



TenzaOne Whitepaper

Part 5: Data Schema

Preliminary Data Schema

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Preliminary Data Schema

Tenza Project Definition and On-Going Data Constructs

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Introduction

Preliminary data schema overview, presented as a table, as required to suit both Project, Credit & SDG Verification processes and DePIN integration to enable blockchain project and credit verifications. This framework is intended as a structured set of top-level placeholders to be augmented as required to deliver to both project needs and certification requirements for reporting (see Google Drive shared Folder at for Complete Verra Documentation for VCS and SDG Certifications: https://drive.google.com/drive/folders/16rfCVtljQw-MuOt0kxf_cNUstYtjE7kF?usp=drive_link)

Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>0. Project Group</i>	0.1 Group ID	INT or UUID	Unique identifier for the project group	Primary key in ProjectGroups table	One-time creation	Project
	0.2 Group name	VARCHAR(255)	Official name of the project group	Text field in ProjectGroups table	One-time creation, rarely updated	Project
	0.3 Standard	INT (Foreign Key)	Carbon credit standard associated with the group (e.g., Verra, Gold Standard)	Foreign key to Standards table	One-time selection, may change if standard evolves	Project
	0.4 Group type	INT (Foreign Key)	Category of projects within the group	Foreign key to GroupTypes table	One-time selection, rarely changed	Project
	0.5 Group description	TEXT	Detailed explanation of the group's focus and criteria	Text field in ProjectGroups table	Initial creation, updated as needed (annually or when standards change)	Project



	0.6 SDG alignment	JSON	List of SDGs aligned with the project group	Many-to-many relationship table between ProjectGroups and SDGs	Initial setup, reviewed annually	SDGs
Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>1. Project Definition</i>	<i>1.1 Project ID</i>	INT or UUID	Unique identifier for the project	Primary key in Projects table; foreign key to ProjectGroups table	One-time creation	Project
	1.2 Project name	VARCHAR(255)	Official title of the carbon credit project	Text field in Projects table	One-time creation, rarely updated	Project
	1.3 Project type	INT (Foreign Key)	Category of project (e.g., renewable energy, reforestation)	Foreign key to ProjectTypes table	One-time selection, rarely changed	Project
	1.4 Location	POINT or separate LAT/LONG DECIMAL(10,8)	Geographical details including country, region, and coordinates	Composite field or separate fields in Projects table; potentially foreign key to Locations table	One-time entry, updated if project expands	Project
	1.5 Project developer details	INT (Foreign Key)	Information about the organization or individuals implementing the project	Foreign key to Developers table	Initial entry, updated if developer changes	Project
	1.6 Start date	DATE	Commencement date of the project	Date field in Projects table	One-time entry	Project
	1.7 Duration	INT	Expected timeline of the project in months	Integer field in Projects table	One-time entry, may be updated	Project
	1.8 Estimated emissions reduction	DECIMAL(12,2)	Projected amount of carbon emissions to be reduced or sequestered	Numeric field in Projects table	Initial estimate, may be revised annually	Project
	1.9 SDG targets	JSON	Specific SDG targets addressed by the project	Many-to-many relationship table between Projects and SDGTargets	Initial setup, reviewed annually	SDGs



	1.10 CCB Standards met	JSON	List of Climate, Community & Biodiversity Standards met by the project	Many-to-many relationship table between Projects and CCBStandards	Initial setup, updated as standards are met	Project
Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>2. Baseline Measurement</i>	2.1 Baseline scenario description	TEXT	Detailed explanation of the emissions scenario without the project	Text field in Baseline Measurements table; foreign key to Projects table	One-time creation, reviewed periodically (e.g., every 5 years)	Project
	2.2 Baseline emissions calculation methodology	INT (Foreign Key)	Method used to calculate baseline emissions	Foreign key to Methodologies table	One-time selection, updated if methodology changes	Project
	2.3 Baseline emissions data	DECIMAL(12,2)	Quantitative data on emissions in the absence of the project	Numeric fields in BaselineMeasurements table	Initial calculation, may be updated periodically (e.g., every 5 years)	Project
	2.4 SDG baseline indicators	JSON	Baseline values for relevant SDG indicators	Separate SDGBaselines table with foreign key to Projects table	Initial setup, updated periodically	SDGs

This section description is to be considered a placeholder location in the schema for all project-level Baseline data.



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>3. Project Implementation</i>	3.1 Implementation timeline	JSON or separate table	Detailed schedule of project activities and milestones	Separate Timeline table with foreign key to Projects table	Created at project start, updated regularly (monthly/quarterly)	Project
	3.2 Key milestones	VARCHAR(255) per milestone	Significant events or achievements in the project lifecycle	Milestones table with foreign key to Projects table	Added as achieved, typically several times throughout project	Project
	3.3 Technology or methods used	Many-to-many relationship	Specific technologies or methodologies employed in the project	Many-to-many relationship table between Projects and Technologies tables	Initial entry, updated if technology changes	Project
	3.4 Stakeholders involved	Many-to-many relationship	List of all parties involved in the project implementation	Many-to-many relationship table between Projects and Stakeholders tables	Initial entry, updated as stakeholders change	Project
	3.5 SDG implementation activities	JSON	Specific activities contributing to SDG targets	Separate SDGActivities table with foreign key to Projects table	Updated regularly, typically quarterly	SDGs
	3.6 CCB implementation measures	JSON	Measures taken to meet CCB Standards	Separate CCBMeasures table with foreign key to Projects table	Updated regularly, typically quarterly	Project



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>4. Monitoring and Verification</i>	4.1 Monitoring plan	TEXT	Detailed strategy for tracking project progress and emissions reduction	Text field in MonitoringPlans table; foreign key to Projects table	Created at project start, reviewed annually	Project
	4.2 Data collection methods	Many-to-many relationship	Techniques and tools used to gather project performance data	Many-to-many relationship table between MonitoringPlans and DataCollectionMethods tables	Defined at start, updated if methods change	Project
	4.3 Frequency of measurements	ENUM	How often data is collected and analyzed	Enumerated type in MonitoringPlans table	Defined at start, typically daily, weekly, or monthly	Project
	4.4 Verification body details	INT (Foreign Key)	Information about the third-party verifier	Foreign key to VerificationBodies table	Selected at project start, may change periodically	Project
	4.5 Verification dates and results	DATE and TEXT	Dates of verification activities and outcomes	Separate Verifications table with foreign key to Projects table	Typically annual or biennial, as per standard requirements	Project
	4.6 SDG monitoring indicators	JSON	Specific indicators used to track SDG progress	Separate SDGIndicators table with foreign key to Projects table	Updated regularly, typically quarterly	SDGs
	4.7 CCB monitoring protocol	TEXT	Protocol for monitoring CCB Standard compliance	Field in CCBMonitoring table; foreign key to Projects table	Created at project start, reviewed annually	Project



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
5. Carbon Credit Issuance	5.1 Number of credits issued	INT	Quantity of carbon credits generated by the project	Numeric field in CreditIssuances table	Typically annual, following verification	Credits
	5.2 Issuance date	DATE	Date when credits are officially recognized	Date field in CreditIssuances table	Typically annual, following verification	Credits
	5.3 Standard used	INT (Foreign Key)	Carbon credit standard followed (e.g., Verra, Gold Standard)	Foreign key to Standards table (should match group's standard)	Consistent throughout project, unless standard changes	Credits
	5.4 Credit serial numbers	VARCHAR(50) per credit	Unique identifiers for each credit issued	Separate Credits table with foreign key to CreditIssuances table	Generated with each issuance, typically annually	Credits
	5.5 Vintage year	INT	Year in which the emission reduction occurred	Integer field in CreditIssuances table	Annual	Credits
	5.6 SDG contribution per credit	JSON	Quantified contribution to SDG targets per credit	Field in Credits table	Calculated with each credit issuance	SDGs, Credits
	5.7 CCB certification status	ENUM	Status of CCB certification for the credits	Field in CreditIssuances table	Updated with each issuance	Credits



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
6. Credit Lifecycle	6.1 Current status	ENUM	Whether credits are active, retired, or transferred	Enumerated type in Credits table	Updated in real-time as status changes	Credits
	6.2 Retirement details	TEXT	Information about credit retirement, if applicable	Separate Retirements table with foreign key to Credits table	Recorded as retirements occur	Credits
	6.3 Transfer history	JSON or separate table	Record of ownership changes for the credits	Separate Transfers table with foreign key to Credits table	Updated in real-time as transfers occur	Credits
	6.4 SDG impact tracking	JSON	Ongoing tracking of SDG impacts linked to specific credits	Field in Credits table	Updated with each status change	SDGs, Credits



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
7. Blockchain Integration	7.1 NFT collection ID	VARCHAR(66)	Identifier for the project's NFT collection on the blockchain	Text field in BlockchainIntegrations table; foreign key to Projects table	Created once at project initiation on blockchain	Project
	7.2 Individual NFT IDs	VARCHAR(66) per NFT	Unique identifiers for each NFT representing data updates	Separate NFTs table with foreign key to BlockchainIntegrations table	Created with each data update, potentially daily/weekly	Project
	7.3 Smart contract address	VARCHAR(42)	Blockchain address of the project's smart contract	Text field in BlockchainIntegrations table	Created once at project initiation on blockchain	Project
	7.4 Blockchain network used	INT (Foreign Key)	Name of the blockchain network (e.g., Ethereum, Polkadot)	Foreign key to BlockchainNetworks table	Selected at project start, rarely changes	Project
	7.5 Timestamp of each NFT mint	TIMESTAMP	Date and time when each NFT was created	Timestamp field in NFTs table	Recorded with each NFT creation	Project
	7.6 Hash of data stored in each NFT	VARCHAR(66)	Cryptographic hash of the data contained in each NFT	Text field in NFTs table	Generated with each NFT creation	Project
	7.7 SDG data on-chain	JSON	On-chain representation of SDG-related data	Field in NFTs table	Updated with each relevant NFT creation	SDGs, Project
	7.8 CCB data on-chain	JSON	On-chain representation of CCB-related data	Field in NFTs table	Updated with each relevant NFT creation	Project

This section description is to be considered a placeholder location in the schema for all project- and credit-level Blockchain data.



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
8. Project Performance	8.1 Actual emissions reduction achieved	DECIMAL(12,2)	Measured carbon emissions reduced or sequestered	Numeric field in PerformanceMetrics table; foreign key to Projects table	Typically calculated annually	Project
	8.2 Comparison to estimated reduction	DECIMAL(5,2)	Analysis of actual vs. projected emissions reduction	Calculated field based on estimated and actual reduction	Typically calculated annually	Project
	8.3 Co-benefits	Many-to-many relationship	Additional positive impacts (e.g., social, environmental)	Many-to-many relationship table between Projects and CoBenefits tables	Assessed annually or as per project requirements	Project
	8.4 SDG performance metrics	JSON	Quantified progress towards SDG targets	Separate SDGPerformance table with foreign key to Projects table	Updated annually	SDGs
	8.5 CCB performance assessment	TEXT	Evaluation of project performance against CCB Standards	Field in CCBPerformance table; foreign key to Projects table	Updated annually	Project



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
9. Financial Data	9.1 Project costs	DECIMAL(12,2)	Total expenses associated with project implementation	Numeric field in FinancialData table; foreign key to Projects table	Updated regularly, typically monthly or quarterly	Project
	9.2 Carbon credit prices	DECIMAL(10,2)	Market value of credits generated by the project	Numeric field in FinancialData table	Updated regularly, potentially daily or weekly	Credits
	9.3 Revenue generated	DECIMAL(12,2)	Income from the sale of carbon credits	Numeric field in FinancialData table	Updated as sales occur, summarized monthly/quarterly	Project
	9.4 SDG-related investments	DECIMAL(12,2)	Funds specifically allocated to SDG-related activities	Field in SDGFinancials table; foreign key to Projects table	Updated quarterly	SDGs, Project
	9.5 CCB compliance costs	DECIMAL(12,2)	Expenses related to meeting and maintaining CCB Standards	Field in CCBFinancials table; foreign key to Projects table	Updated annually	Project



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>10. Compliance and Reporting</i>	10.1 Regulatory requirements met	Many-to-many relationship	List of compliance standards achieved	Many-to-many relationship table between Projects and RegulatoryRequirements tables	Updated as requirements are met, reviewed annually	Project
	10.2 Reporting schedules	JSON or separate table	Timetable for submitting required reports	Separate ReportingSchedules table with foreign key to Projects table	Set at project start, typically involving annual or biannual reports	Project
	10.3 Audit results	TEXT	Outcomes of any audits conducted on the project	Separate Audits table with foreign key to Projects table	Recorded as audits occur, typically annually	Project
	10.4 SDG reporting	JSON	Structured reports on SDG progress and impacts	Separate SDGReports table with foreign key to Projects table	Generated annually or as required by standards	SDGs
	10.5 CCB verification reports	TEXT	Detailed reports from CCB Standard verifications	Separate CCBReports table with foreign key to Projects table	Generated with each CCB verification, typically every 5 years	Project



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>11. DePIN and Tenza Integration</i>	11.1 DePIN data source ID	VARCHAR(50)	Unique identifier for each DePIN data source	Separate DePINSources table with foreign key to Projects table	Created when a new DePIN source is added to the project	Project
	11.2 DePIN data type	ENUM	Type of data provided by the DePIN source (e.g., temperature, humidity, energy output)	Field in DePINSources table	Defined when source is added, rarely changes	Project
	11.3 DePIN data frequency	ENUM	How often data is received from the DePIN source	Field in DePINSources table	Defined at setup, may be updated	Project
	11.4 DePIN data validation method	VARCHAR(255)	Method used to validate data from DePIN sources	Field in DePINSources table	Defined at setup, may be updated as validation methods evolve	Project
	11.5 Tenza platform integration ID	VARCHAR(50)	Unique identifier for the project's integration with Tenza platform	Field in TenzaIntegrations table; foreign key to Projects table	Created once at project initiation on Tenza platform	Project
	11.6 Tenza data mapping	JSON	Mapping of project data fields to Tenza platform fields	Field in TenzaIntegrations table	Initial setup, updated if data structure changes	Project
	11.7 Tenza update frequency	ENUM	How often project data is synced with Tenza platform	Field in TenzaIntegrations table	Defined at setup, may be adjusted	Project



	11.8 Oracle service used	VARCHAR(255)	Name or identifier of the oracle service used for external data verification	Field in BlockchainIntegrations table	Selected at project start, may change if oracle service changes	Project
	11.9 Oracle data points	JSON	List and description of data points verified by the oracle service	Field in BlockchainIntegrations table	Initial setup, updated as verified data points change	Project
	11.10 Smart contract update triggers	JSON	Conditions that trigger updates to the project's smart contract	Field in BlockchainIntegrations table	Defined at setup, may be updated as project evolves	Project
	11.11 Off-chain data storage method	VARCHAR(255)	Method or service used to store data off-chain (e.g., IPFS, Filecoin)	Field in BlockchainIntegrations table	Selected at project start, may change if storage method changes	Project
	11.12 Interoperability protocol	VARCHAR(255)	Protocol used for interoperability between different blockchains (if applicable)	Field in BlockchainIntegrations table	Selected if project uses multiple chains, updated if protocol changes	Project
	11.13 Governance token	VARCHAR(50)	Identifier of the governance token used for project decisions (if applicable)	Field in BlockchainIntegrations table	Created if project uses a governance model, rarely changes	Project
	11.14 Token economics model	JSON	Description of the token economics model for the project	Field in BlockchainIntegrations table	Defined at project start, may be updated as model evolves	Project



	11.15 Regulatory compliance checks	JSON	List of regulatory checks performed for DePIN and blockchain aspects	Many-to-many relationship table between Projects and RegulatoryChecks tables	Updated as new regulations emerge or compliance is verified	Project
	11.16 DePIN SDG data collection	JSON	Specific SDG-related data collected through DePIN sources	Field in DePINSources table	Updated with each data collection cycle	SDGs
	11.17 Tenza SDG reporting integration	JSON	Mapping of SDG data to Tenza platform reporting structure	Field in TenzaIntegrations table	Initial setup, updated as reporting requirements change	SDGs
	11.18 Blockchain-based SDG verification	JSON	On-chain verification mechanisms for SDG-related claims	Field in BlockchainIntegrations table	Updated with each verification cycle	SDGs
	11.19 CCB data integration with DePIN	JSON	Mapping of CCB-related data to DePIN sources	Field in DePINSources table	Initial setup, updated as CCB requirements change	Project
	11.20 Tenza CCB compliance tracking	JSON	Integration of CCB compliance data with Tenza platform	Field in TenzaIntegrations table	Updated with each CCB assessment or verification	Project

This section description is to be considered a placeholder location in the schema for all project-level DePIN reporting data



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>12. Historical Data</i>	12.1 Historical Record ID	INT or UUID	Unique identifier for the historical record	Primary key in HistoricalRecords table	One-time creation	Project Management
	12.2 Project ID	INT or UUID (Foreign Key)	Unique identifier for the project	Foreign key to Projects table	One-time creation	Project Management
	12.3 Record Date	DATE	Date of the historical record	Date field in HistoricalRecords table	One-time entry, updated if necessary	Reporting
	12.4 Emissions Data	DECIMAL(12,2)	Historical emissions data	Numeric field in HistoricalRecords table	Periodic updates (e.g., annually)	Environmental Compliance
	12.5 Methodology Used	INT (Foreign Key)	Method used to collect historical data	Foreign key to Methodologies table	One-time selection, updated if methodology changes	Methodology Standards
	12.6 SDG Historical Indicators	JSON	Historical values for relevant SDG indicators	Separate SDGHistoricalIndicators table with foreign key to Projects table	Initial entry, updated periodically	SDG Compliance
	12.7 Historical Context Description	TEXT	Detailed explanation of the historical context	Text field in HistoricalRecords table	One-time creation, updated as needed	Reporting
	12.8 Compliance Records	JSON	Records of compliance with regulatory standards over time	JSON field in HistoricalRecords table	Initial entry, updated as needed	Regulatory Compliance



Category	Element	Data Type and Size	Description	Data Storage and Relationships	Timing and Frequency	Area of Compliance
<i>13. Preliminary Survey Data</i>	13.1 Survey ID	INT or UUID	Unique identifier for the survey	Primary key in Surveys table	One-time creation	VCS, CCB
	13.2 Project ID	INT or UUID (Foreign Key)	Unique identifier for the project	Foreign key to Projects table	One-time creation	VCS, CCB
	13.3 Survey Date	DATE	Date the survey was conducted	Date field in Surveys table	One-time entry, updated if necessary	VCS, CCB
	13.4 Project Definition	JSON	Information about the project definition	JSON field in Surveys table	One-time entry, updated as needed	Project Compliance
	13.5 Project Group	JSON	Information about the project group	JSON field in Surveys table	One-time entry, updated as needed	Group Compliance
	13.6 Customer Information	JSON	Information about the customer	JSON field in Surveys table	One-time entry, updated as needed	Customer Compliance
	13.7 Site Information	JSON	Detailed information about the site	JSON field in Surveys table	One-time entry, updated as needed	Site Compliance
	13.8 Site Data	JSON	Data about the site including size, topography, and climate conditions	JSON field in Surveys table	One-time entry, updated as needed	Environmental Compliance
	13.9 Electrical Infrastructure	JSON	Details about the electrical infrastructure	JSON field in Surveys table	One-time entry, updated as needed	Electrical Compliance
	13.10 Potential Hazards	JSON	Information about potential hazards at the site	JSON field in Surveys table	One-time entry, updated as needed	Safety Compliance
	13.11 Additional Documents	JSON	Permits, blueprints, utility	JSON field in Surveys table	One-time entry, updated as needed	Documentation Compliance



			bills, and photographs			
	13.12 Survey Findings	JSON	Detailed findings from the survey	JSON field in Surveys table	One-time entry, updated as needed	Reporting
	13.13 Historical Data Collected	JSON	Historical data collected during the survey	JSON field in Surveys table	One-time entry, updated as needed	Historical Compliance
	13.14 Baseline Data Collected	JSON	Baseline data collected during the survey	JSON field in Surveys table	One-time entry, updated as needed	Baseline Compliance
	13.15 SDG Survey Indicators	JSON	Survey values for relevant SDG indicators	Separate SDGSurveyIndicators table with foreign key to Projects table	Initial entry, updated periodically	SDG Compliance
	13.16 Survey Context Description	TEXT	Detailed explanation of the survey context	Text field in Surveys table	One-time creation, updated as needed	Reporting
	13.17 Compliance Verification	JSON	Verification of compliance with regulatory standards during the survey	JSON field in Surveys table	Initial entry, updated as needed	Regulatory Compliance



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