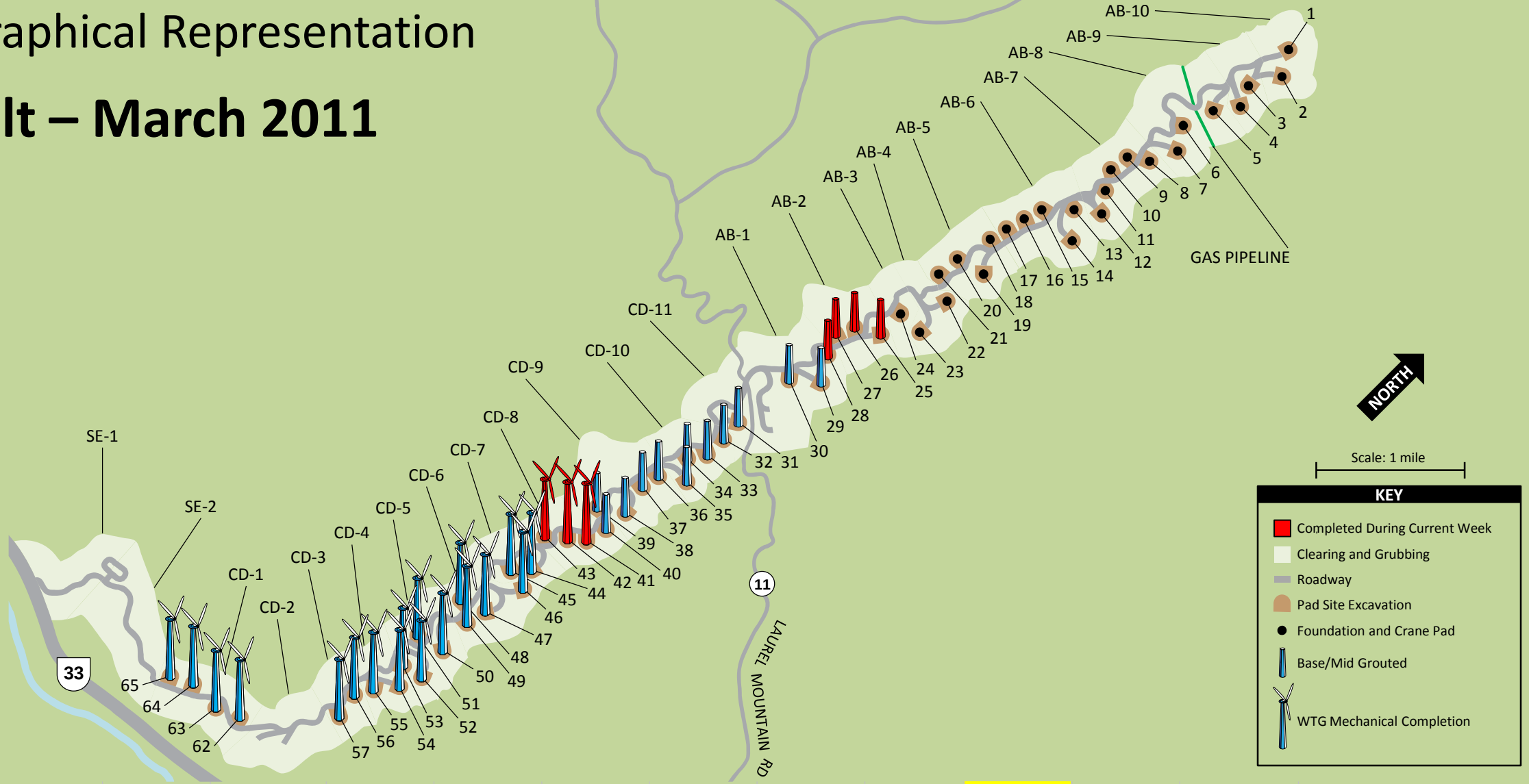
JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – March 2011



WEEKS

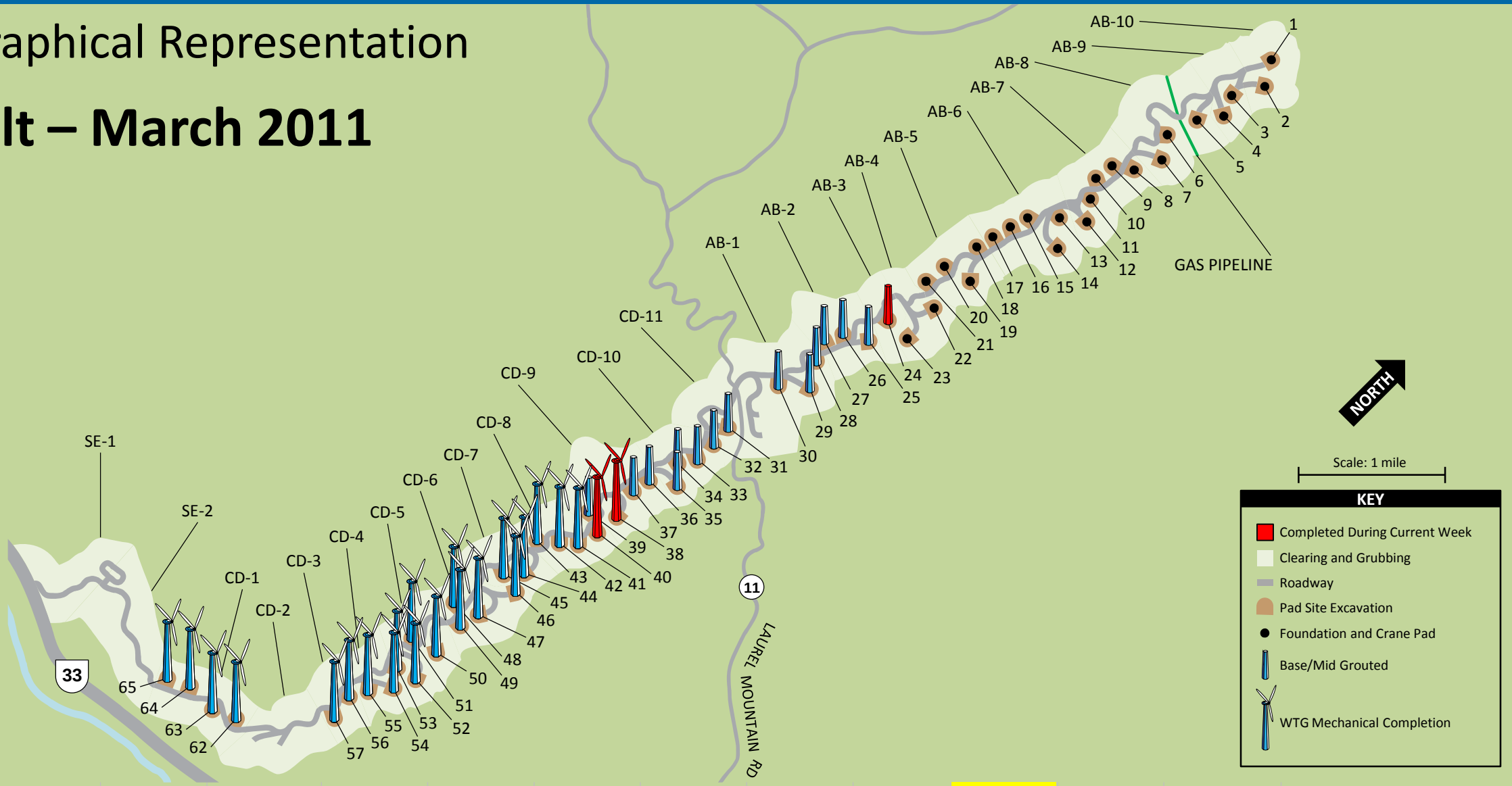
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – March 2011



WEEKS

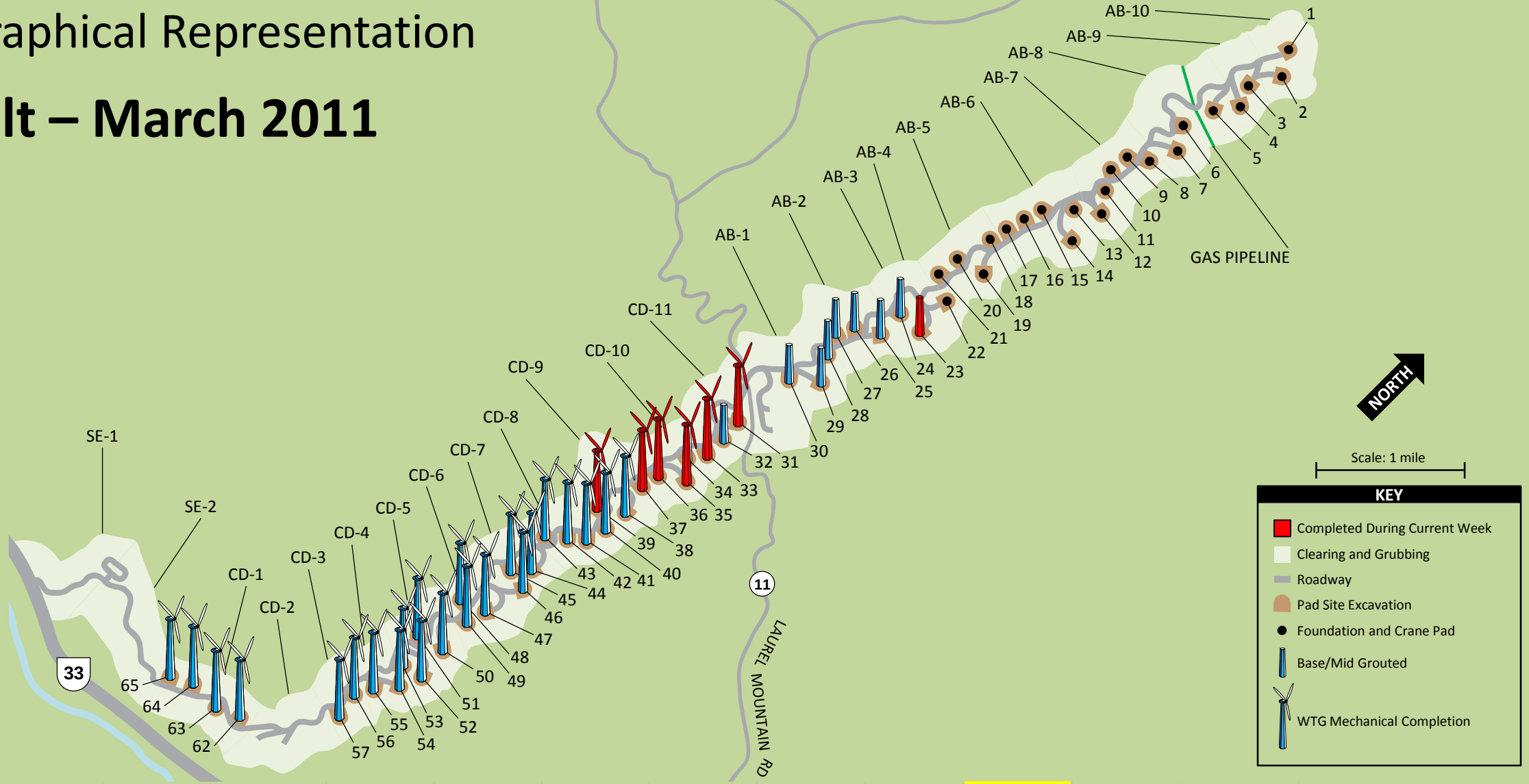
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – March 2011



WEEKS

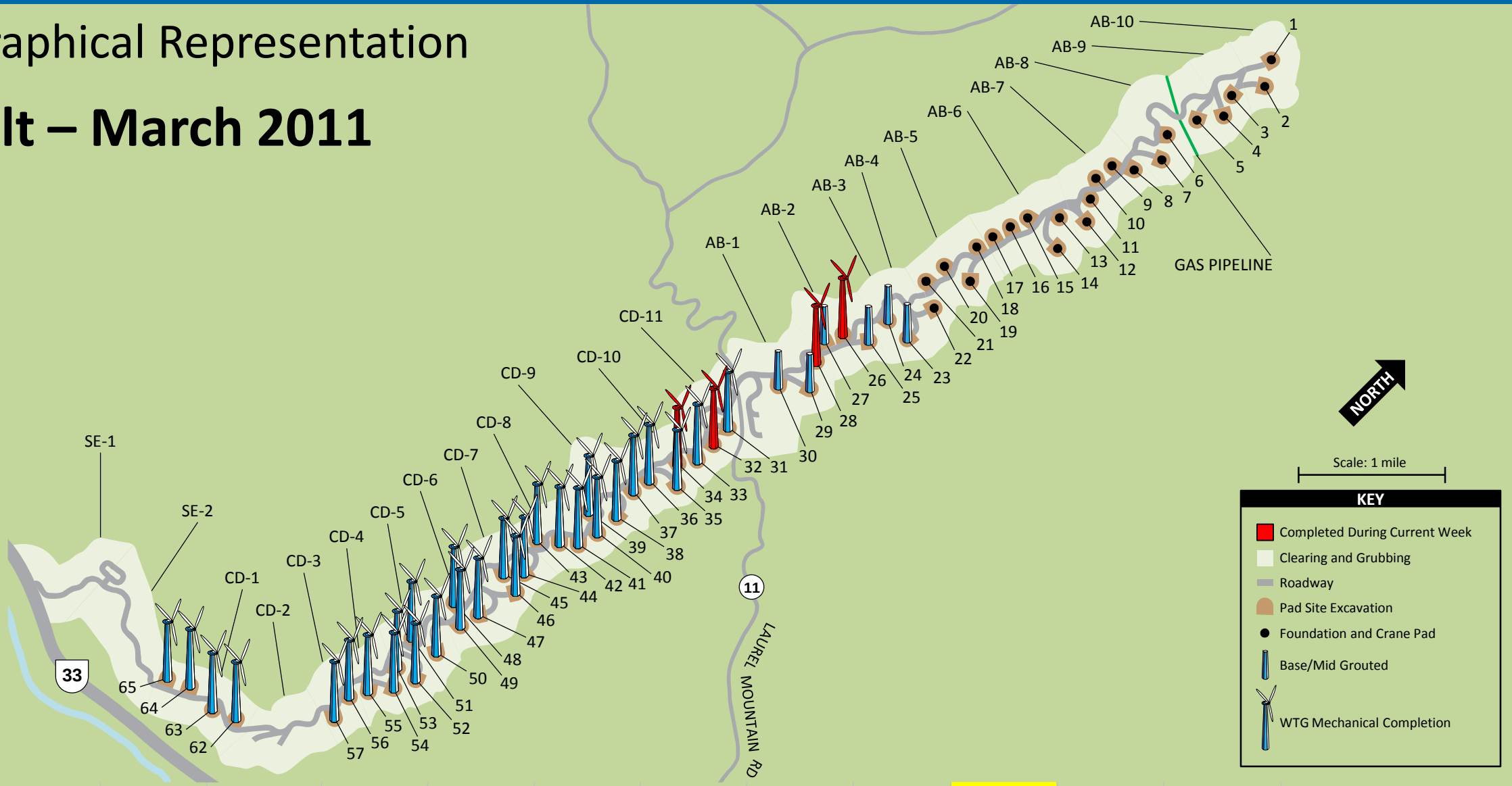
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – March 2011



WEEKS

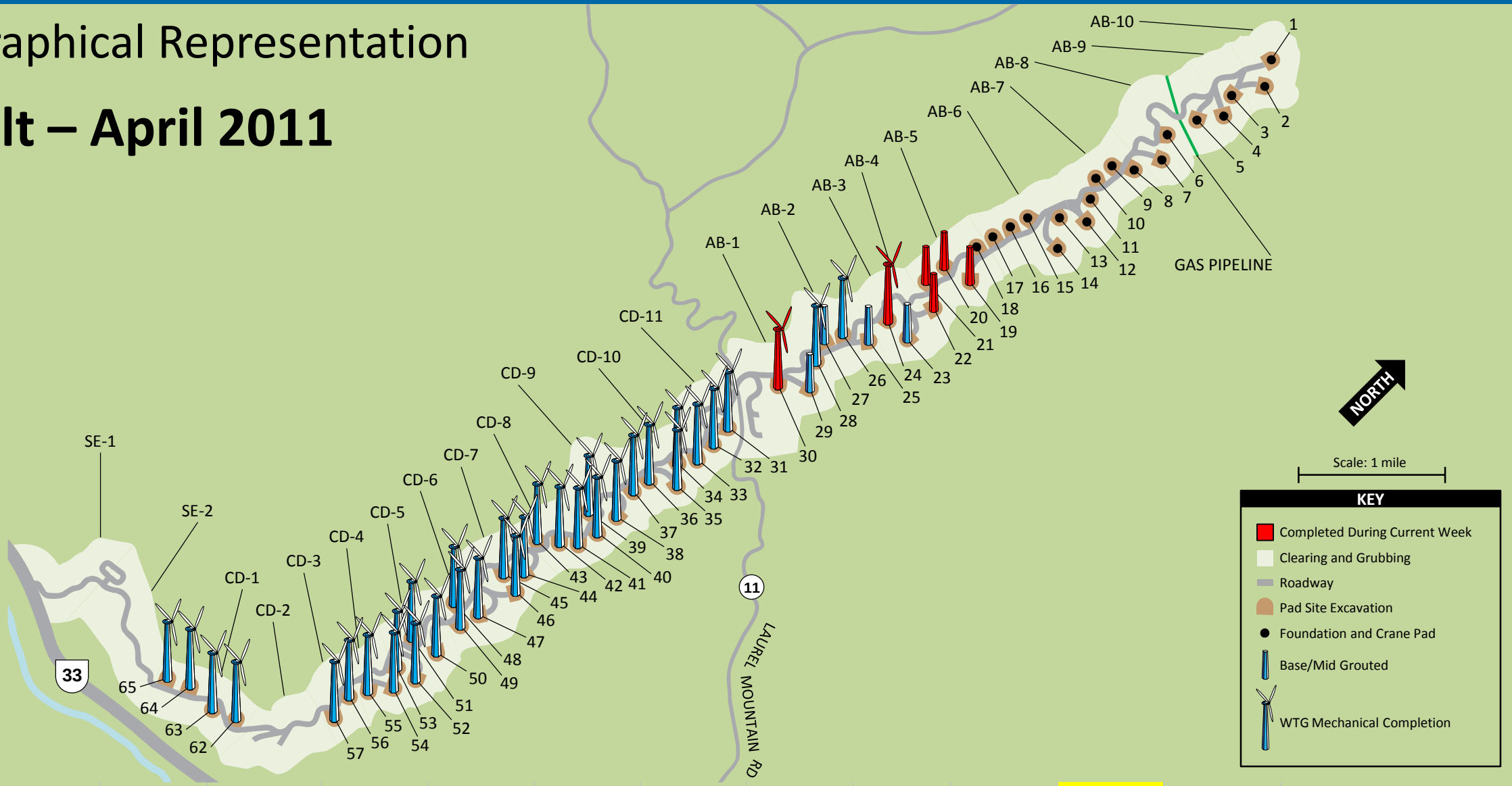
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – April 2011



WEEKS

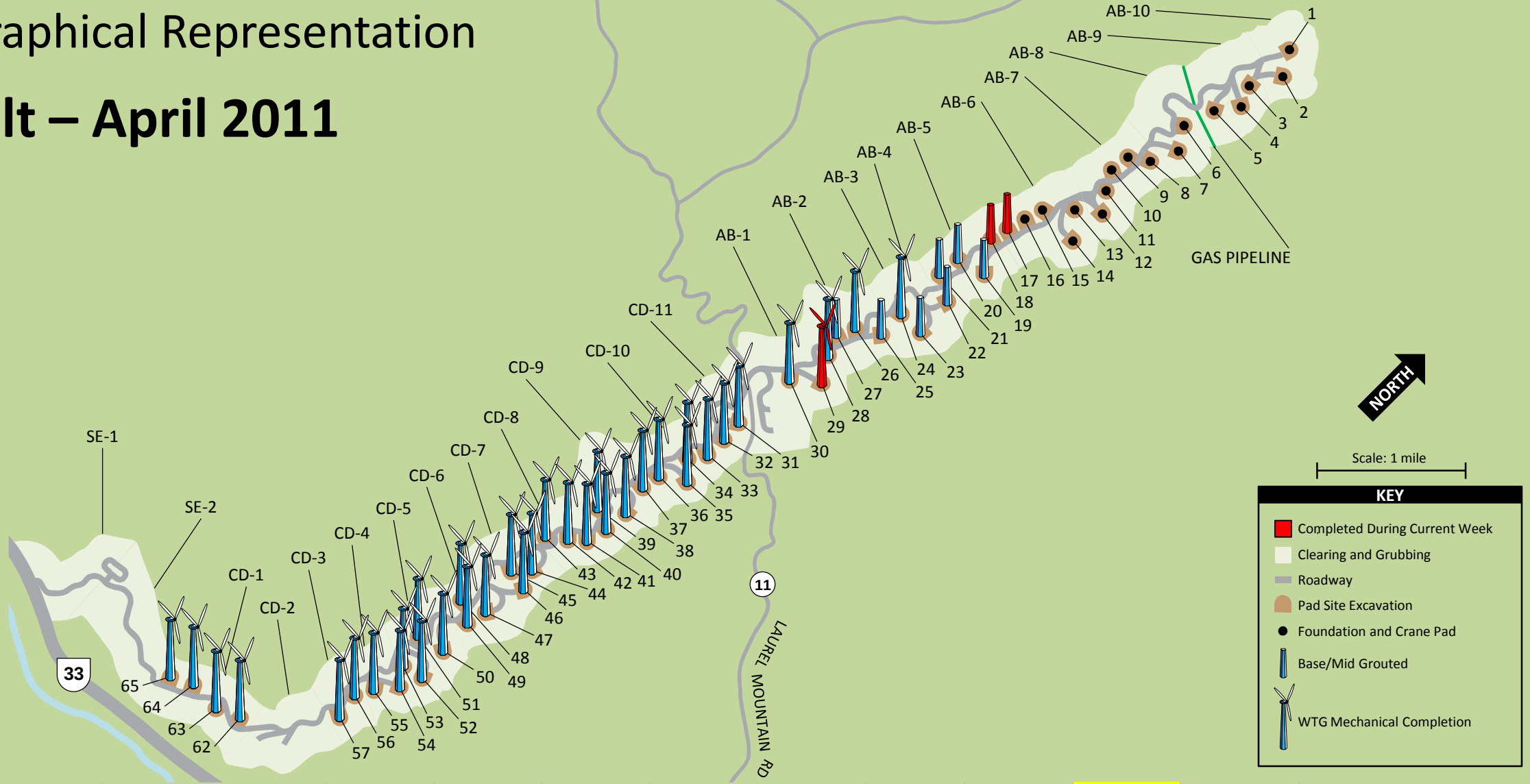
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – April 2011



WEEKS

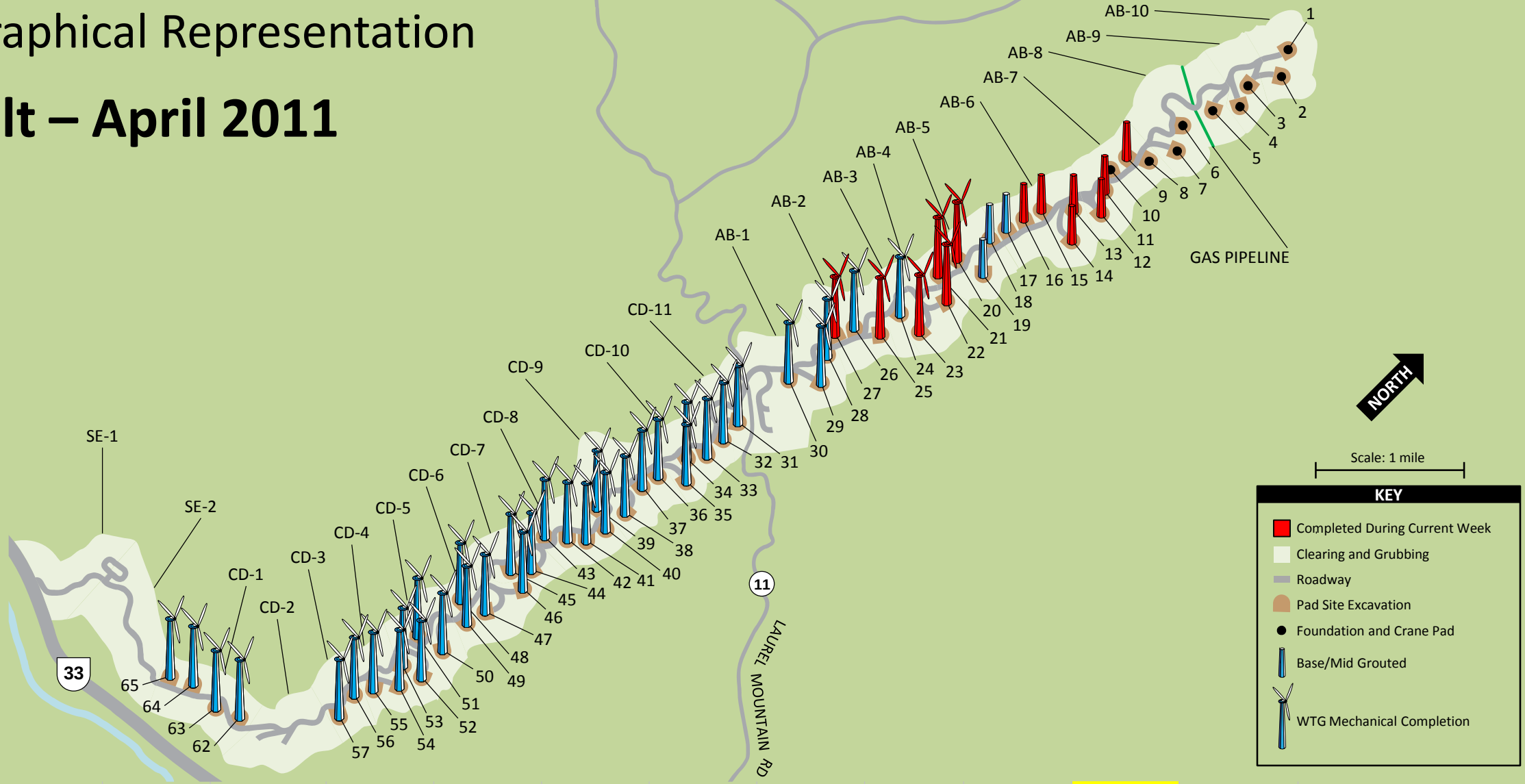
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – April 2011



WEEKS

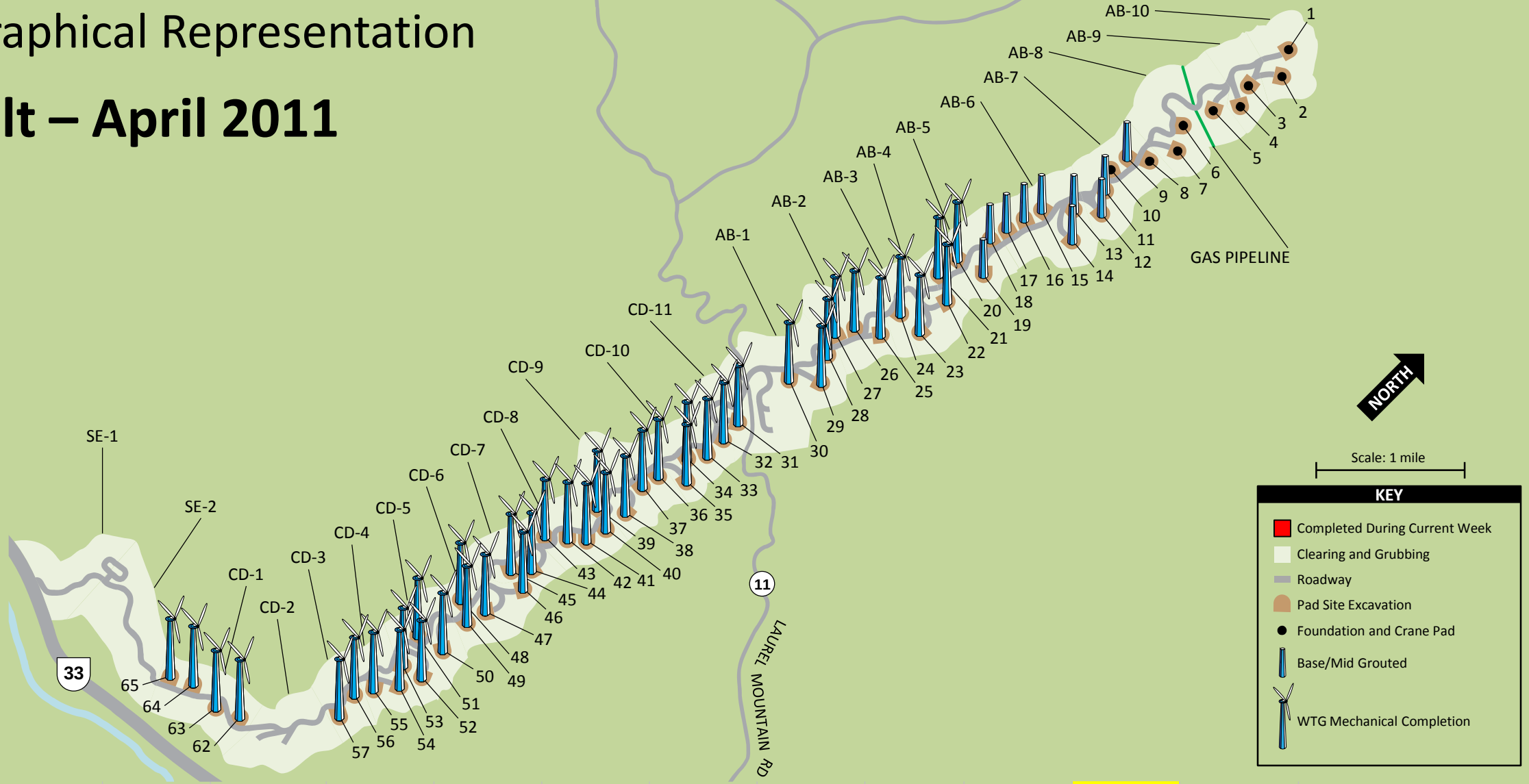
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30

JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – April 2011



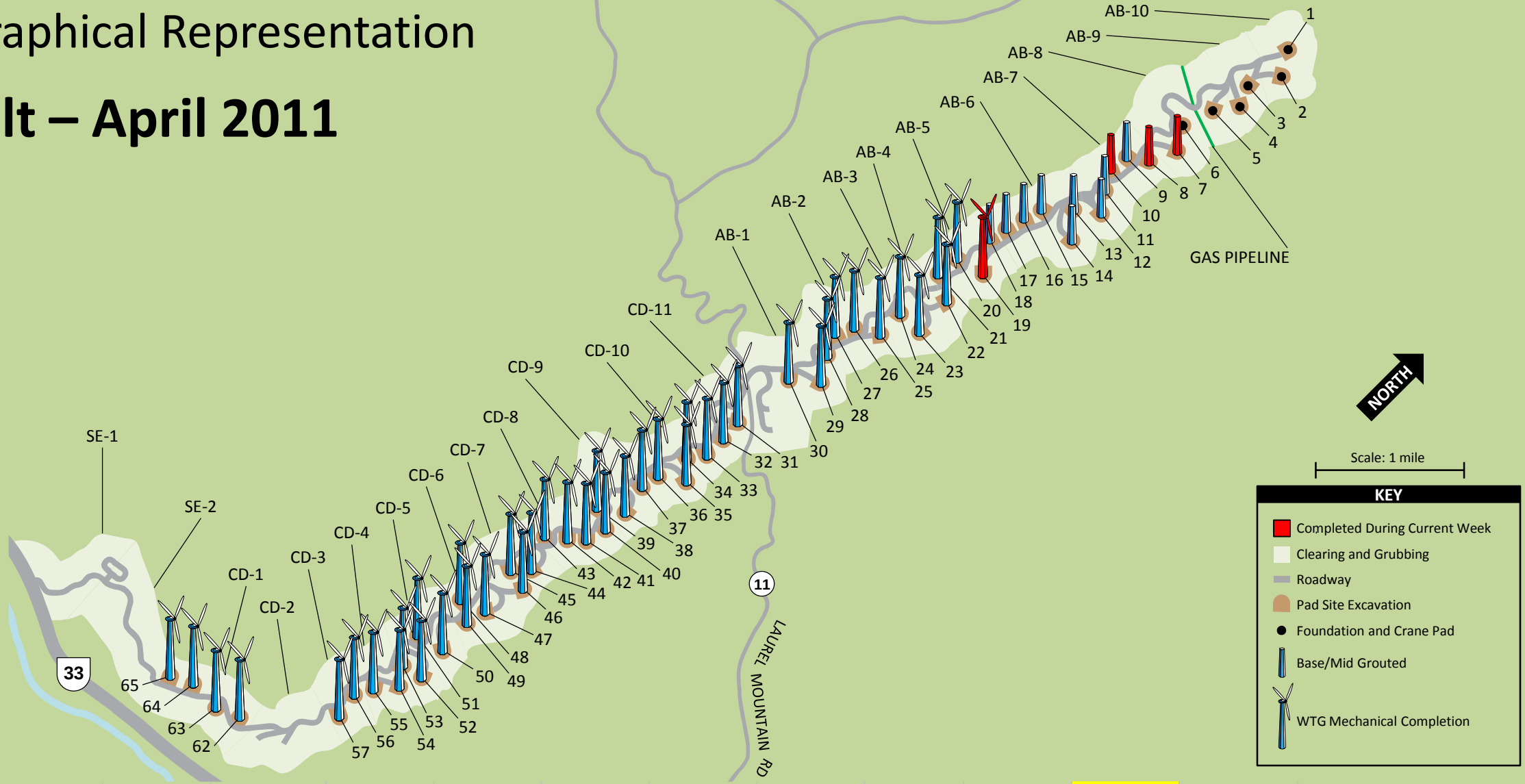
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011				MAR 2011				APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – April 2011



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

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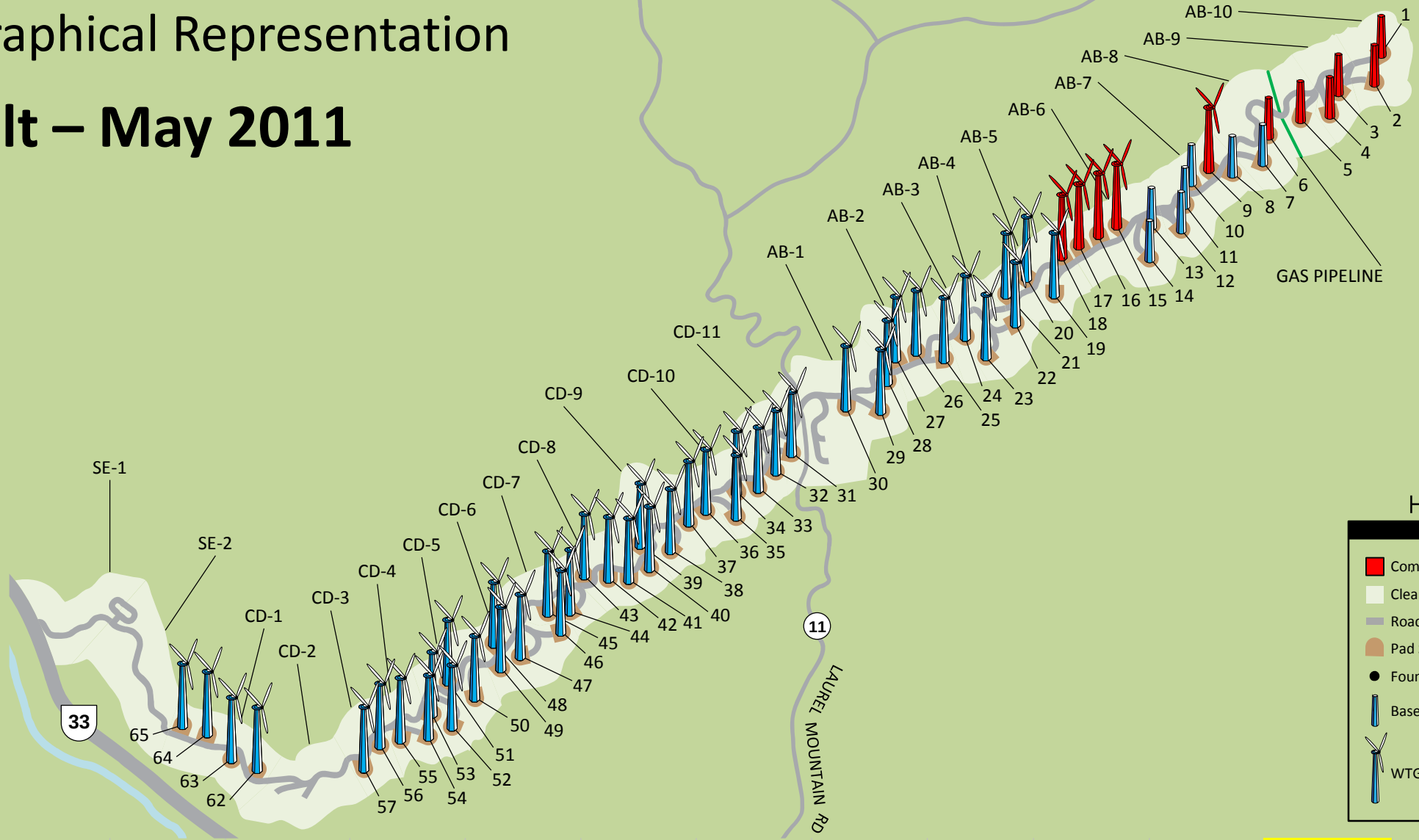
JUN 2010	JUL 2010	AUG 2010	SEP 2010	OCT 2010	NOV 2010	DEC 2010	JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011

III.A. Graphical Representation

As-Built – May 2011



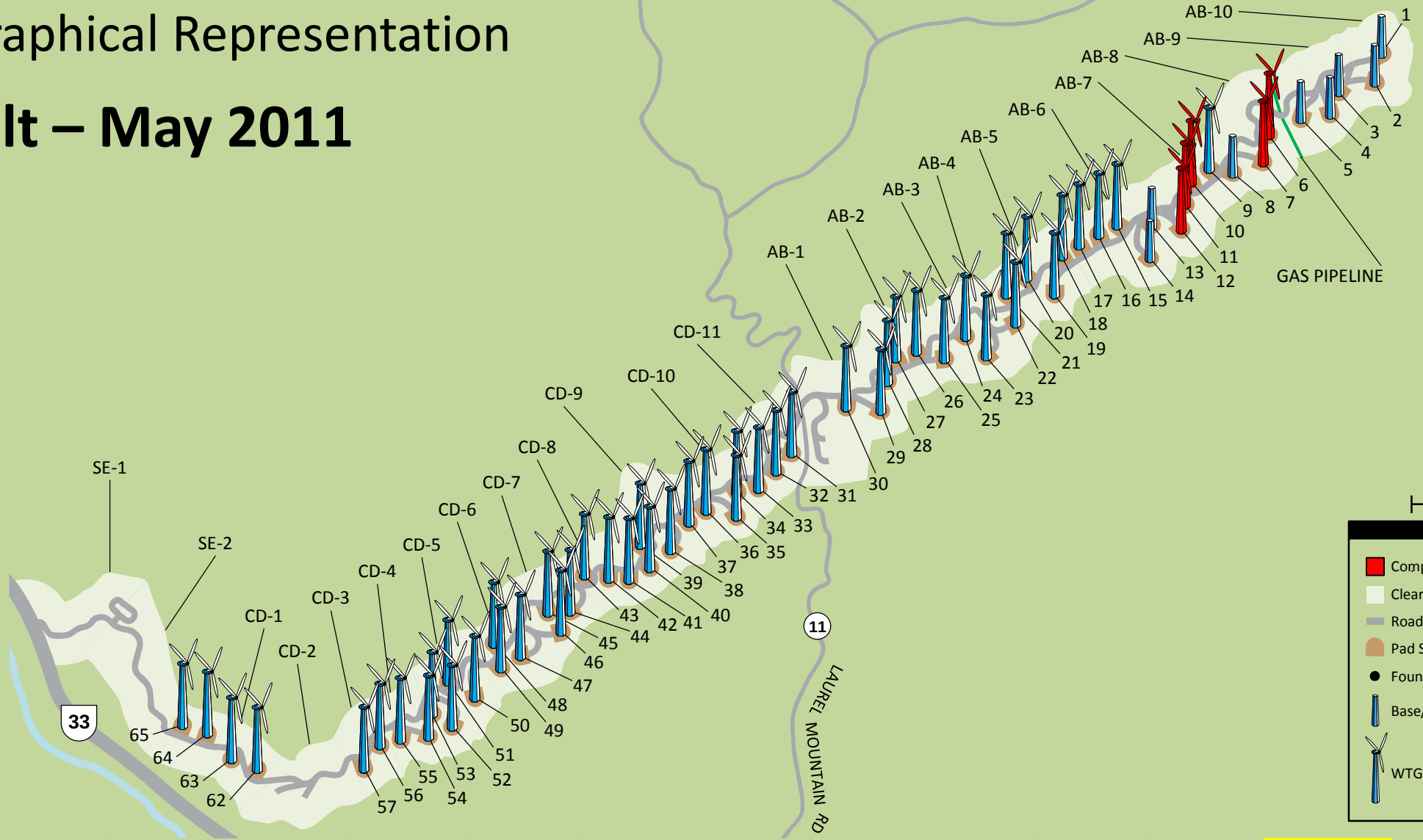
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011				MAR 2011				APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – May 2011



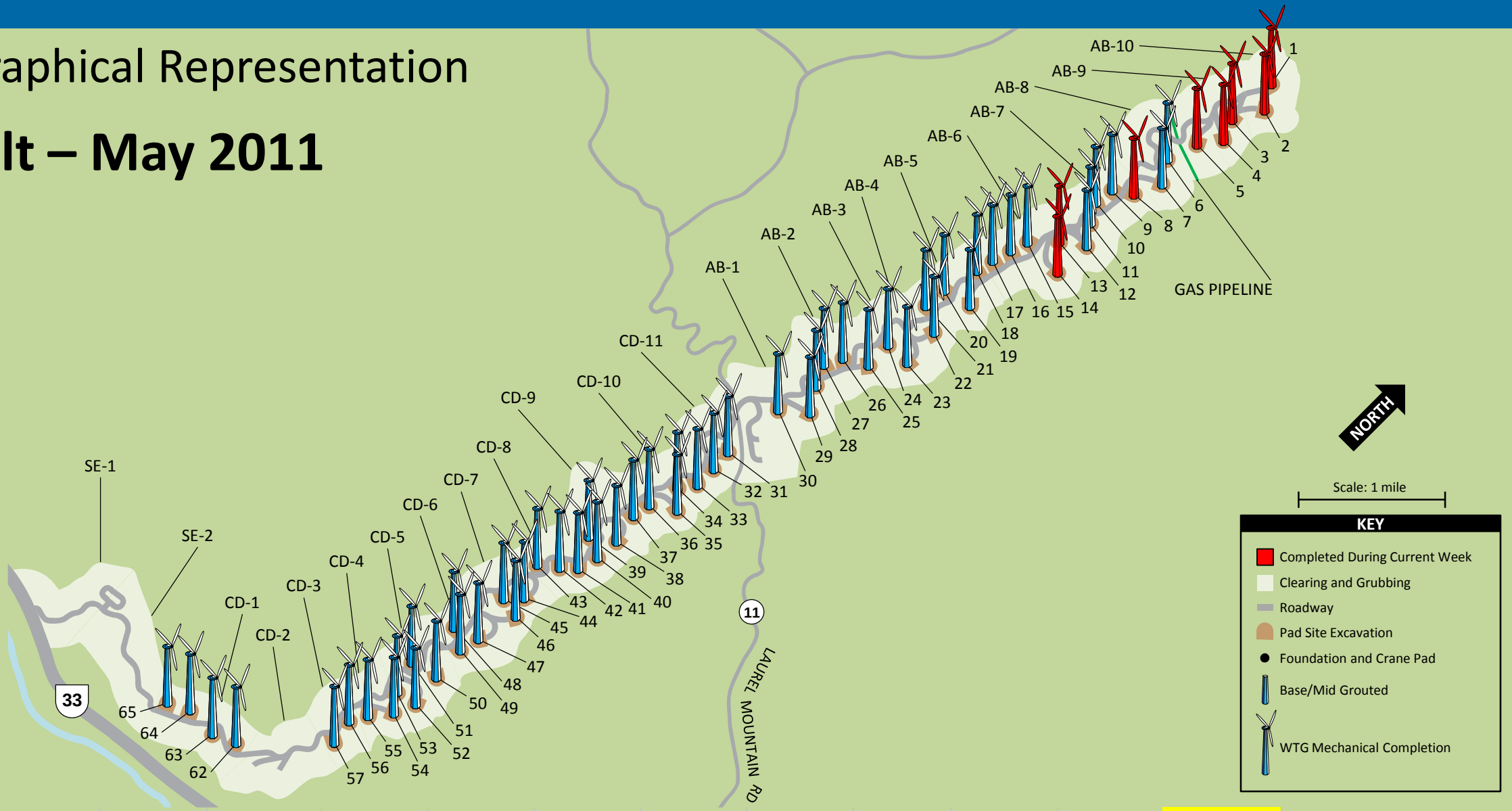
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011				MAR 2011				APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – May 2011



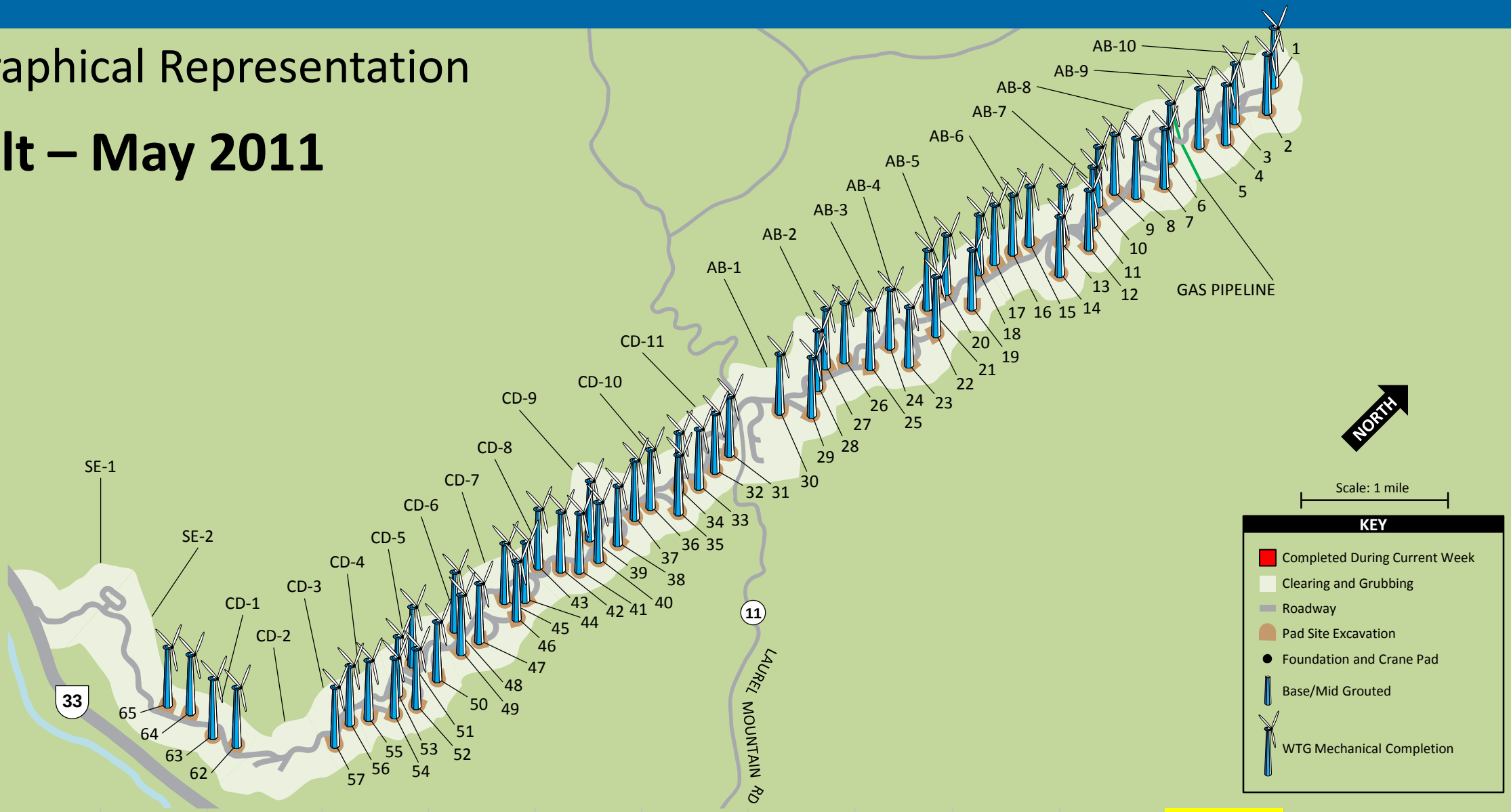
WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011				MAR 2011				APR 2011					MAY 2011				

III.A. Graphical Representation

As-Built – May 2011



WEEKS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

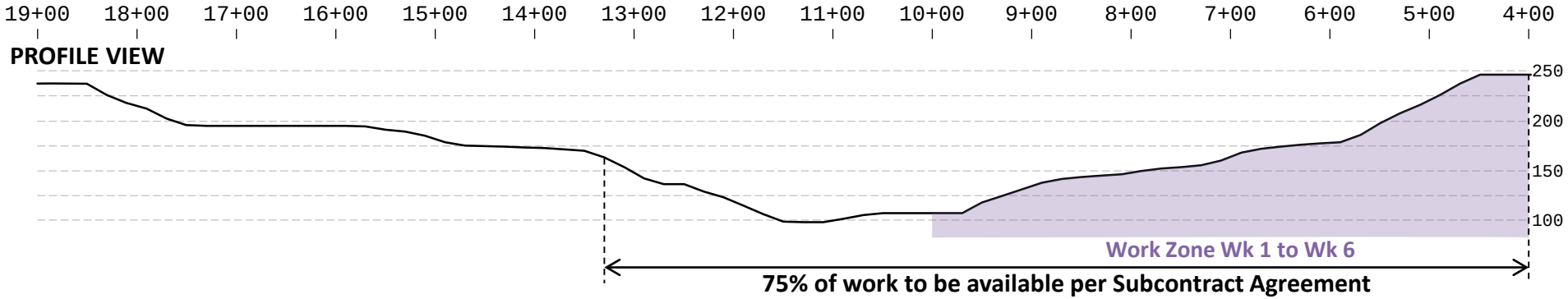
7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30
JUN 2010				JUL 2010				AUG 2010					SEP 2010					OCT 2010				NOV 2010					DEC 2010					JAN 2011					FEB 2011				MAR 2011				APR 2011					MAY 2011				


Rocky Pen Run Reservoir, VA

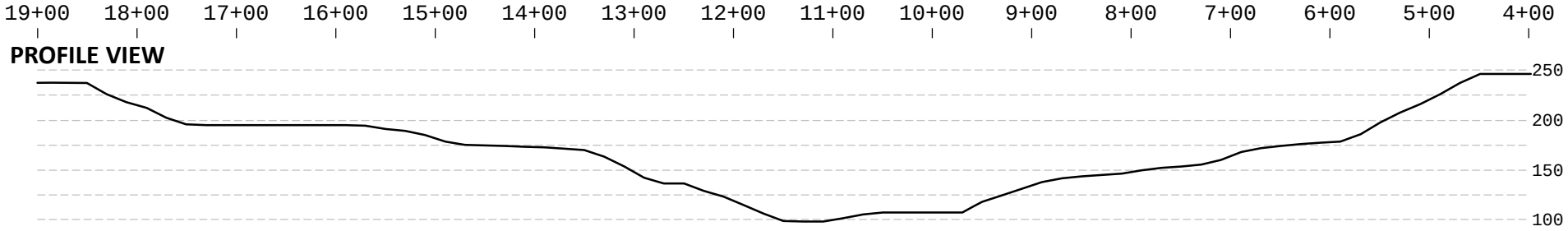
Anticipated vs. As-built Progression of Work Areas by Week

Production Drilling Anticipated to Start on 9/22/10

ANTICIPATED Grout Hole Drilling Sequence

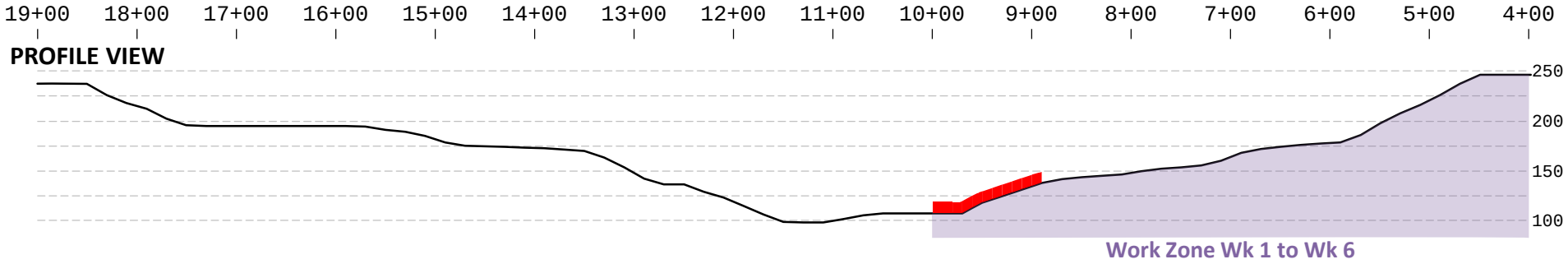


AS-BUILT Grout Hole Drilling Sequence

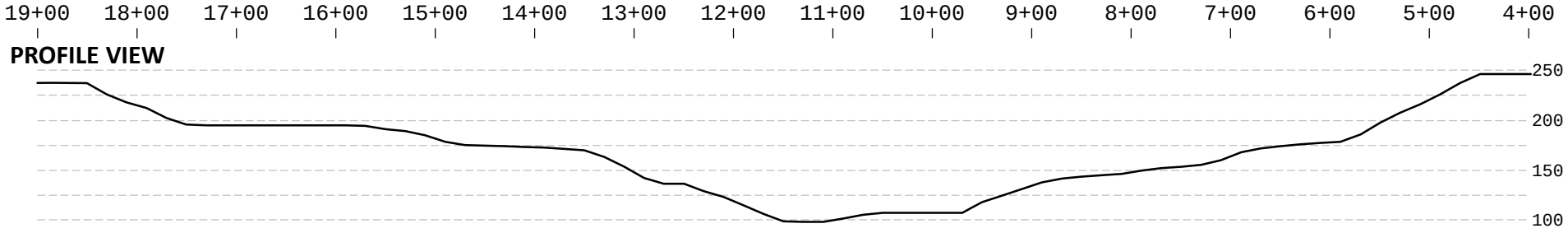


Week 1: 9/22/10 to 9/28/10

ANTICIPATED Grout Hole Drilling Sequence



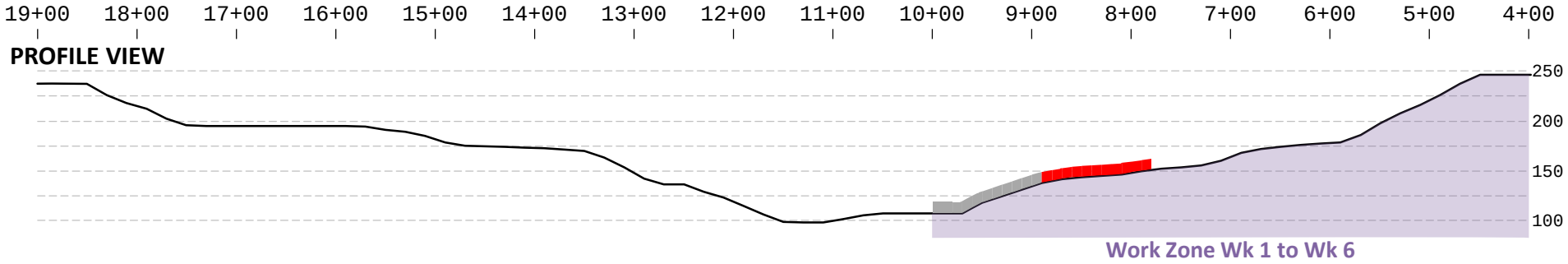
AS-BUILT Grout Hole Drilling Sequence



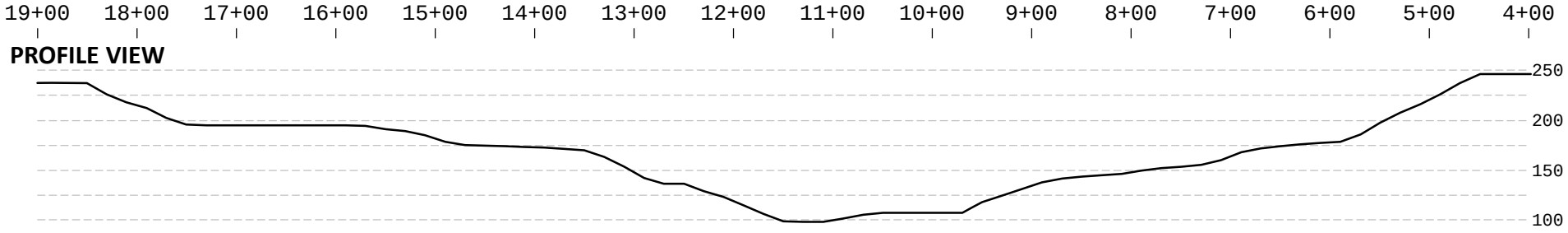
NO PRODUCTION DRILLING THIS WEEK

Week 2: 9/29/10 to 10/5/10

ANTICIPATED Grout Hole Drilling Sequence



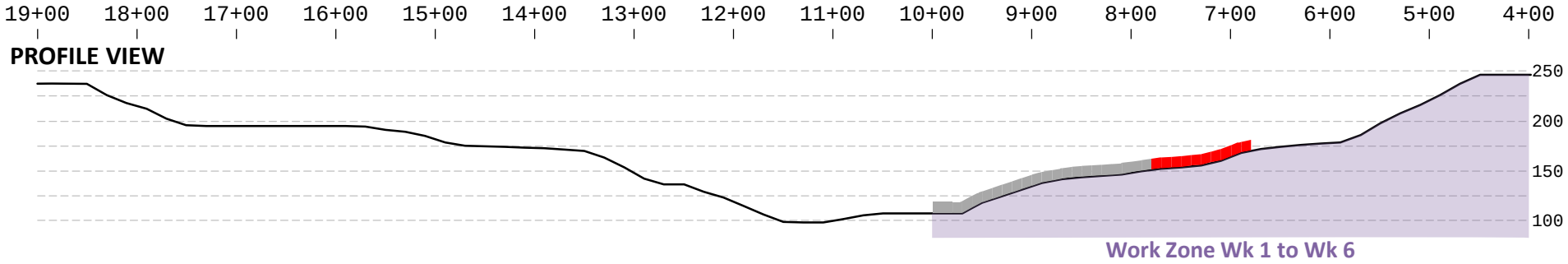
AS-BUILT Grout Hole Drilling Sequence



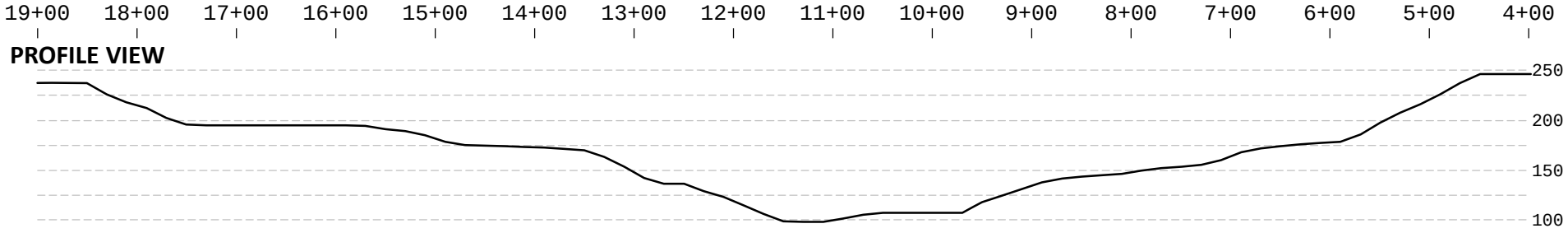
NO PRODUCTION DRILLING THIS WEEK

Week 3: 10/6/10 to 10/12/10

ANTICIPATED Grout Hole Drilling Sequence



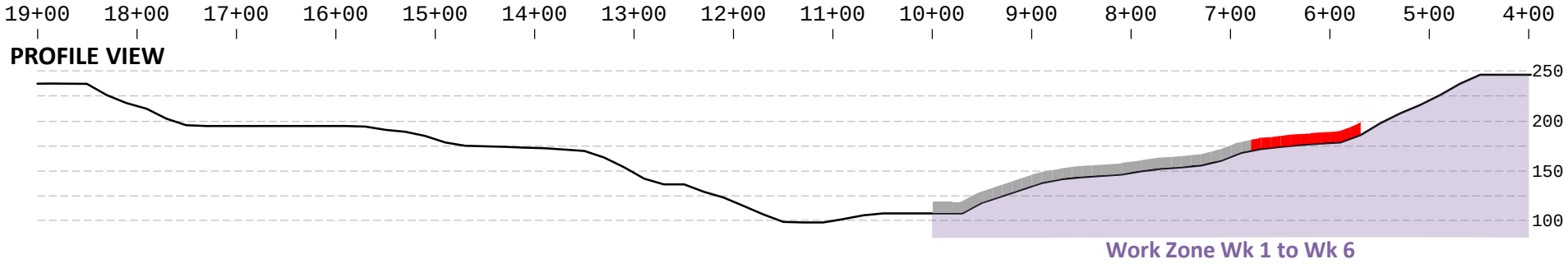
AS-BUILT Grout Hole Drilling Sequence



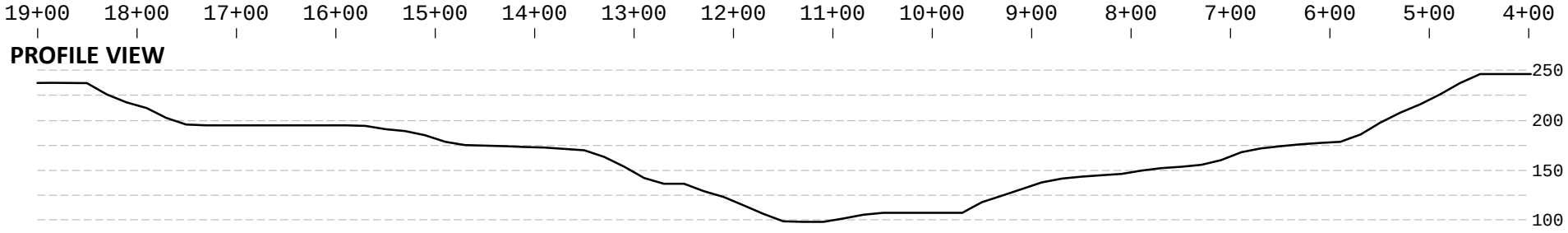
NO PRODUCTION DRILLING THIS WEEK

Week 4: 10/14/10 to 10/19/10

ANTICIPATED Grout Hole Drilling Sequence



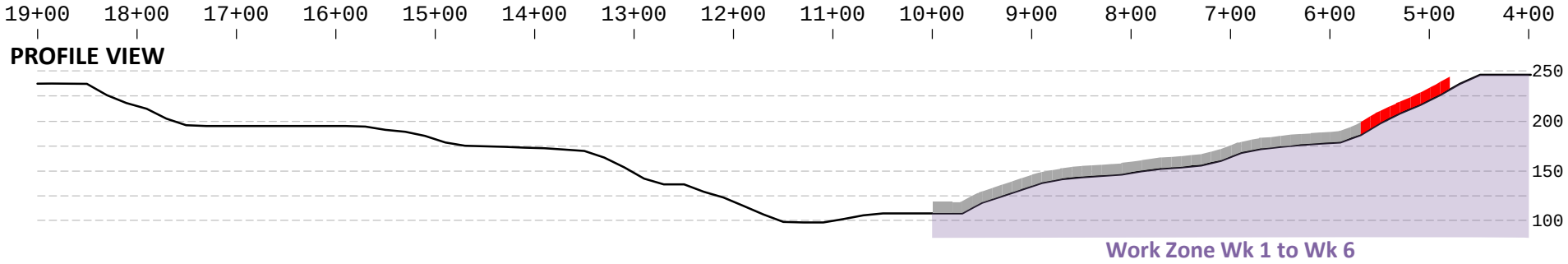
AS-BUILT Grout Hole Drilling Sequence



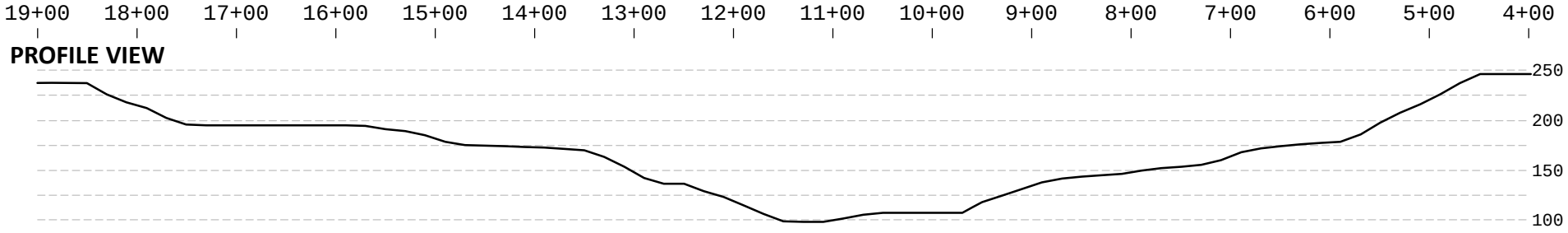
NO PRODUCTION DRILLING THIS WEEK

Week 5: 10/20/10 to 10/26/10

ANTICIPATED Grout Hole Drilling Sequence



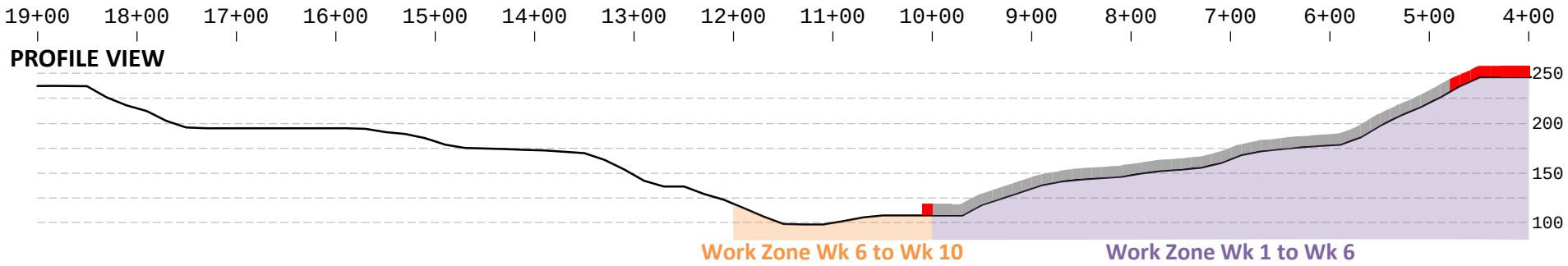
AS-BUILT Grout Hole Drilling Sequence



NO PRODUCTION DRILLING THIS WEEK

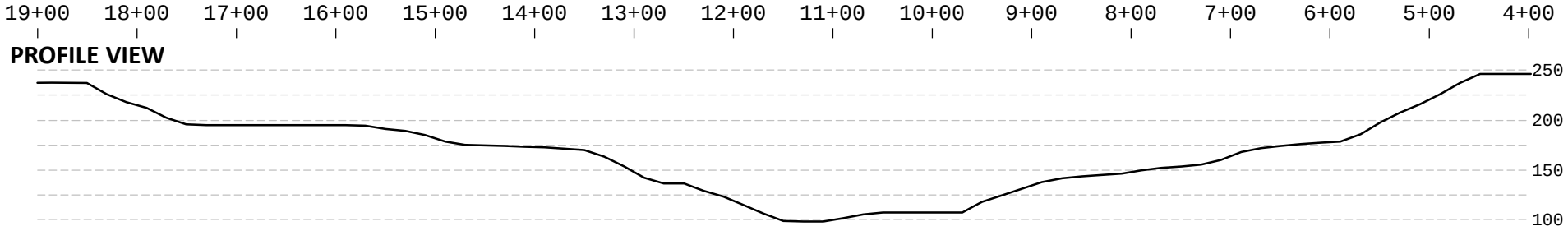
Week 6: 10/27/10 to 11/2/10

ANTICIPATED Grout Hole Drilling Sequence



RIGHT SIDE COMPLETE. BEGIN MIDDLE.

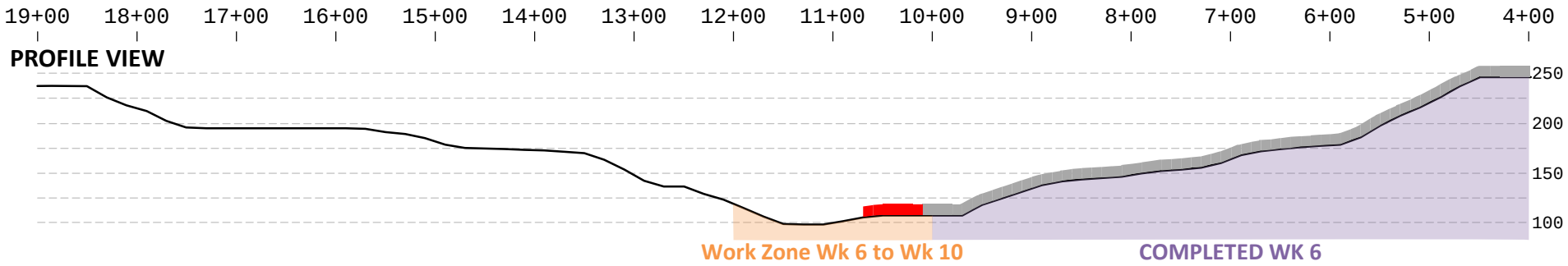
AS-BUILT Grout Hole Drilling Sequence



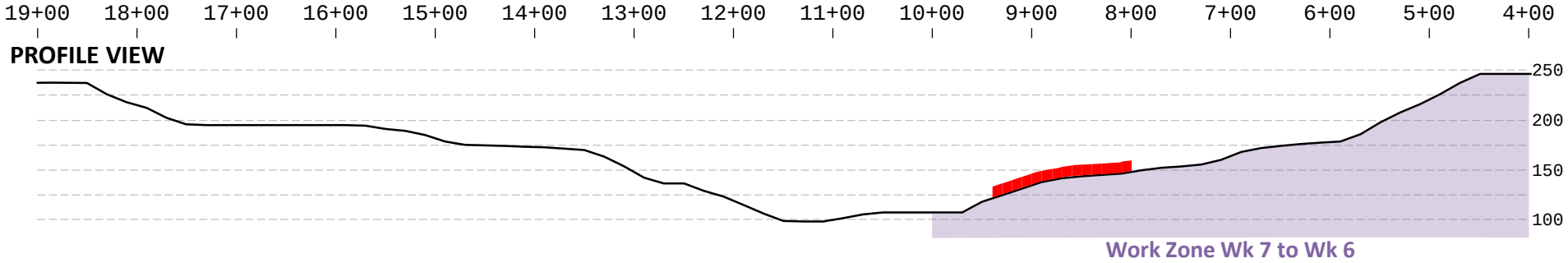
NO PRODUCTION DRILLING THIS WEEK

Week 7: 11/3/10 to 11/9/10

ANTICIPATED Grout Hole Drilling Sequence



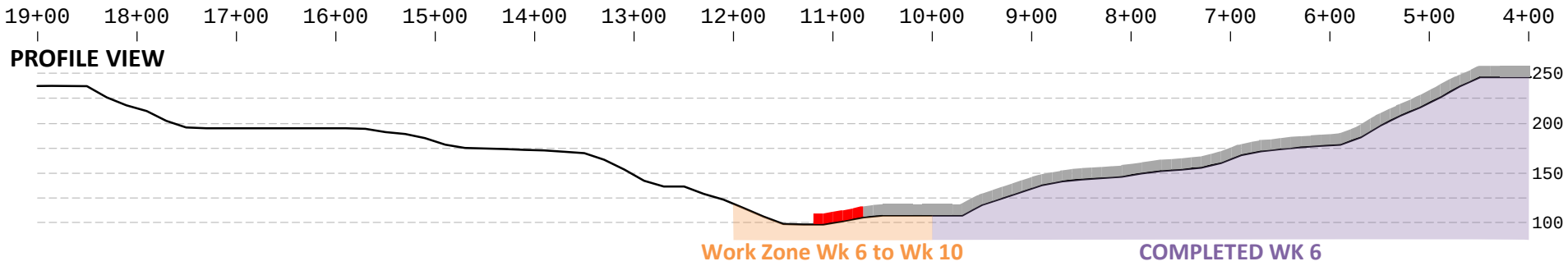
AS-BUILT Grout Hole Drilling Sequence



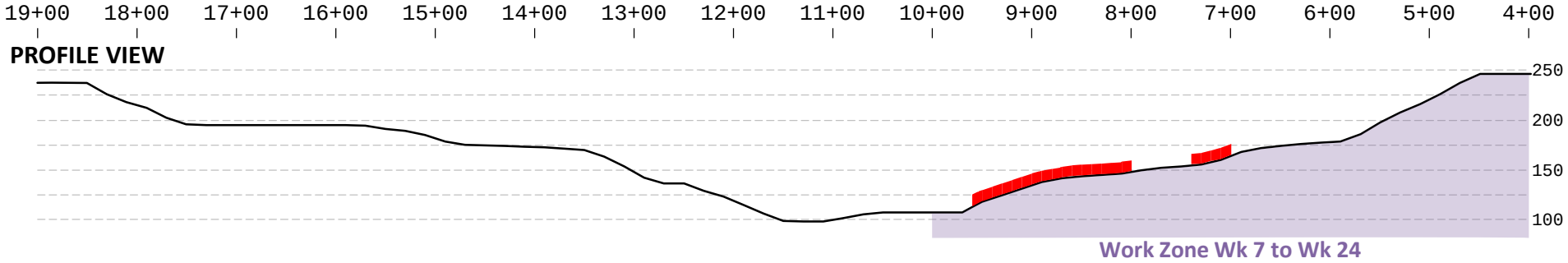
PRODUCTION DRILLING STARTS ON 11/8/10

Week 8: 11/10/10 to 11/16/10

ANTICIPATED Grout Hole Drilling Sequence

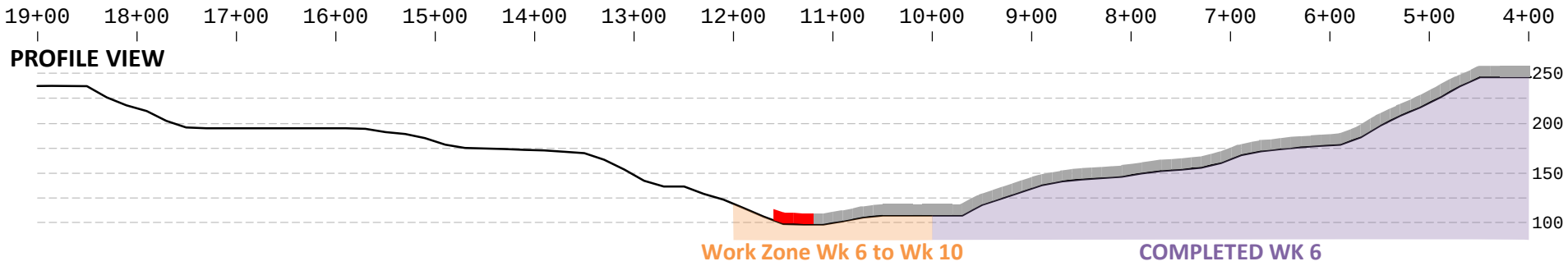


AS-BUILT Grout Hole Drilling Sequence

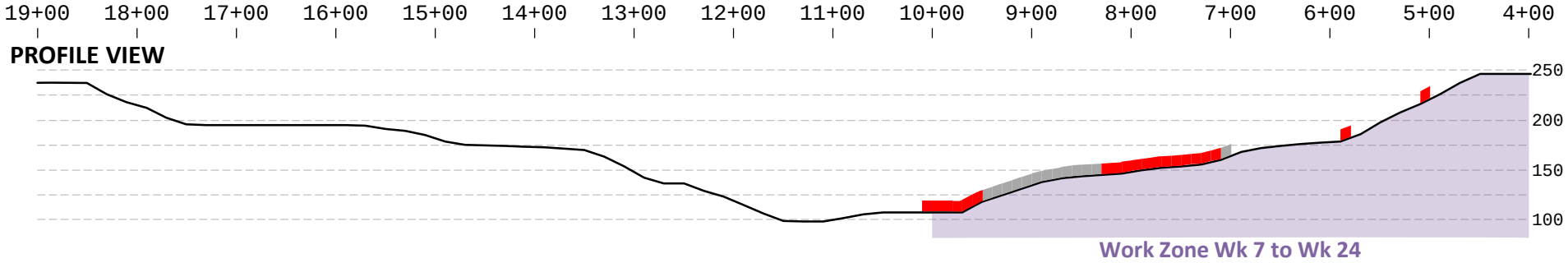


Week 9: 11/17/10 to 11/23/10

ANTICIPATED Grout Hole Drilling Sequence

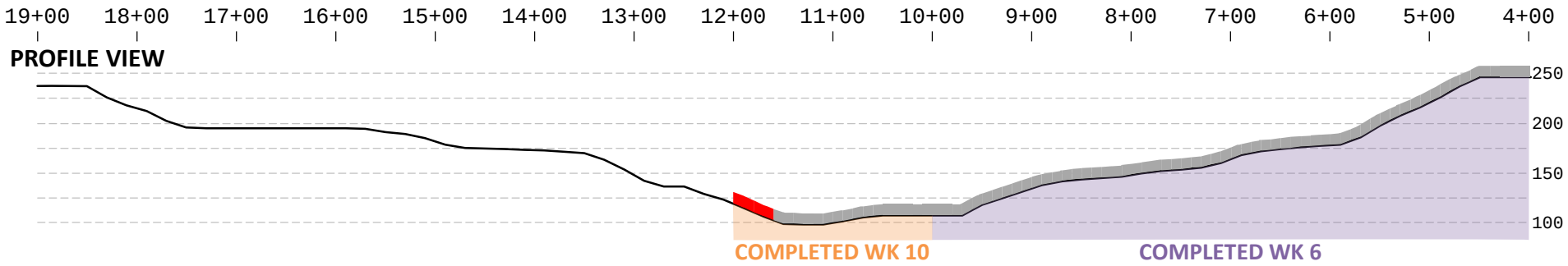


AS-BUILT Grout Hole Drilling Sequence



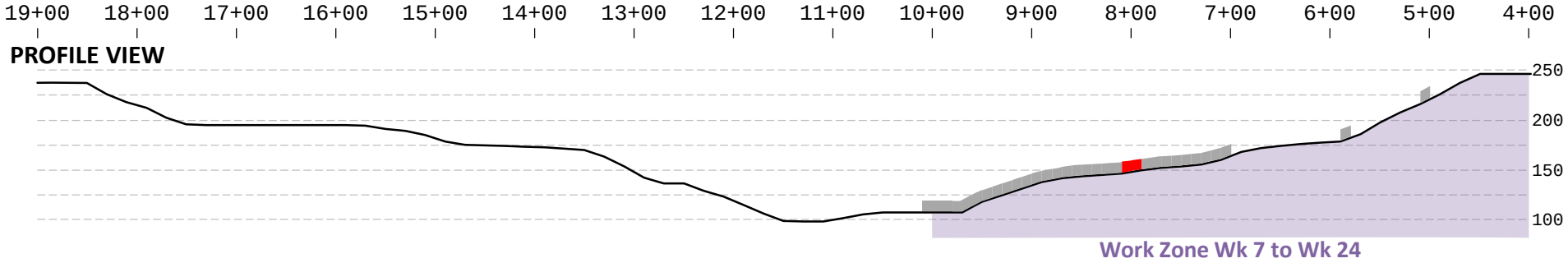
Week 10: 11/24/10 to 11/30/10

ANTICIPATED Grout Hole Drilling Sequence



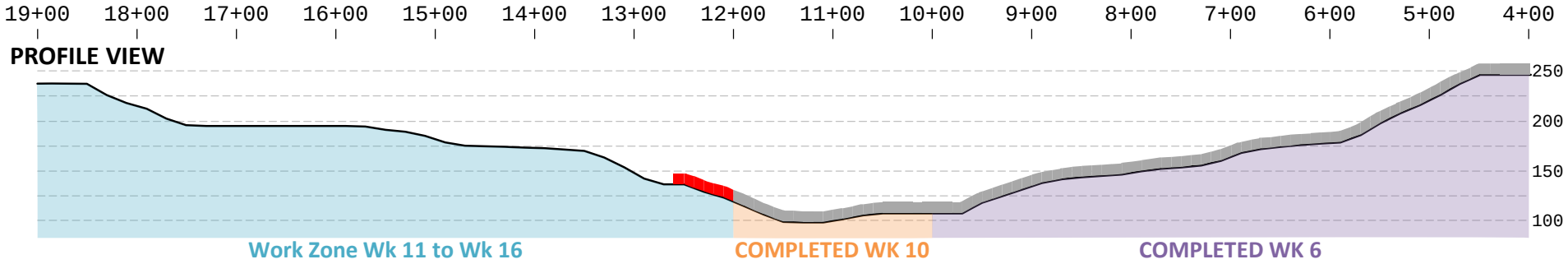
MIDDLE COMPLETE. BEGIN LEFT SIDE.

AS-BUILT Grout Hole Drilling Sequence

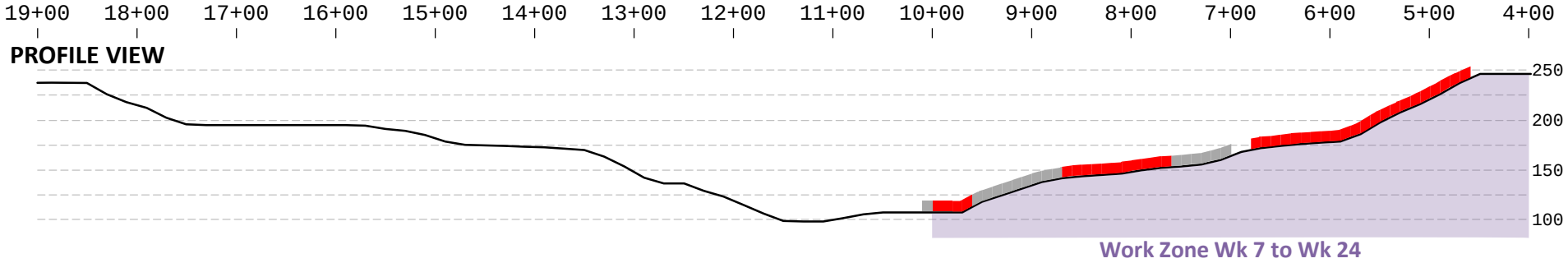


Week 11: 12/1/10 to 12/7/10

ANTICIPATED Grout Hole Drilling Sequence

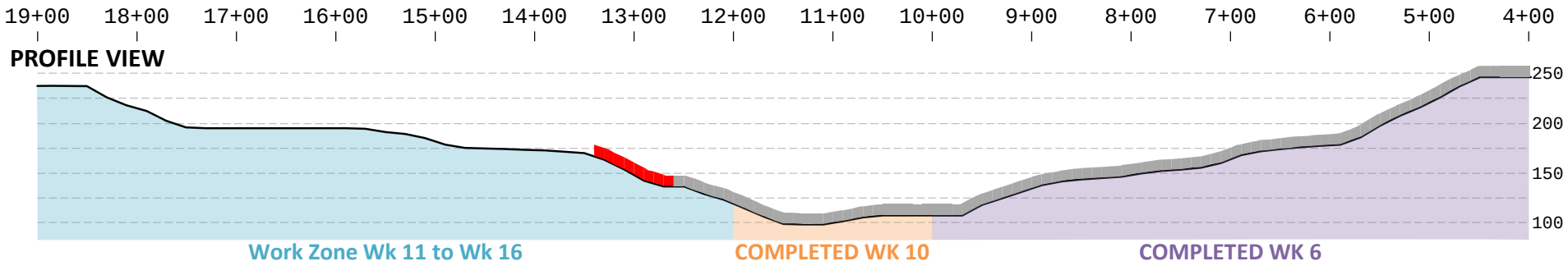


AS-BUILT Grout Hole Drilling Sequence

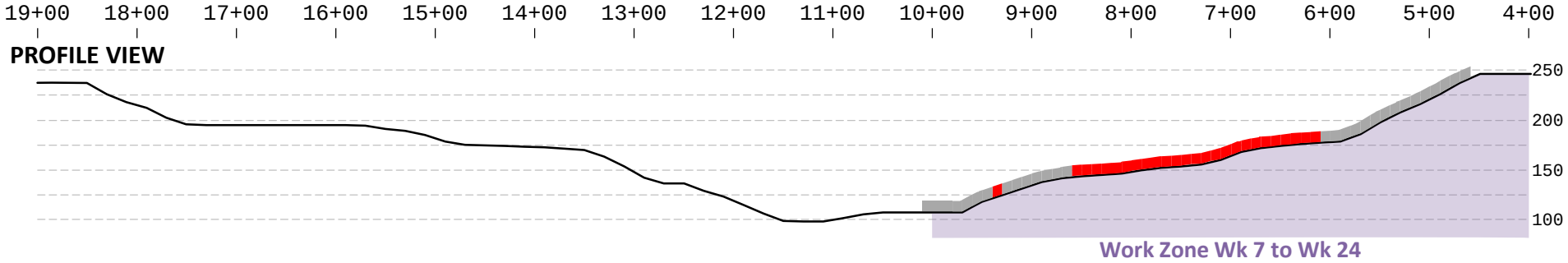


Week 12: 12/8/10 to 12/14/10

ANTICIPATED Grout Hole Drilling Sequence

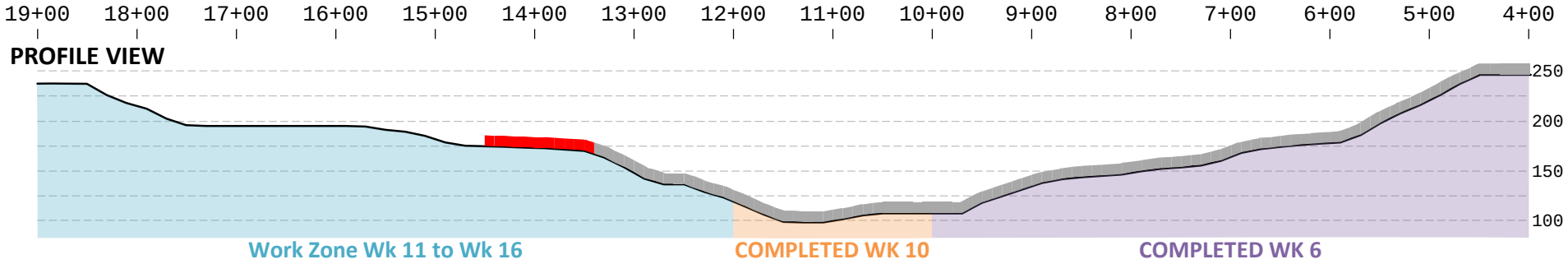


AS-BUILT Grout Hole Drilling Sequence

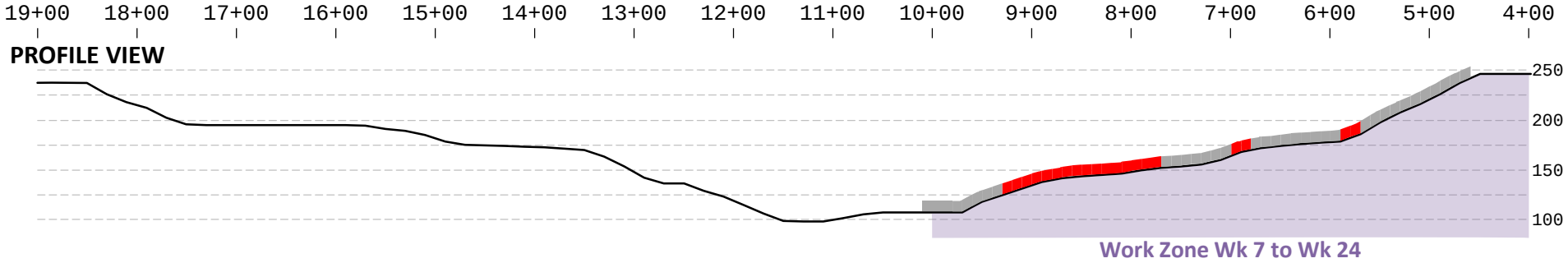


Week 13: 12/15/10 to 12/21/10

ANTICIPATED Grout Hole Drilling Sequence

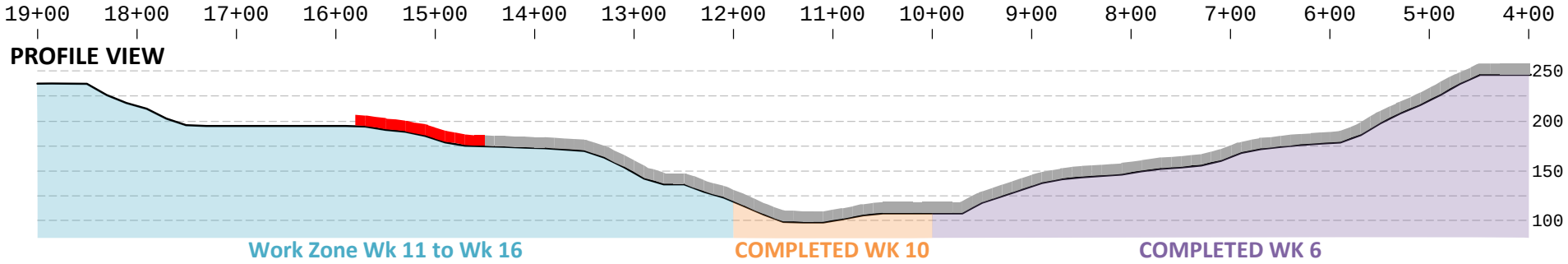


AS-BUILT Grout Hole Drilling Sequence

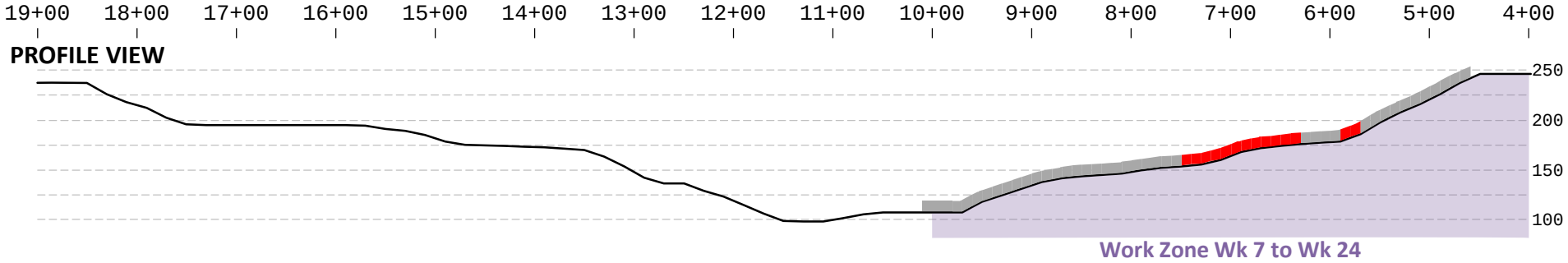


Week 14: 12/22/10 to 12/28/10

ANTICIPATED Grout Hole Drilling Sequence

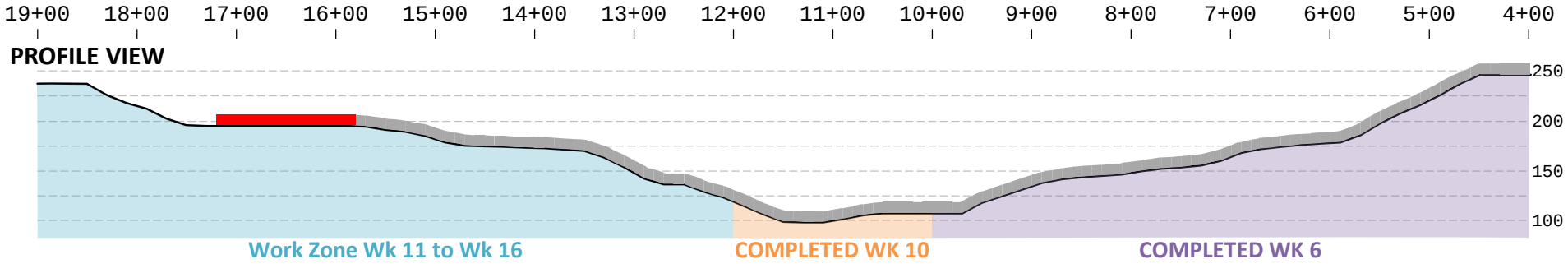


AS-BUILT Grout Hole Drilling Sequence

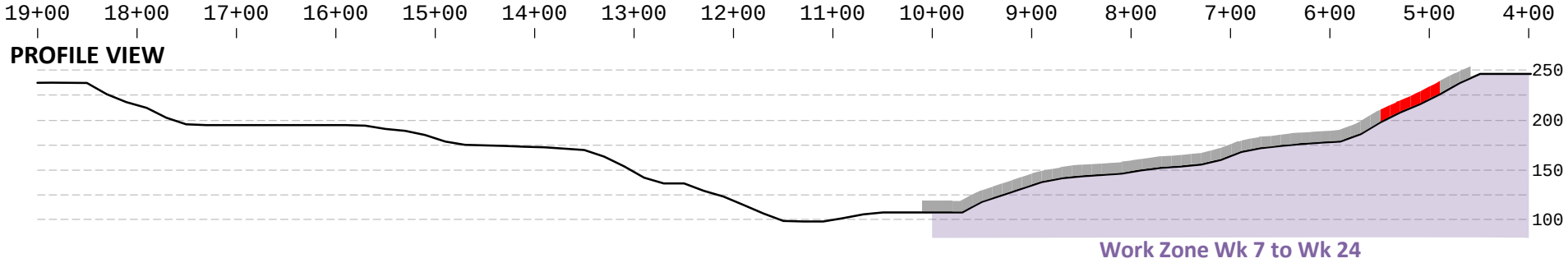


Week 15: 12/29/10 to 1/4/11

ANTICIPATED Grout Hole Drilling Sequence

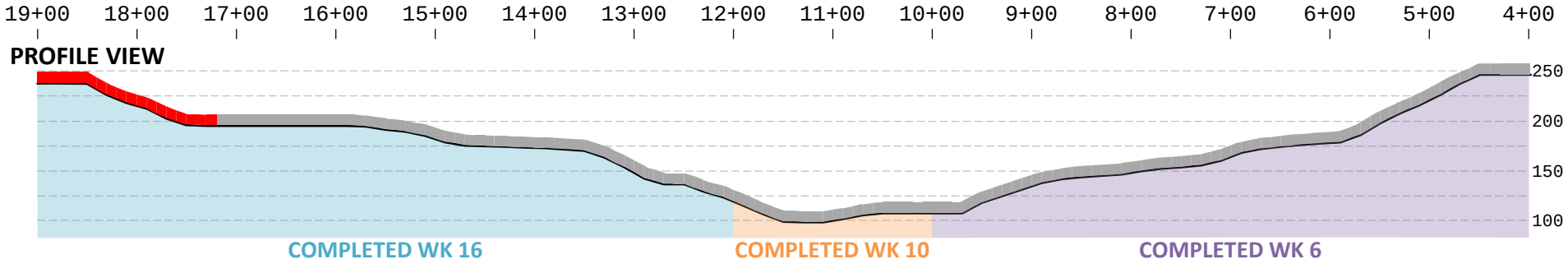


AS-BUILT Grout Hole Drilling Sequence



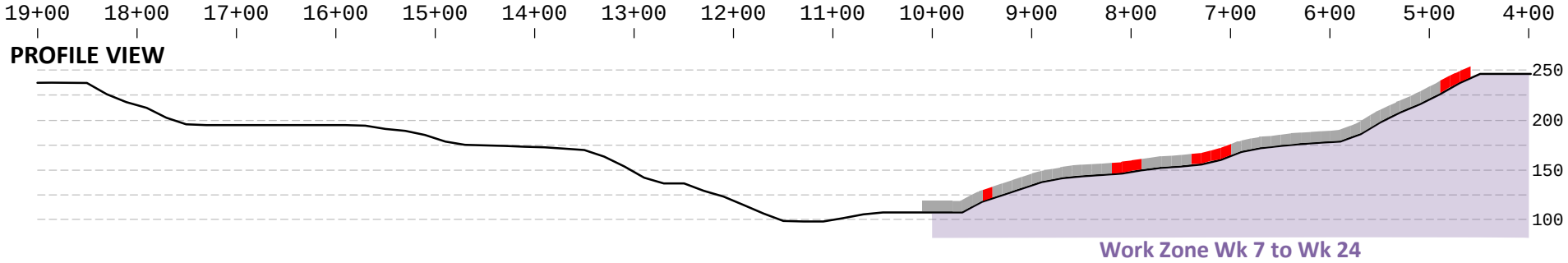
Week 16: 1/5/11 to 1/11/11

ANTICIPATED Grout Hole Drilling Sequence



PRODUCTION DRILLING 100% COMPLETE ON 1/11/11

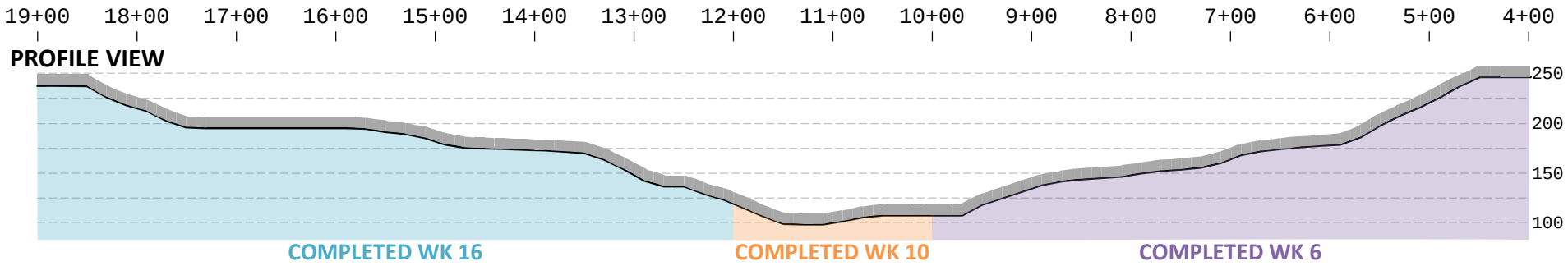
AS-BUILT Grout Hole Drilling Sequence



PRODUCTION DRILLING 18.52% COMPLETE ON 1/11/11

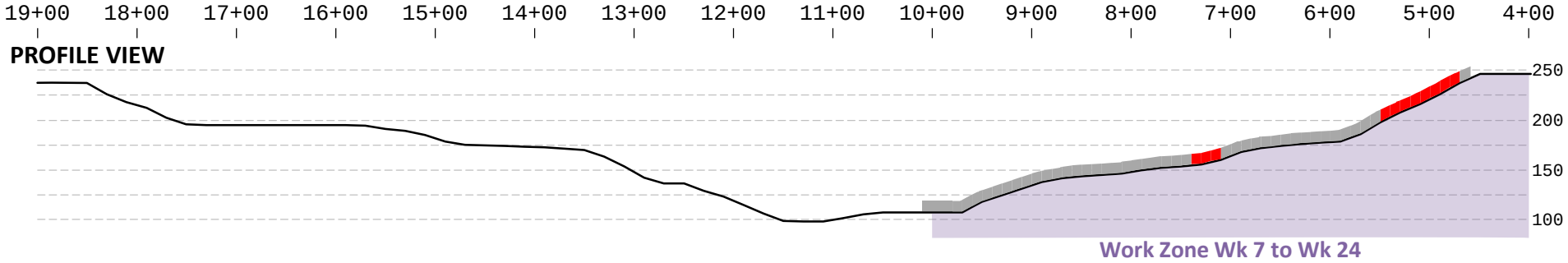
Week 17: 1/12/11 to 1/18/11

ANTICIPATED Grout Hole Drilling Sequence



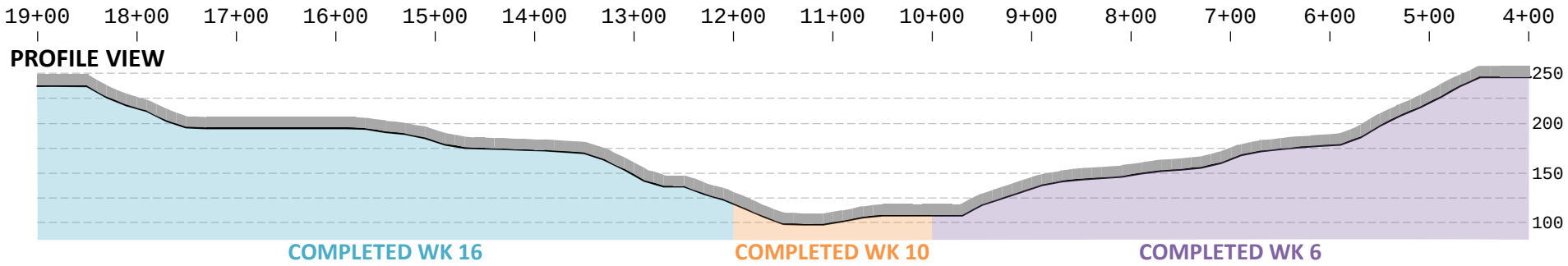
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



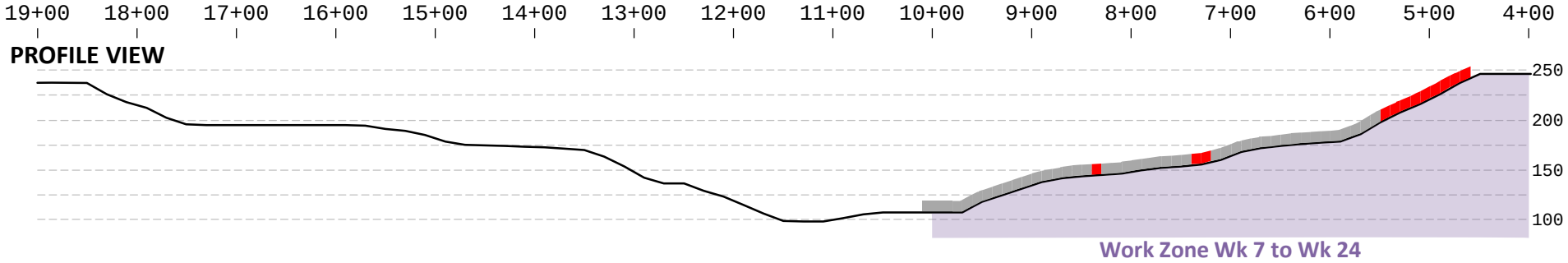
Week 18: 1/19/11 to 1/25/11

ANTICIPATED Grout Hole Drilling Sequence



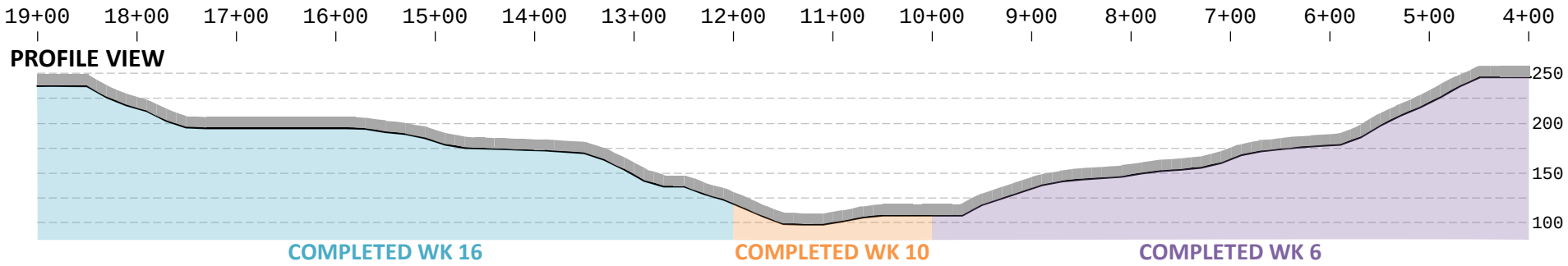
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



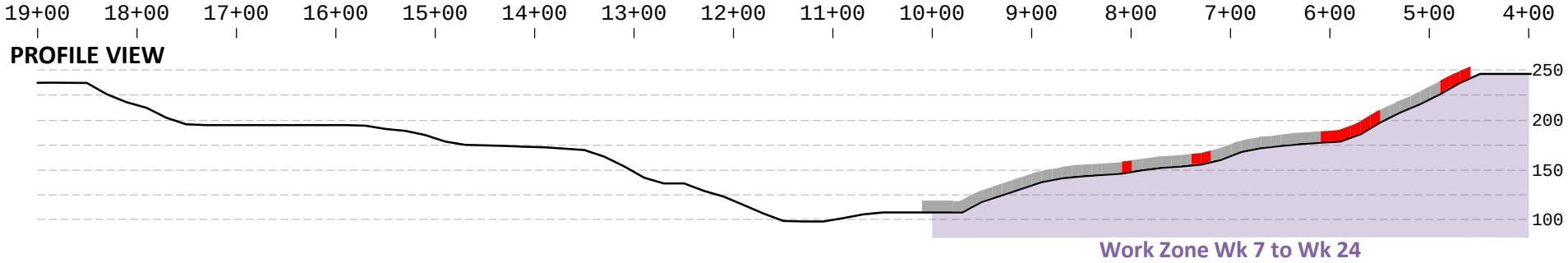
Week 19: 1/26/11 to 2/1/11

ANTICIPATED Grout Hole Drilling Sequence



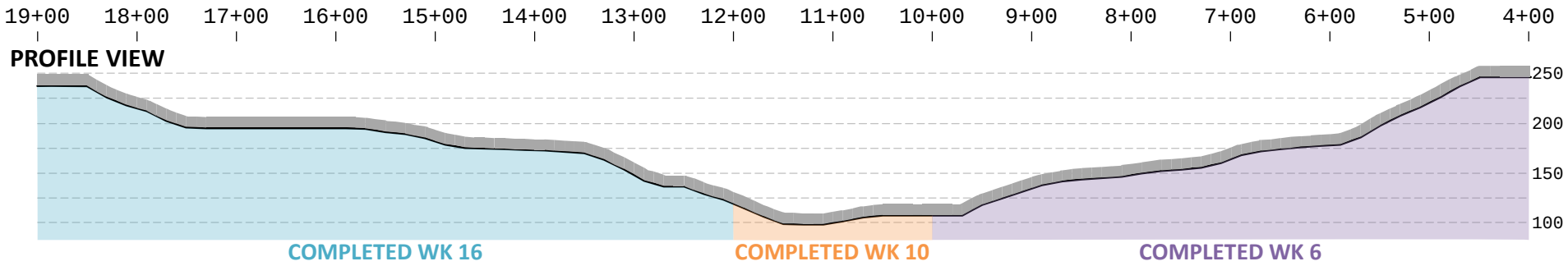
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



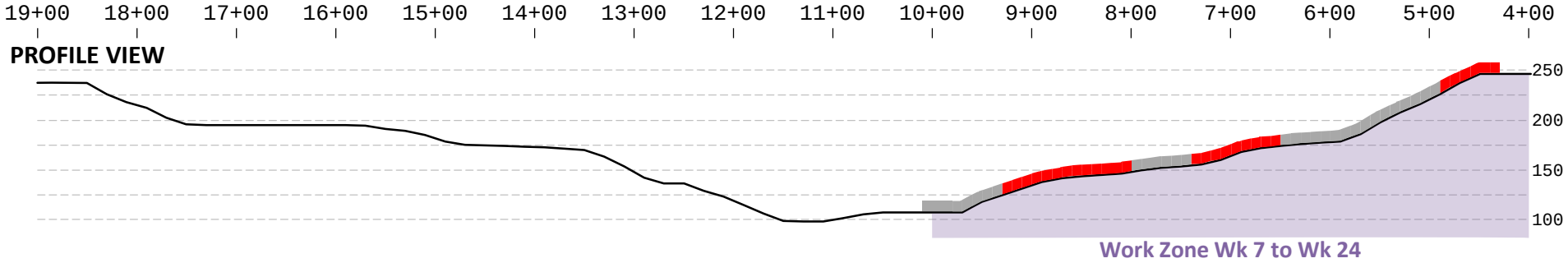
Week 20: 2/2/11 to 2/8/11

ANTICIPATED Grout Hole Drilling Sequence



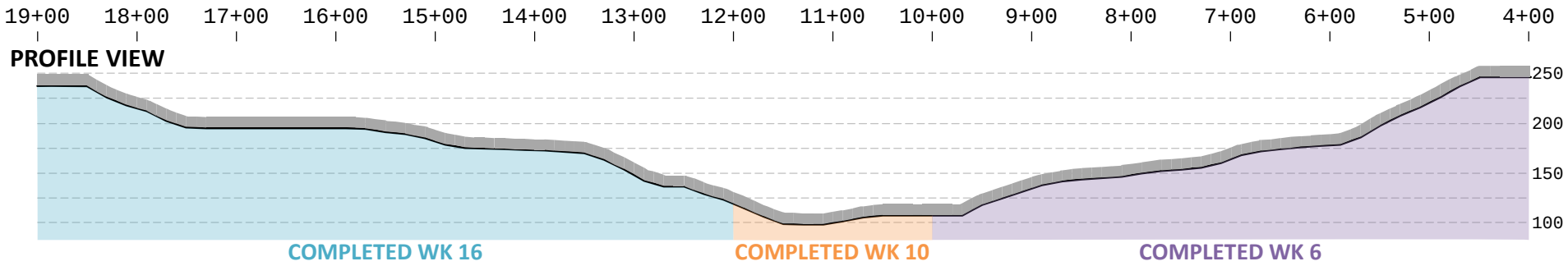
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



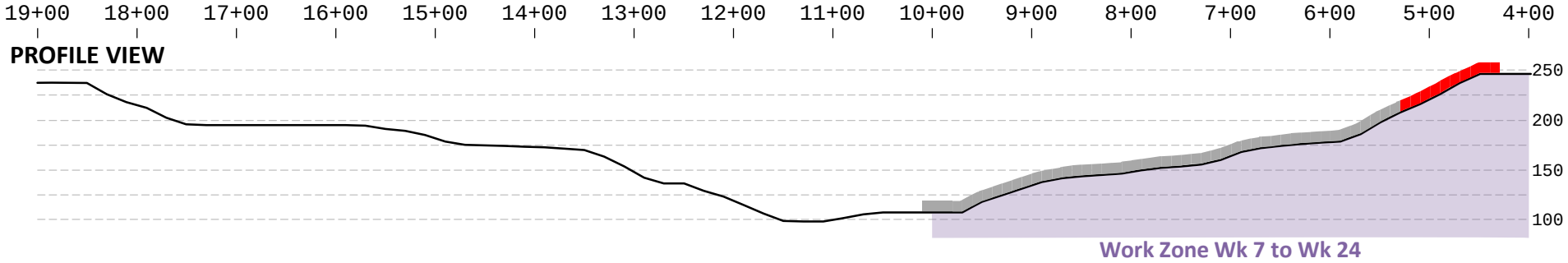
Week 21: 2/9/11 to 2/15/11

ANTICIPATED Grout Hole Drilling Sequence



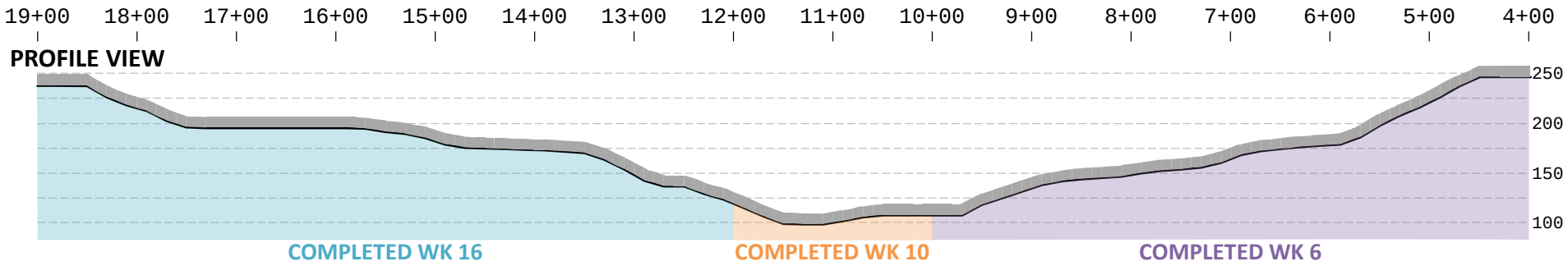
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



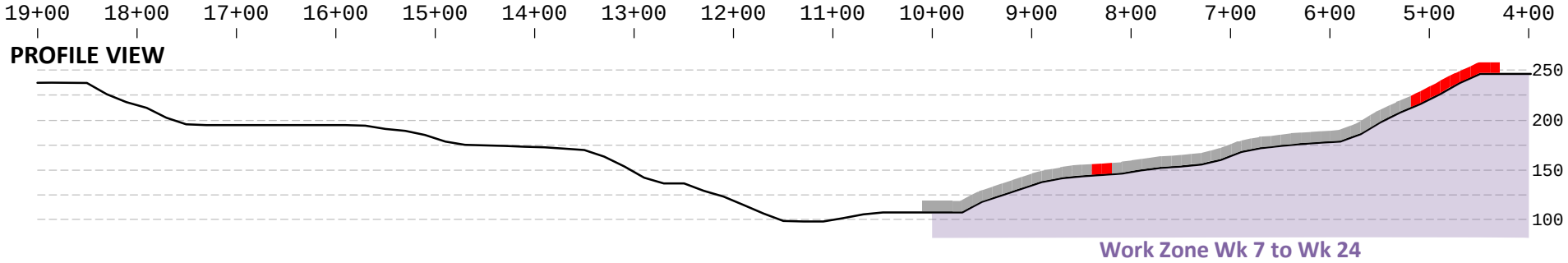
Week 22: 2/16/11 to 2/22/11

ANTICIPATED Grout Hole Drilling Sequence



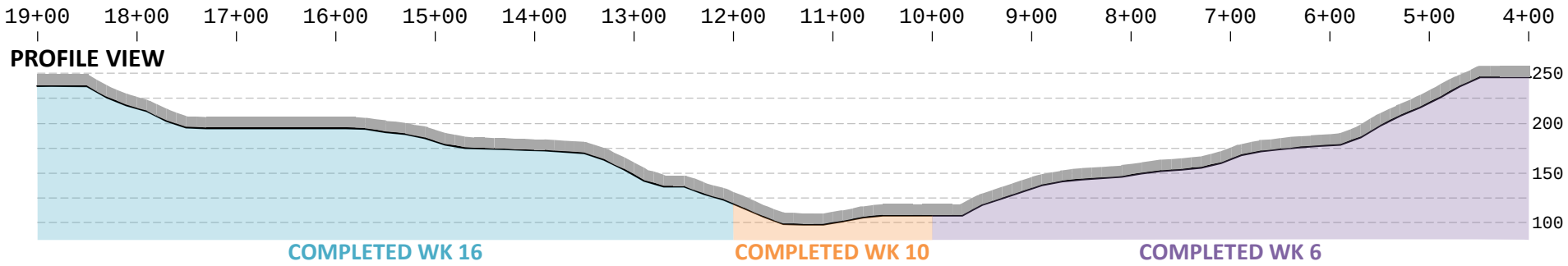
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



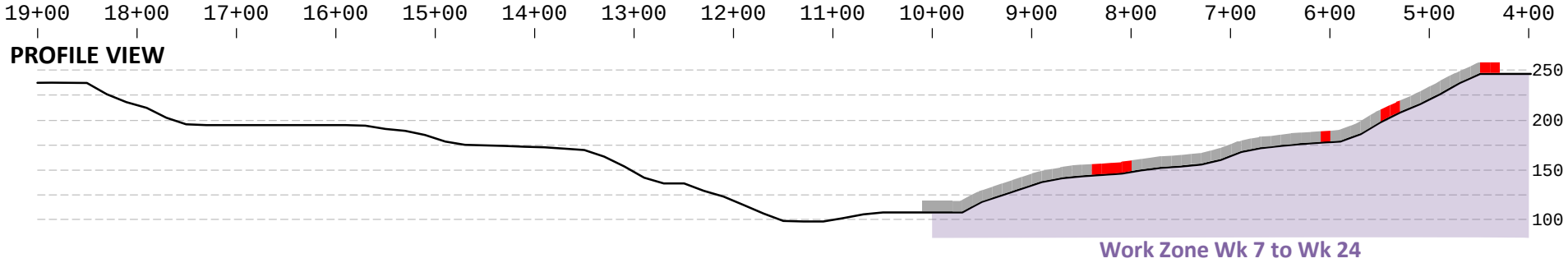
Week 23: 2/23/11 to 3/1/11

ANTICIPATED Grout Hole Drilling Sequence



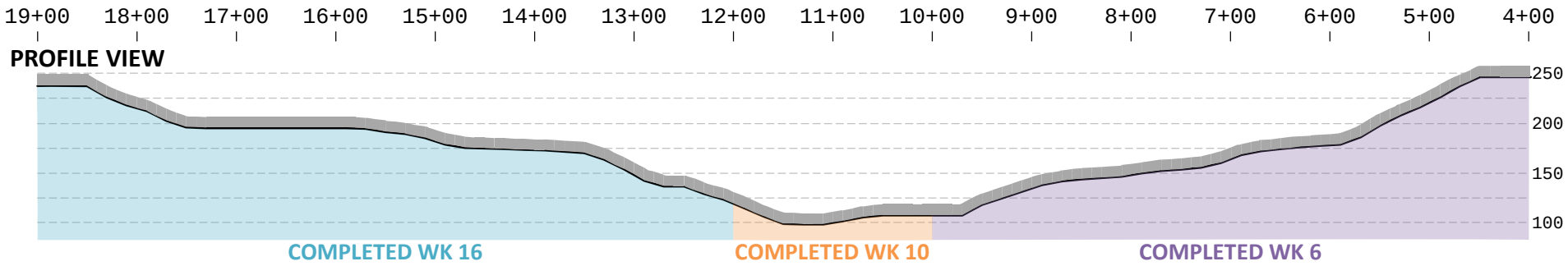
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



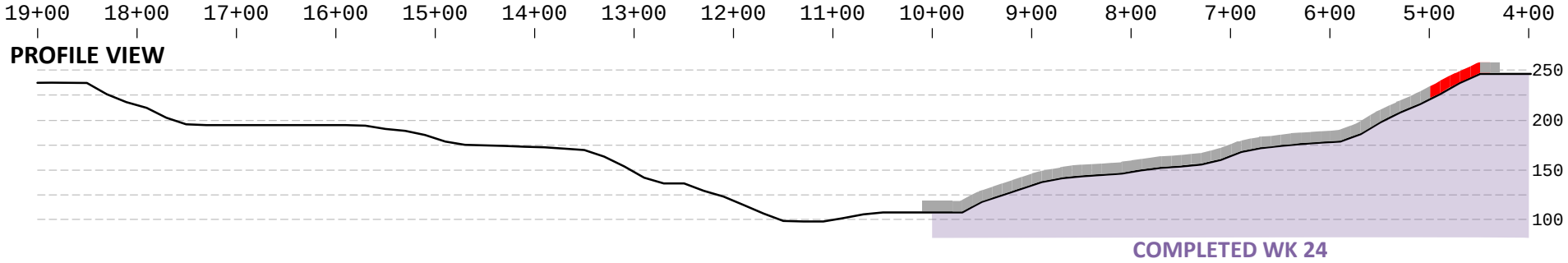
Week 24: 3/2/11 to 3/8/11

ANTICIPATED Grout Hole Drilling Sequence



PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence

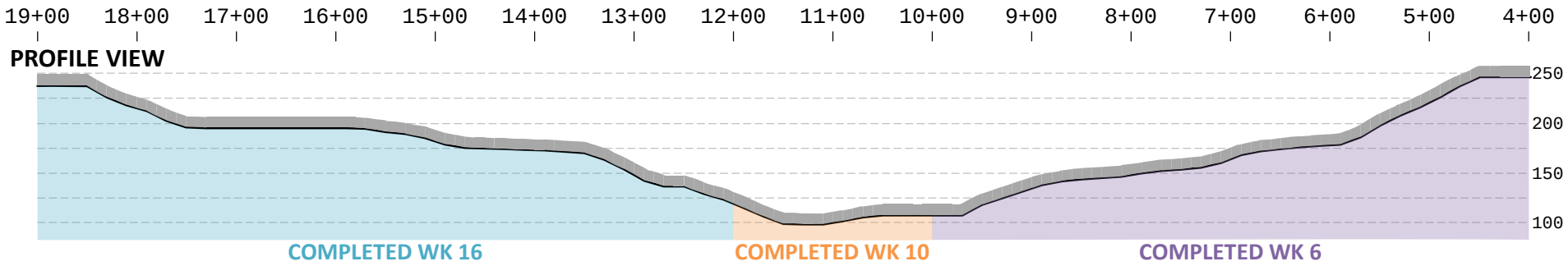


RIGHT SIDE COMPLETED 18 WKS LATER THAN ANTICIPATED.

BEGIN LEFT SIDE

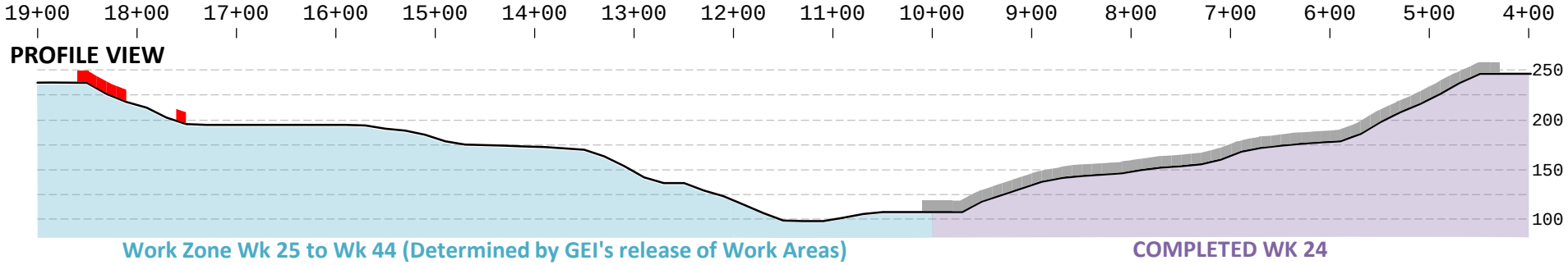
Week 25: 3/9/11 to 3/15/11

ANTICIPATED Grout Hole Drilling Sequence



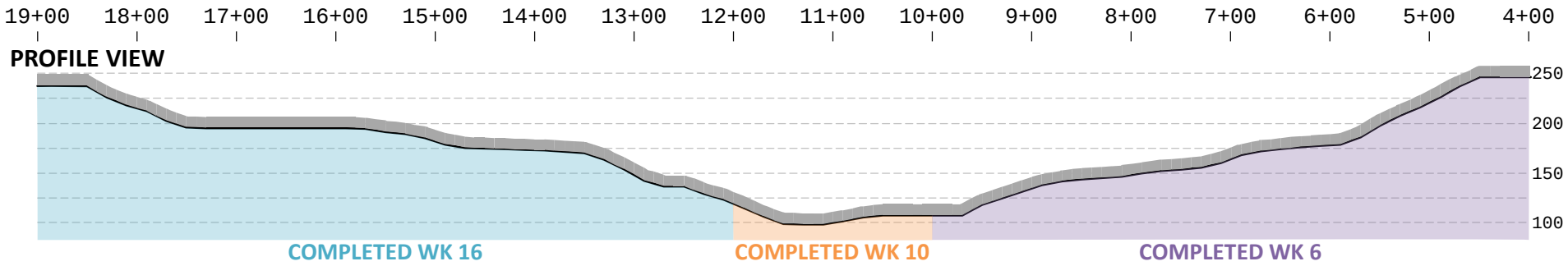
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



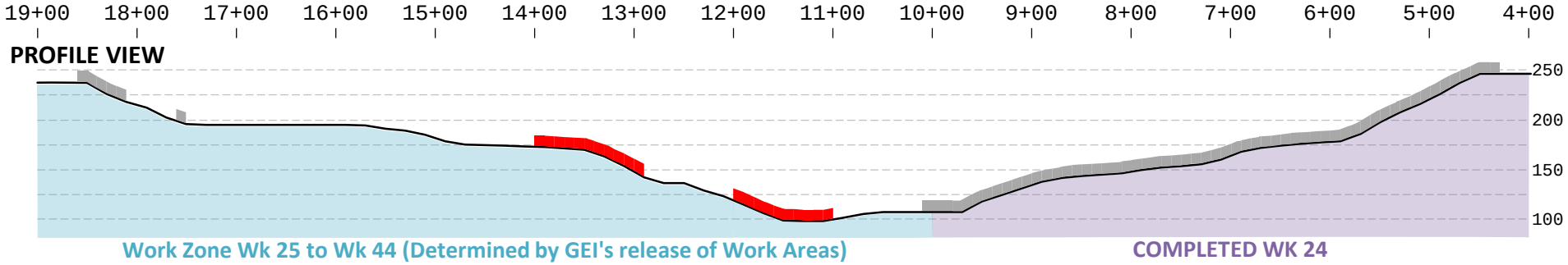
Week 26: 3/16/11 to 3/22/11

ANTICIPATED Grout Hole Drilling Sequence



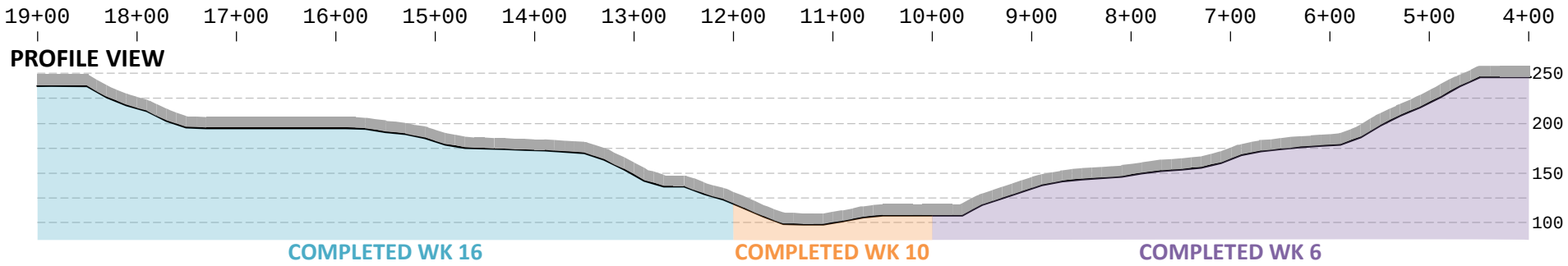
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



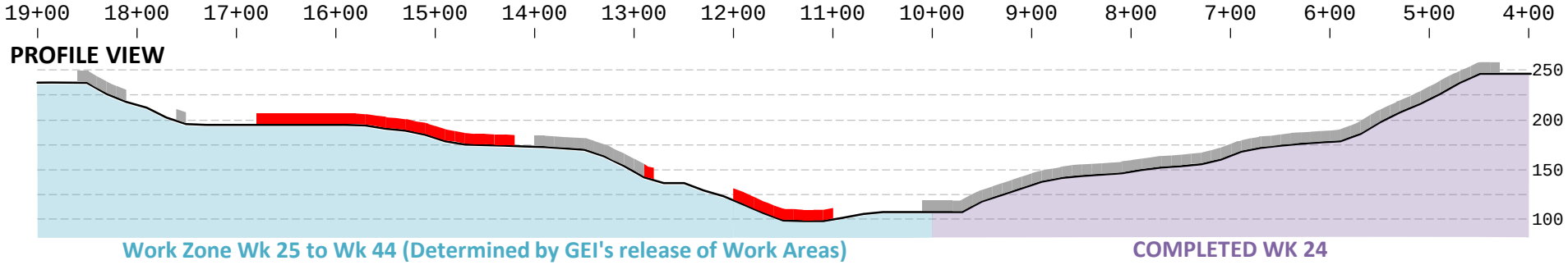
Week 27: 3/23/11 to 3/29/11

ANTICIPATED Grout Hole Drilling Sequence



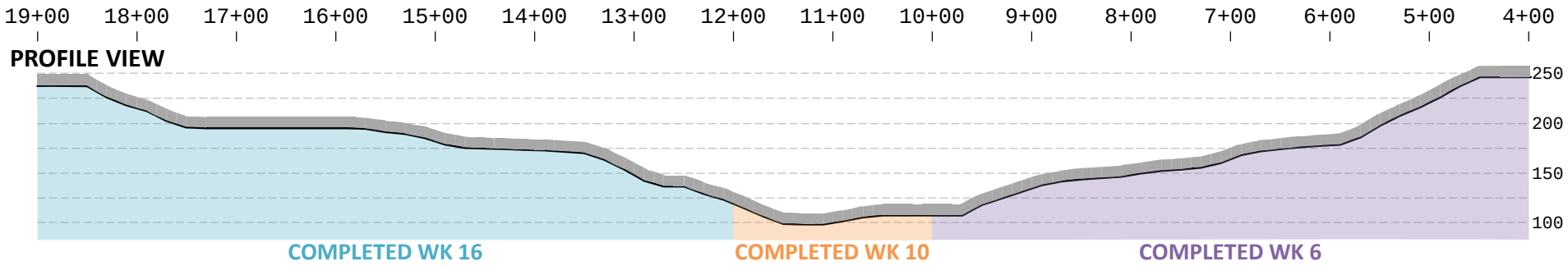
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



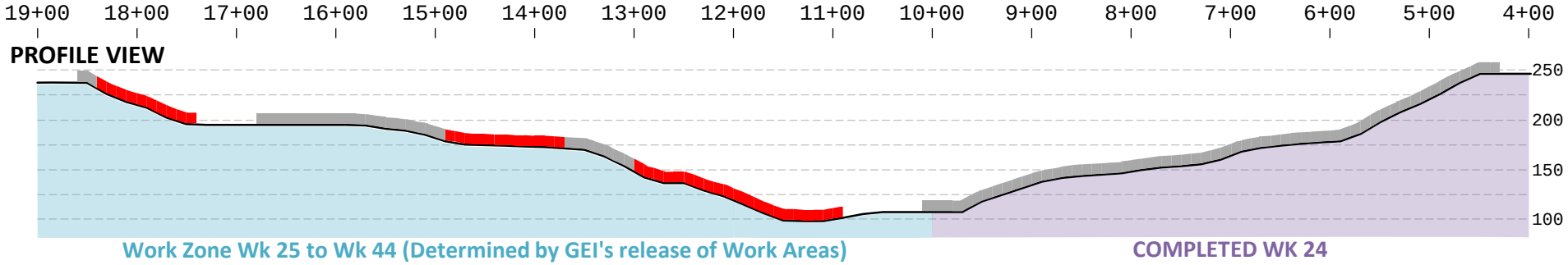
Week 28: 3/30/11 to 4/5/11

ANTICIPATED Grout Hole Drilling Sequence



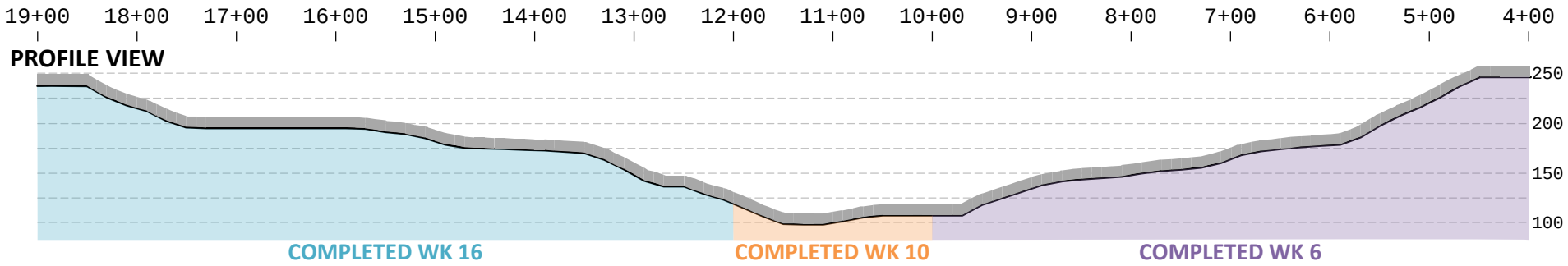
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



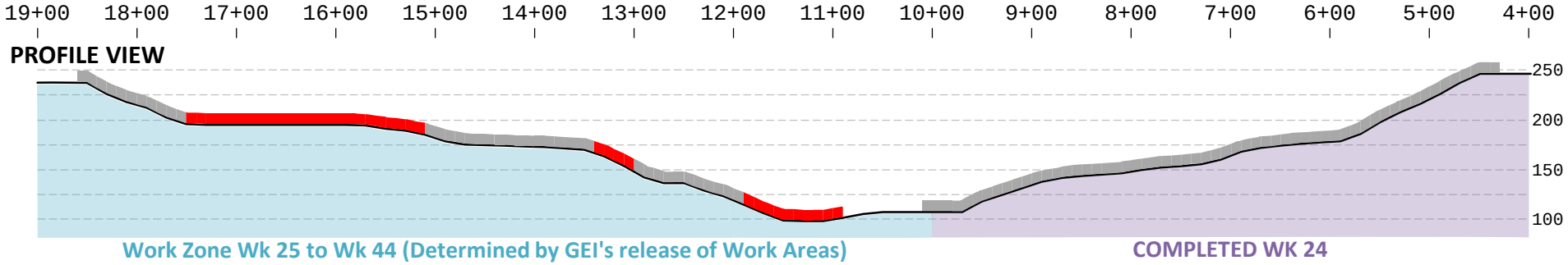
Week 29: 4/6/11 to 4/12/11

ANTICIPATED Grout Hole Drilling Sequence



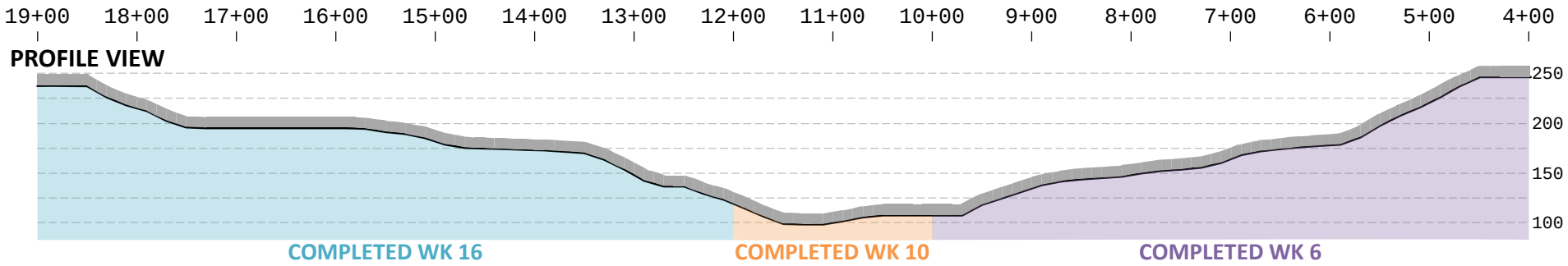
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



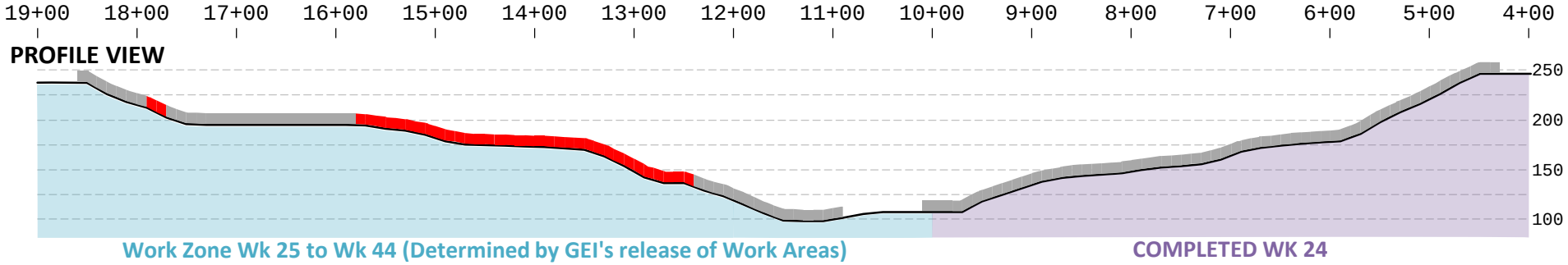
Week 30: 4/13/11 to 4/19/11

ANTICIPATED Grout Hole Drilling Sequence



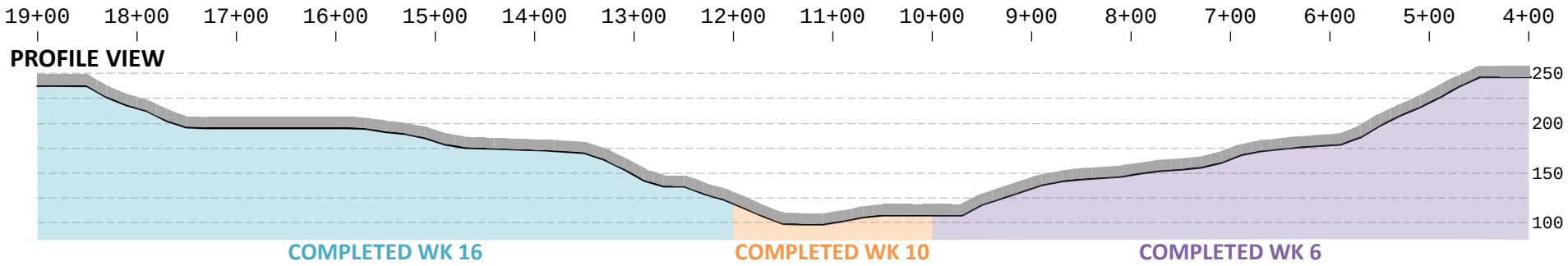
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



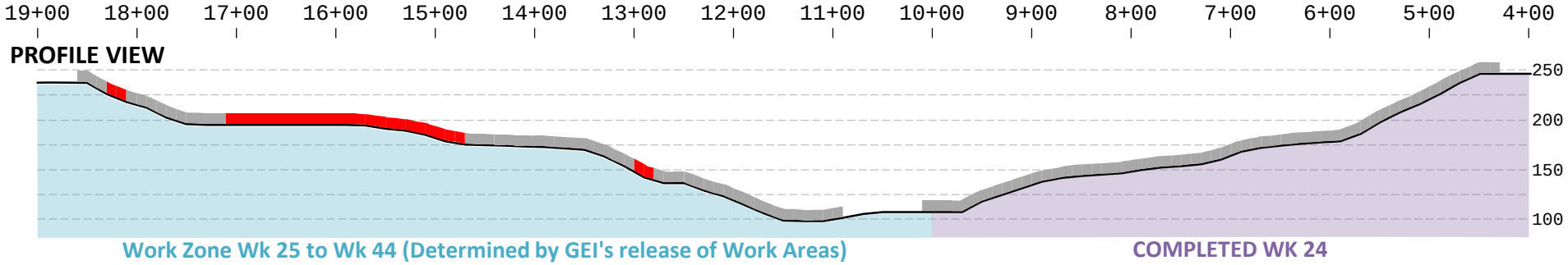
Week 31: 4/20/11 to 4/26/11

ANTICIPATED Grout Hole Drilling Sequence



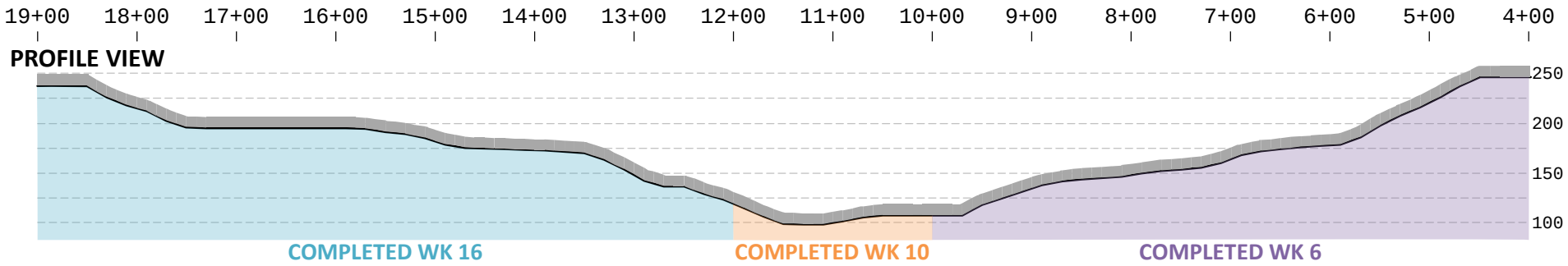
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



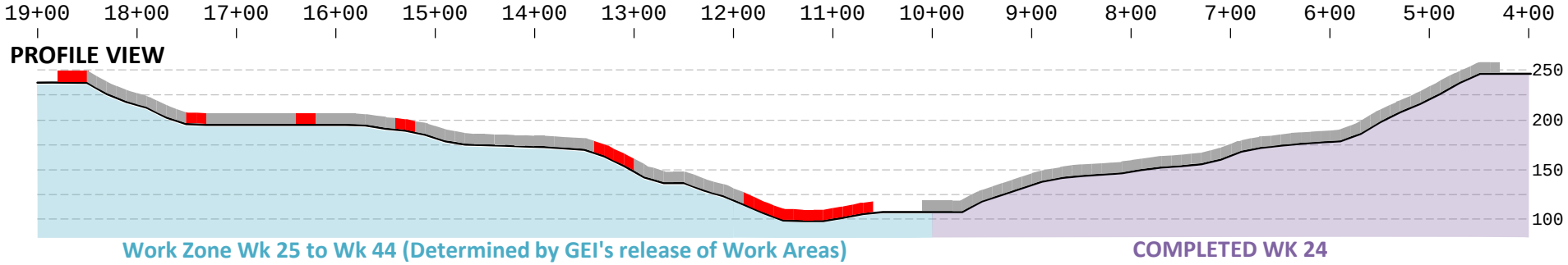
Week 32: 4/27/11 to 5/3/11

ANTICIPATED Grout Hole Drilling Sequence



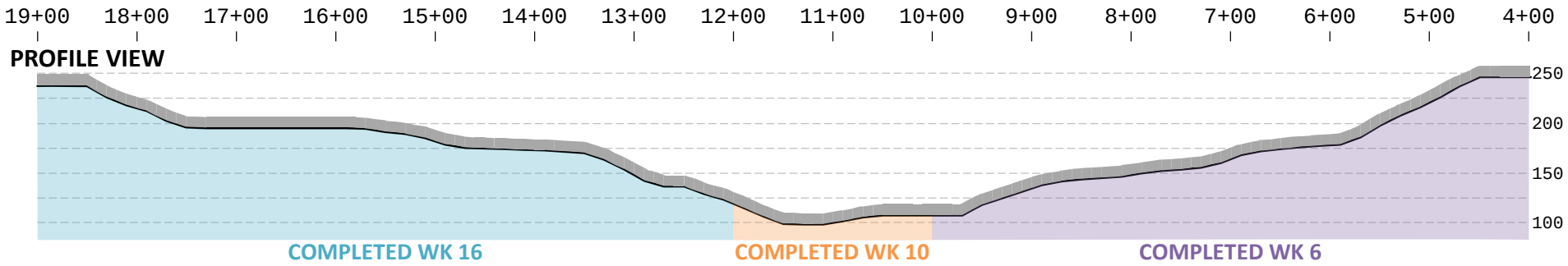
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



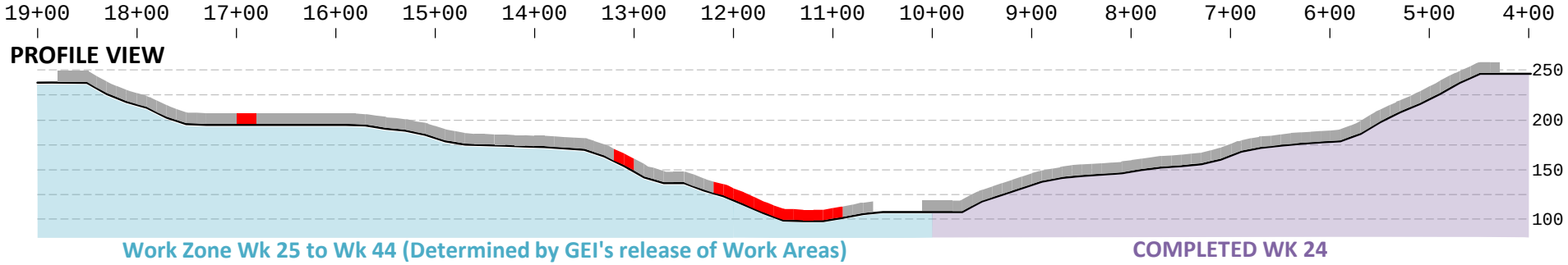
Week 33: 5/4/11 to 5/10/11

ANTICIPATED Grout Hole Drilling Sequence



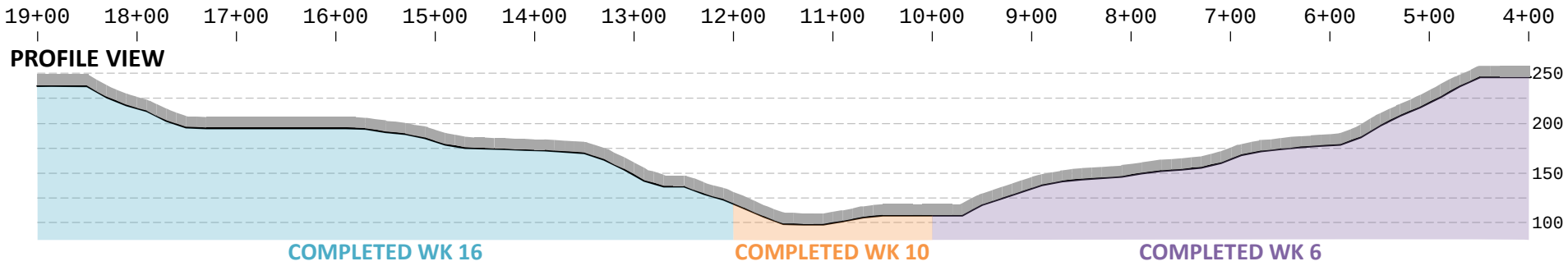
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



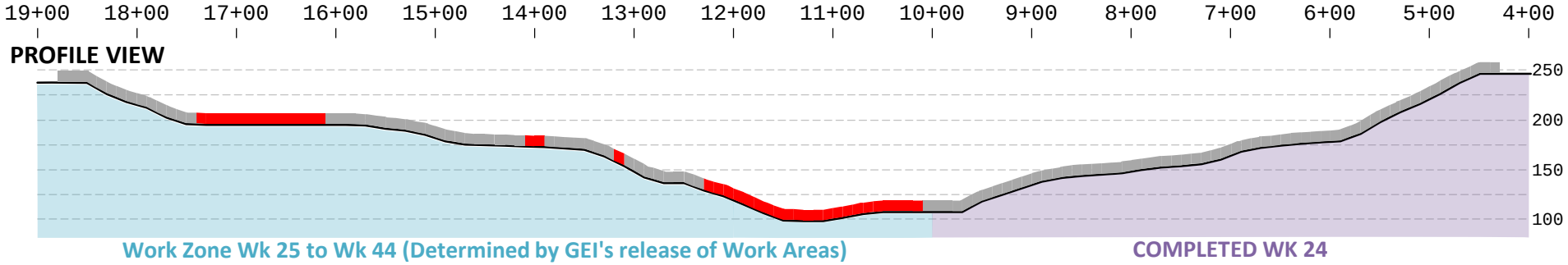
Week 34: 5/11/11 to 5/17/11

ANTICIPATED Grout Hole Drilling Sequence



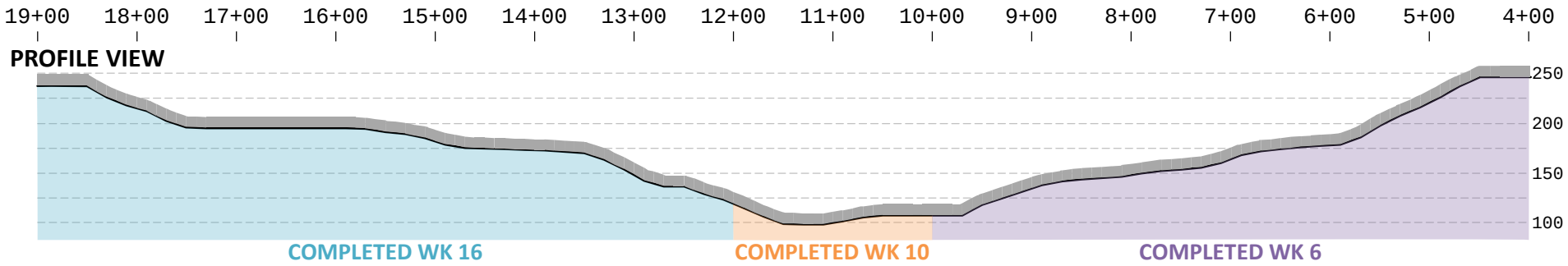
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



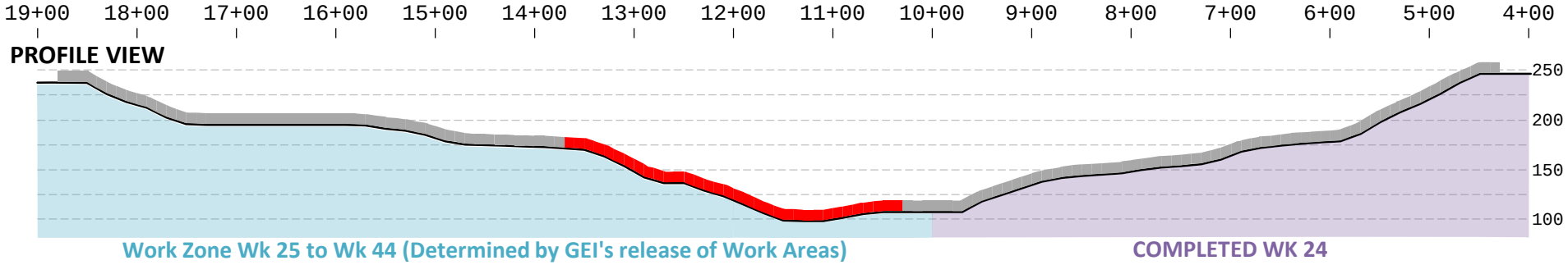
Week 35: 5/18/11 to 5/24/11

ANTICIPATED Grout Hole Drilling Sequence



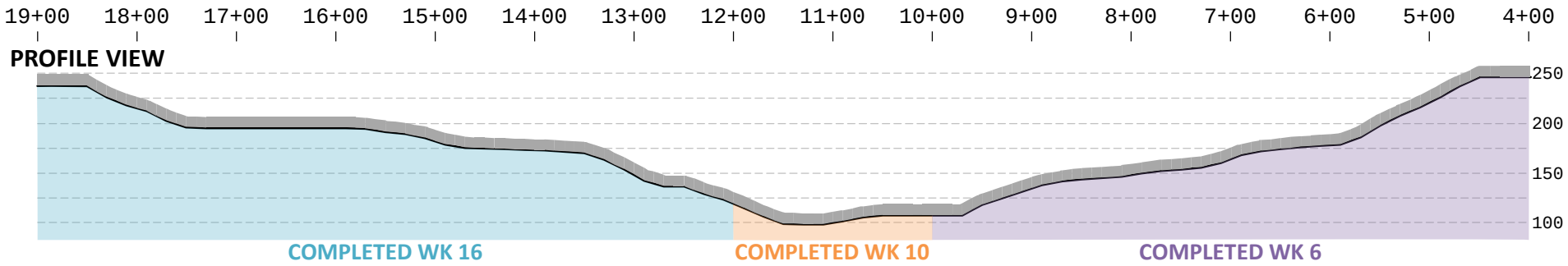
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



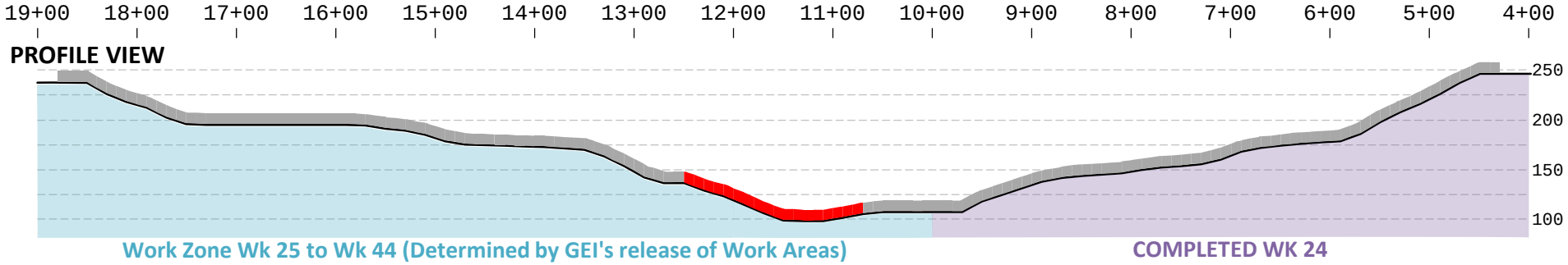
Week 36: 5/25/11 to 5/31/11

ANTICIPATED Grout Hole Drilling Sequence



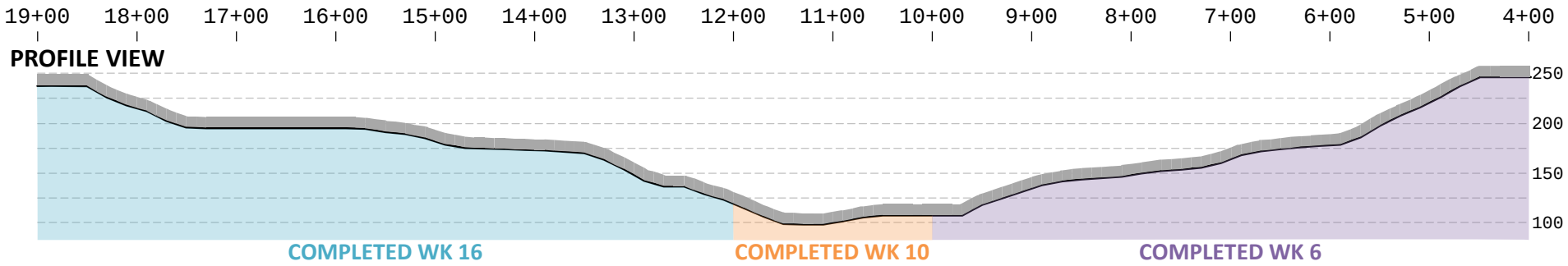
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



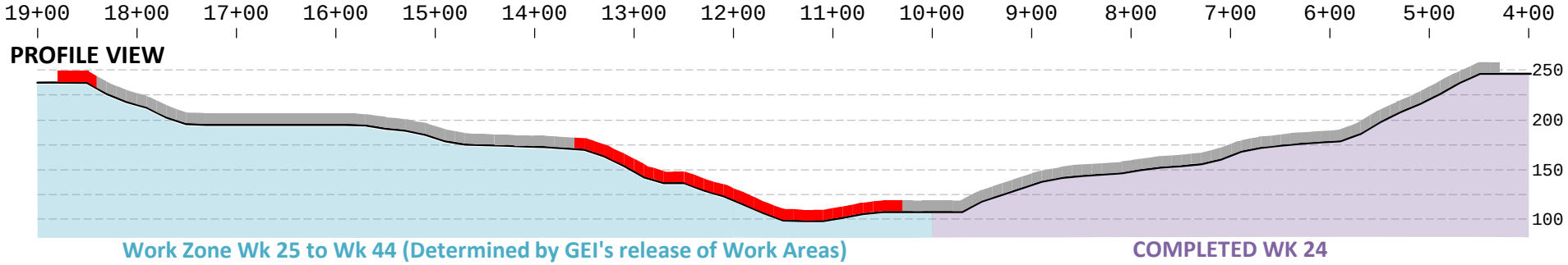
Week 37: 6/1/11 to 6/7/11

ANTICIPATED Grout Hole Drilling Sequence



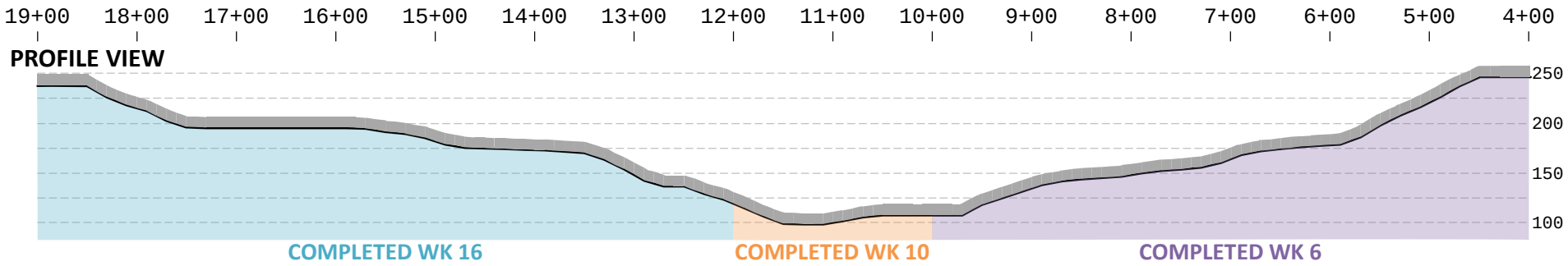
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



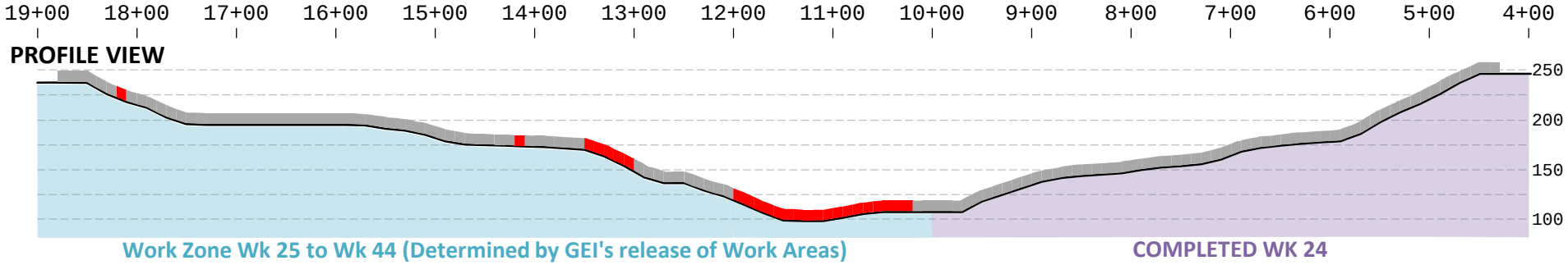
Week 38: 6/8/11 to 6/14/11

ANTICIPATED Grout Hole Drilling Sequence



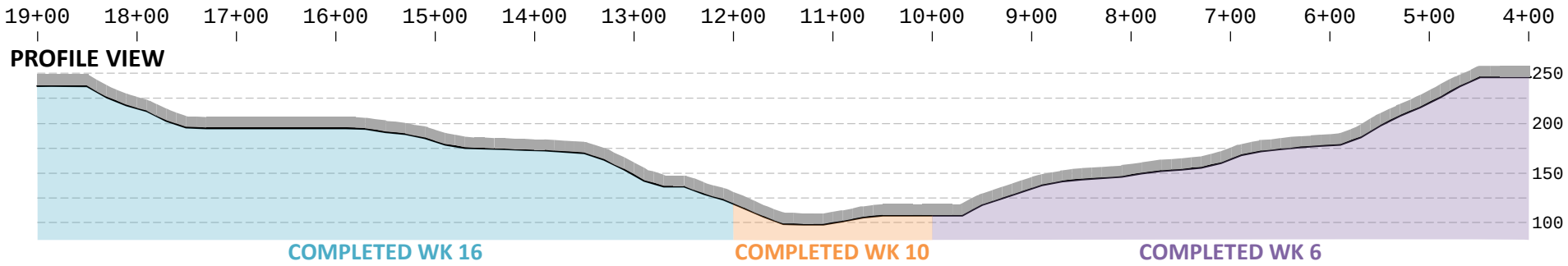
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



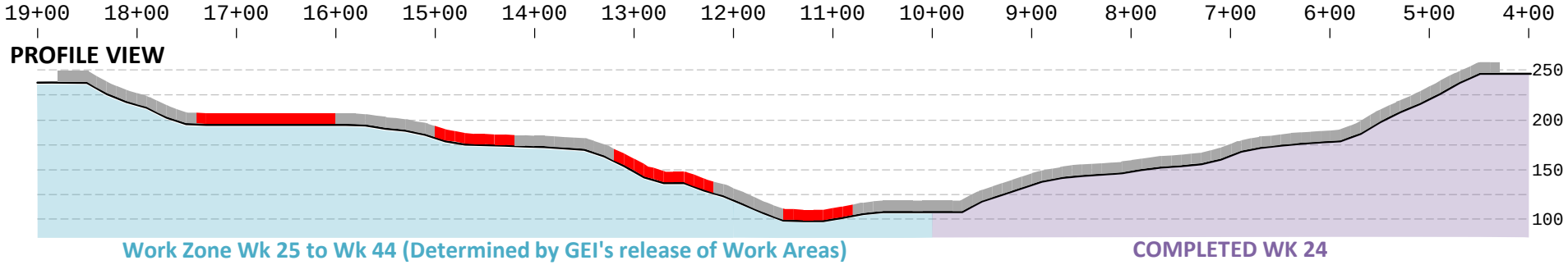
Week 39: 6/15/11 to 6/21/11

ANTICIPATED Grout Hole Drilling Sequence



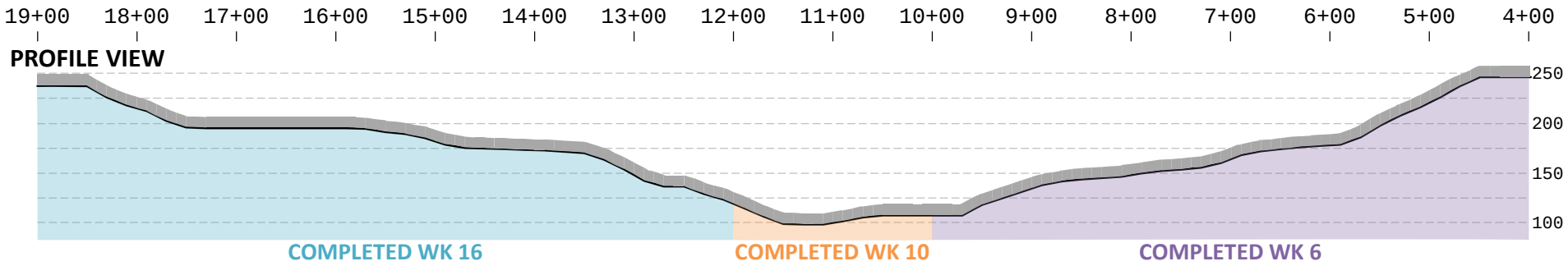
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



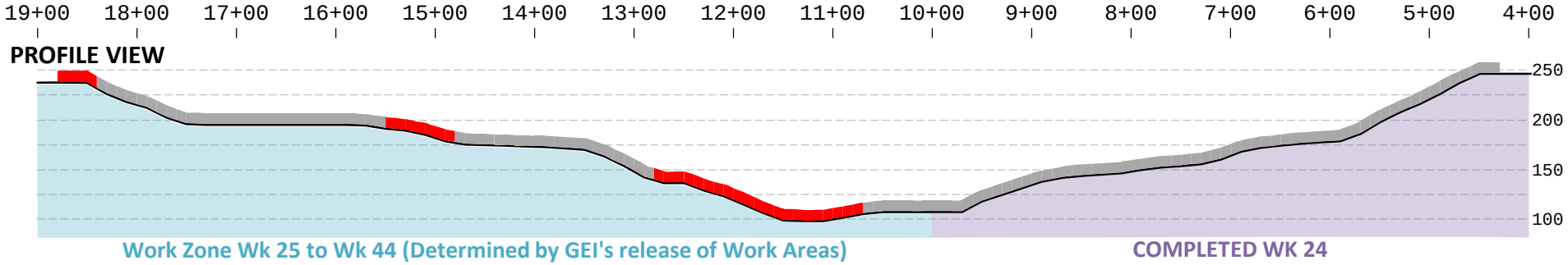
Week 40: 6/22/11 to 6/28/11

ANTICIPATED Grout Hole Drilling Sequence



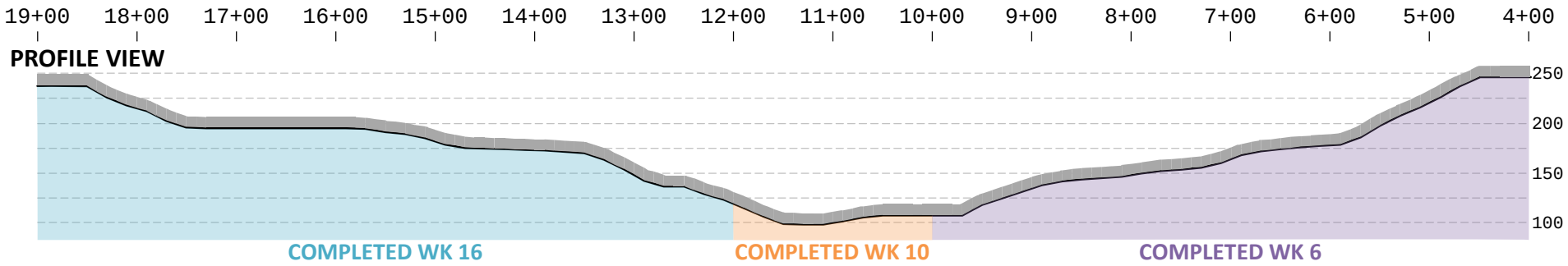
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



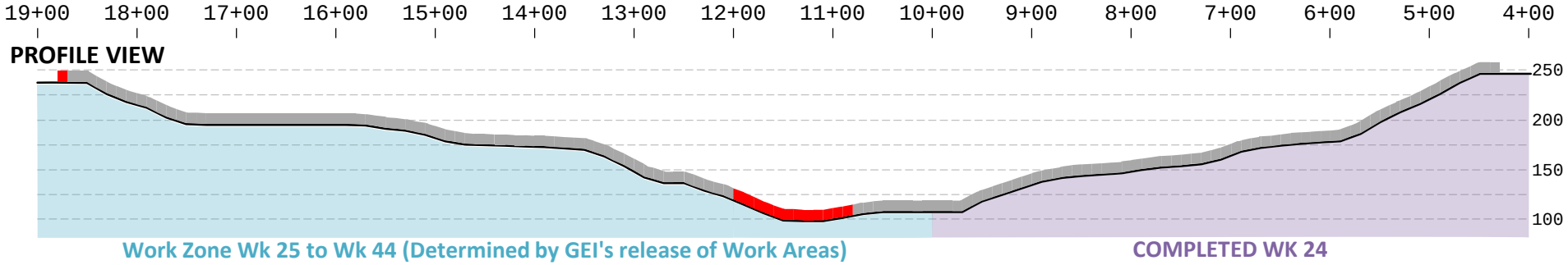
Week 41: 6/29/11 to 7/5/11

ANTICIPATED Grout Hole Drilling Sequence



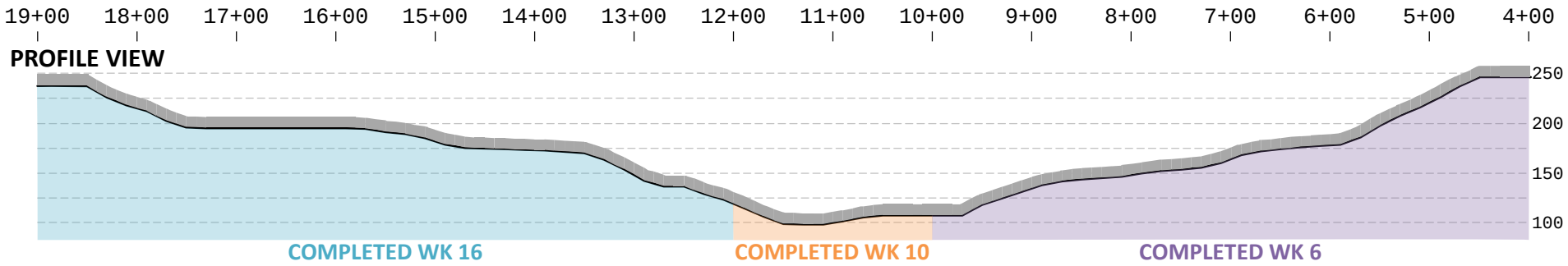
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



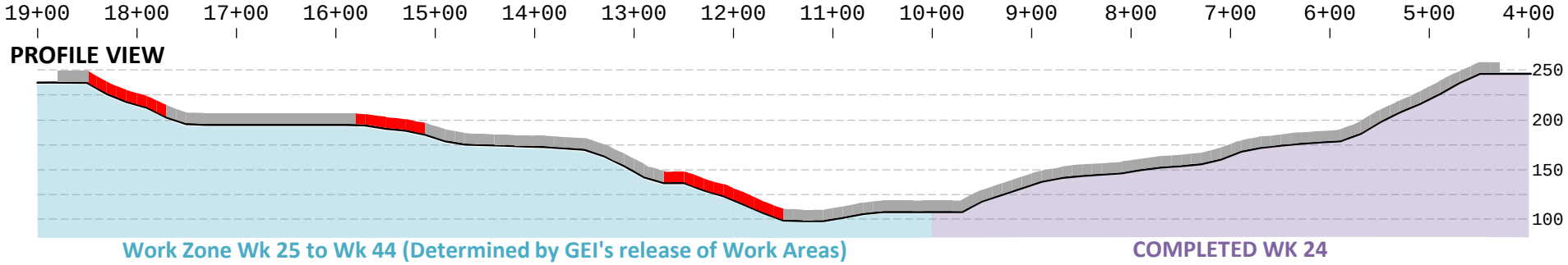
Week 42: 7/6/11 to 7/12/11

ANTICIPATED Grout Hole Drilling Sequence



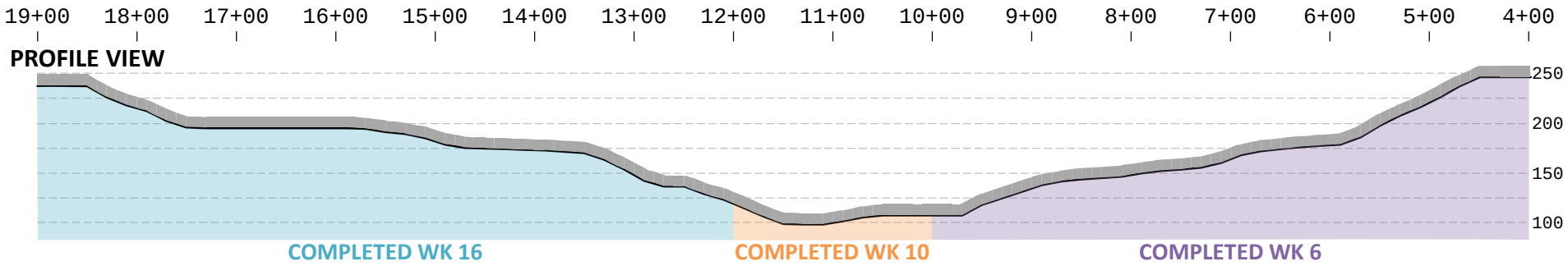
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



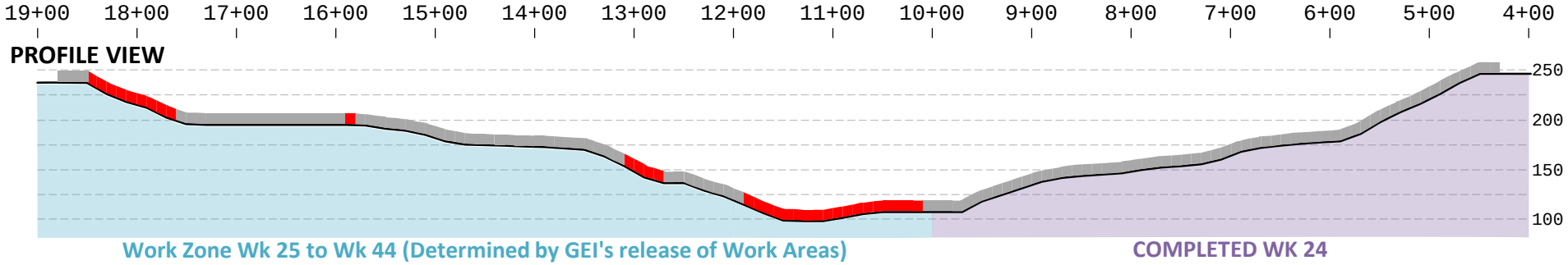
Week 43: 7/13/11 to 7/19/11

ANTICIPATED Grout Hole Drilling Sequence



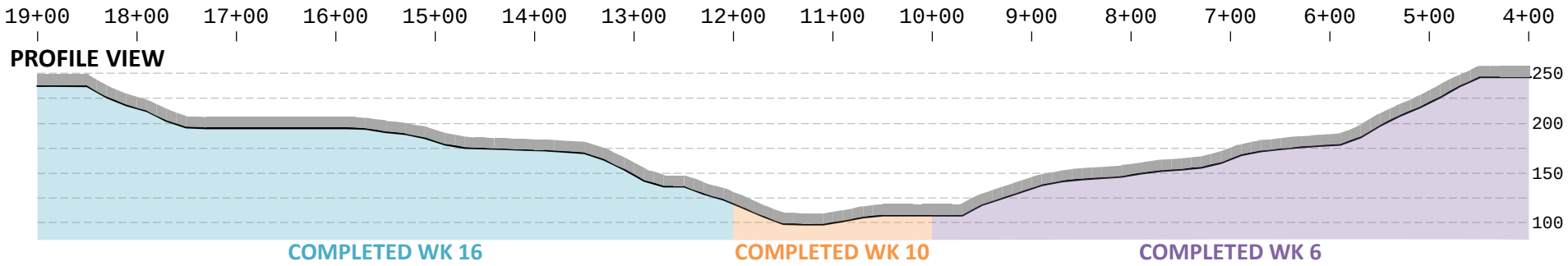
PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



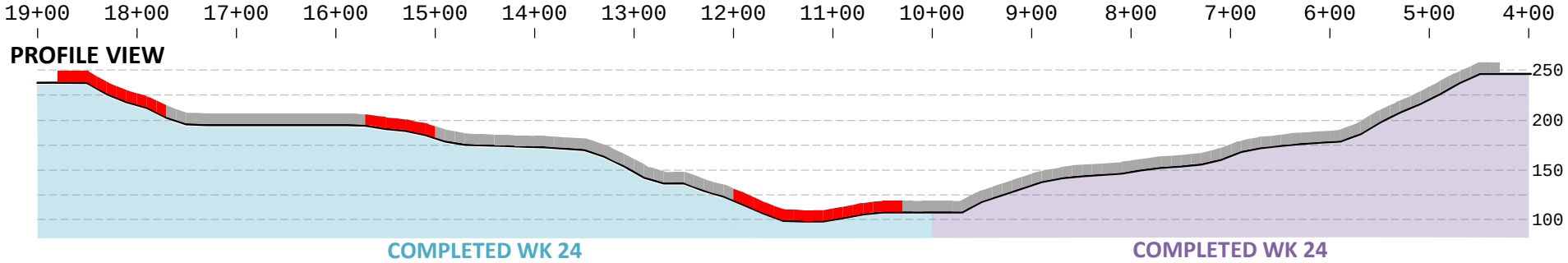
Week 44: 7/20/11 to 7/26/11

ANTICIPATED Grout Hole Drilling Sequence



PRODUCTION DRILLING 100% COMPLETE ON WK 16

AS-BUILT Grout Hole Drilling Sequence



PRODUCTION DRILLING COMPLETED ON 7/26/11:
28 WKS LATER THAN ANTICIPATED.